COLLEGE OF ENGINEERING AND TECHNOLOGY,
BAMBHORI POST BOX NO. 94, JALGAON – 425001. (M.S.)

NBA Accredited

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Mandatory Disclosure

Part-III

January 2013

Shram Sadhana Bombay Trust's
COLLEGE OF ENGINEERING AND TECHNOLOGY,
BAMBHORI POST BOX NO. 94, JALGAON – 425001. (M.S.)
Included under section 2 (f) & 12 (B) of the UGC Act, 1956
with NBA Accredited courses & ISO 9001 : 2008 certified
ISO 9001:2008

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Principal: Dr. K.S.Wani
M. Tech, DBM, Ph.D.

Ref. No. COET/AICTE/MD/ / 13 **Date:**

C E R T I F I C A T E

Certified that all enclosures contained in PART-I , PART-II & PART-III bearing page no. **01** to page no. **1207** are pertaining to our institution which are being submitted in two separate above mentioned bound booklets/box file of Mandatory Disclosure. All xerox copies may be treated as original.

PRINCIPAL

NORTH MAHARASHTRA UNIVERSITY, JALGAON
STRUCTURE OF TEACHING AND EVALUATION
S.E.(ELECTRONICS & Communication / electronics & Telecommunication / electronics)

First term

W.E.F. 2006-07

Sr. No.	Subject	Teaching Scheme Hours/week			Examination Scheme				
		Lectures	Tutorial	Practical	Paper Duration Hours	Paper	TW	PR	OR
1	Electronics Materials and Components	4	--	--	3	100	25	--	--
2	Electronics Instrumentation	4	--	2	3	100	25	25	--
3	Digital Circuits and Logic Design	4	--	2	3	100	25	25	--
4	Electrical Circuits and Machines	4	--	2	3	100	25	--	--
5	Semiconductor Devices and Circuits	4	--	4	3	100	25	50	--
6	Electronics Workshop	--	--	2	--	--	25	--	--
	Total	**20**	**--**	**12**	**--**	**500**	**150**	**100**	**--**
	Grand Total	**32**			**750**				

SECOND TERM

Sr. No.	Subject	Teaching Scheme Hours/week			Examination Scheme				
		Lectures	Tutorial	Practical	Paper Duration Hours	Paper	TW	PR	OR
1	Management Science	4	--	--	3	100	--	--	--
2	Electronic Circuits and Applications	4	--	4	3	100	25	50	--
3	Engineering Mathematics-III	4	1	--	3	100	25	--	--
4	Network and Lines	4	1	2	3	100	25	25	--
5	Analog Communication	4	--	2	3	100	25	50	--
6	Software Application-I	--	--	2	--	--	25	--	--
	Total	**20**	**2**	**10**	**--**	**500**	**125**	**125**	**--**
	Grand Total	**32**			**750**				

NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 -2007
TERM - I
ELECTRONICS MATERIALS AND COMPONENTS

Teaching scheme:
Lectures : 4 hrs/week

Examination scheme:
Theory Paper : 100 Marks (3 Hours).
Term Work : 25 Marks

UNIT – I

Electrical conducting materials, Copper, Aluminum, Tungsten, Carbon and Graphite, Nickel, Lead, Tin-Alloys, properties and applications; Insulating materials, Mica, porcelain, Marble and Slate, Polythene, Bakelite, Polyvinyl chloride, Asbestos, Rubber, Cotton and Silk, Glass, Paper and Boards, Wood, Enamel covering, Semiconductor materials-Classification of semiconductors;-Elemental semiconductors-Antimony, Arsenic .Selenium. Gallium Silicon and Germanium, Compound Semiconductors -GaAs. Amorphous semiconductor:-Ge, Si, Se, Te, properties and applications; Magnetic materials:-Soft magnetic materials, Electrical steels, Hard magnetic materials, Magnetic recording, magnetic memories. Metallic glasses. Dielectric materials:-Capacitor structure, Multi layer capacitor dielectric . Lead Zirconate Titanate (LZT), PLZT system.

Lectures-10, Marks -20

UNIT – II

Passive components: Resistors: - Fixed type, carbon composition, carbon film, metal film: construction and characteristics; Variable resistors, carbon potentiometer, and wire-bound potentiometer: construction and characteristics. Tolerance of various resistors. Capacitors: - fixed type, electrolytic, aluminium type, tantalum type, ceramic capacitors, polystyrene, polyester capacitors, mica capacitor and paper capacitor, variable capacitor: construction and properties of each type. Inductors: - fixed type, air-core, ferrite-core inductors and variable inductors: construction and characteristics. Transformers:-Construction, Operation and types- power transformer, IF, AF and RF. Losses in transformers-Core losses, Eddy current Losses, Residual Losses Applications.

Lectures-10, Marks -20

UNIT - III

Discrete devices: Fabrication of discrete and monolithic devices, Semiconductor processing:-Zone refining Mono crystallization, Floating Zone method, vaferization. Diodes:- alloy junction, Crystals, Grown junctions, Solid diffusion, and Gaseous diffusion. Epitaxial diodes. Point contact diode, Schottky barrier diode, Zener diodes, power diodes, Tunnel diodes. Light emitting diodes. BJT Fabrication:-Alloy junction, Point contact, Diffusion, Power transistors,. junction, Diffused junction and Epitaxial techniques, JFET; Fabrication:-MOSFET Fabrication, Depletion MOSFET- Enhancement – MOSFET, C-MOS. V-MOS. Alloy junction, Diffused junction and Epitaxial techniques .UJT Fabrication, Pellet type SCR, Annular SCR, DIAC Fabrication,

Lectures-10, Marks -20

UNIT –IV

Fabrication of Optoelectronic Devices: LDR Phototransistor, LASCR, SUS, LCD, Seven segment displays.
Integrated circuits: Monolithic integrated circuits, chip and component size, photolithographic masking, fabrication: IC resistors, capacitors, diodes and transistors; fabrication of epitaxial- diffused integrated circuits. Thermo-compressic bonding of lead and packaging of ICs.

Lectures-10, Marks -20

UNIT –V

Printed Circuit Boards: Base and conducting materials, artwork, copper clad laminates: properties and types, Design rules for analog circuit PCBs, Design rules for PCBs in power electronics application, Design rules for PCBs in microwave application, photographic etching techniques, mass-soldering techniques, mounting of components, final protection, multilayered flexible PCB.

Lectures-10, Marks -20

REFERENCES:

1. C.S. Indulkar, S.Thiruvengadam: An Introduction to Electrical Engineering Materials, S Chand & Company. 3/e
2. Salivahanan, Suresh Kumar, Vallavaraj : Electronic Devices and Circuits, TMH publication.
3. Allison: Electronic Engineering Materials and Devices, TMH publication.
4. W. Bosshart : Printed Circuit Boards: Design and Fabrication, TMH publication.
5. S.M. Dhir: Electronic components & materials

Note: The term work should include minimum FIVE assignments based on above syllabus, ONE from each unit.

NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 -2007
TERM - I
ELECTRONICS INSTRUMENTATION

Teaching scheme:
Lectures : 4 hrs/week
Practicals : 2 hrs/week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)
Term Work : 25 Marks
Practical : 25 Marks

UNIT – I

Measurement and error : Definitions, instruments, accuracy, precision, sensitivity , resolution error, accuracy and precision , significant figures, types of error , gross error, systematic error, random error, statistical analysis, arithmetic mean, average deviation, standard deviation, probable error and limiting errors.

Units of measurement: Fundamental and derived units, systems of unit - CGS, MKS and SI. Standards of measurement: Classification of standards, international standards, primary standard, secondary standard, working standard, IEEE standards.

Calibration – Primary calibration , Secondary Calibration, Indirect Calibration, Routine Calibration, Fundamentals elements of Measurement System.

Lectures-10, Marks -20

UNIT – II

Electromechanical Indicating Instruments : Permanent magnet moving coil mechanism (PMMC) , D'Arsonal movement , multirange DC ammeter , multirange DC volt meter sensitivity , loading effect , voltmeter - ammeter methods of measuring resistance , series type ohm meter, shunt type ohm meter, multimeter, calibration of DC instruments , AC indicating instruments , electrodynamometer , rectifier type instruments , typical multimeter circuits, electrodynamometer in power measurements, single phase watt meter , watt –hour-meter, power factor meter. Lectures-10, Marks -20

UNIT – III

Bridges and their applications : Wheatstone bridge, measurement errors, sensitivity, Kelvin bridge, guarded wheatstone bridge, Mega ohm bridge, AC bridge, conditions for bridge balance, inductance comparison bridge, capacitance comparison bridge, maxwell bridge, Hay bridge, Schering bridge, Wein bridge, Wagner ground connections. Lectures-10, Marks -20

UNIT – IV

Electronic instruments: Electronic dc and ac voltmeter, electronics multimeter, digital voltmeter - ramp type, Integration continuous balance and successive approximation type.

Recorders : Galvanometric, servo potentiometer, magnetic and digital data recording, printers.

Lectures-10, Marks -20

UNIT – V

Transducers and application: characteristic and applications of Strain gauges, capacitive transducer, Inductive transducer, linear variable differential transformer (LVDT), potentiometric transducer, thermister, thermocouple, thermostat ,Acoustical transducers - microphone, speakers., Instrumentation amplifier, RTD, pressure transducer, flow transducer, pyrometer, luxmeter. Lectures-10, Marks -20

REFERENCES:

1) Cooper & Helfric : Electronics Instrumentation & measurement technique, Pearson LPE
2) H.S. Kalsi : Electronics Instrumentation, TMH 2/e
3) A.K.Sawhney: Electrical and Electronics measurement and Instrumentation, Dhanpat Rai and compony.

LIST OF EXPERIMENTS:-

Group A

1) (a) Study of single phase wattmeter.
   (b) Study of single phase watt hour meter.
2) Study of Wheat stone bridge
3) Study of Kelvin bridge
4) Study of Maxwell bridge
5) Study of Hay bridge
6) Study of Schering bridge

Group B

7) Study of Wein bridge
8) Study of digital voltmeter
9) Study of Recorder
10) Study of Instrumentation amplifier
11) Study of Linear variable differential transformer
12) Application of thermistor for temperature control

The term work should include a minimum EIGHT experiments. FOUR from group A and FOUR from group B .

NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 -2007
TERM - I
DIGITAL CIRCUITS AND LOGIC DESIGN

Teaching scheme:
Lectures : 4 hrs/week
Practicals : 2 hrs/week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)
Term Work : 25 Marks
Practical : 25 Marks

UNIT – I

Characteristics of digital IC's , TTL, Schottkey TTL , ECL, Interfacing ECL and TTL, MOS Logic, CMOS Logic, Interfacing of CMOS and TTL.
Loading rules for logic families, switching times, digital signals, positive and negative logic

Lectures-10, Marks -20

UNIT – II

Binary arithmetic, Signed binary numbers, Binary codes : Exess-3, Gray, BCD, ASCII , parity bit, hamming code .Boolean algebra, Demorgan's theorems , Minimization of logic functions using K-map, Canonical forms, min terms, max terms, don't care conditions, variable entered mapping (VEM) , code converters Lectures-10, Marks -20

UNIT – III

Combinational Logic Circuits Design: Arithmetic circuits, half and full adder, half and full subtractor, binary parallel adder, 7483, BCD adder, BCD subtractor, Excess-3 adder, digital comparator, Multiplexers, Demultiplexers, decoders, Arithmetic logic unit (ALU – 74181), Carry look ahead generator.

Lectures-10, Marks -20

UNIT – IV

Sequential logic circuits : Flip flops (SR, JK, MSJK, D, T), excitation table, design of ripple counter using flip flop and IC's, 4- bit Up / Down ripple counter, shift register, universal register and application

Lectures-10, Marks -20

UNIT – V

Synchronous Sequential Machine: Synchronous counters, Mod- N counter, synchronous counters using 74191, design of Sequential generator. Moore Mealy machines, state diagram, state table, application to sequential generator, Introduction to array

Lectures-10, Marks -20

REFERENCES:

1. R.P. Jain : Modern digital electronics , TMH 3/e
2. Morris Mano : Digital logic and computer design, Pearson LPE
3 Macrovitz : Introduction to logic design . TMH 2/e
4 Taub and Schilling : Digital integrated electronics, Mc Graw Hill
5 Gothman : Digital electronics : An Introduction to Theory & Practice, PHI 2/e
6. William Fletcher : Engineering approach to Digital design, PHI
7. Givone : Digital principles and Design , TMH
8. Malvino , Leach : Digital principle and Applications

LIST OF EXPERIMENTS

GROUP - A

1. Design and implement circuit using NAND or NOR gate to perform the Boolean expression
2. Design and implement BCD to Exess-3 code converter
3. Design and implement 4- bit binary to Gray code converter
4. Implement 4-bit binary adder using IC 7482 and IC 7483
5. Implement BCD to 7- segment decoder using IC 7447/7448
6. Implement BCD adder using 7483
7. Implement 4 – bit comparator using IC 7485
8. Implement arithmetic logic unit using IC 74181

GROUP – B

1. Verify the truth table of multiplexer and demultiplexer ICs
2. Implement the logical expression using multiplexer IC and gates
3. Implement the logical expression using demultiplexer IC and gates
4. Implement and verify S-R, J-K,D, and T flip flop using ICs
5. Implement 4- bit ripple counter using IC 7493
6. Design and Implement Mod -6 synchronous counter
7. Implement decade up- down counter using ICs
8. Implement shift register using 7495.

The term work should include a minimum EIGHT experiments. FOUR from group A and FOUR from group B.

NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 -2007
TERM - I
ELECTRICAL CIRCUITS AND MACHINES

Teaching scheme:
Lectures : 4 hrs/week
Practicals : 2 hrs/week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)
Term Work : 25 Marks

UNIT – I

DC circuits: circuit definitions, sources of energy, source conversion, mesh analysis, nodal analysis, Thevinin`s theorems, Norton`s theorem, superposition theorem, maximum power transfer theorem,

Three phase circuits : Three phase supply, phase sequence , star and delta connection of three phase winding, line and phase voltages and currents in star and delta connections, power in three phase circuit with balance load for star and delta connections, measurement of three phase power by three watt meter method, two Watt meter method , single watt meter method, calculation of active and reactive power. Lectures-10, Marks -20

UNIT – II

DC Machines : construction ,types ,generator action, emf equation motor action , significance of back emf , torque and speed equations , characteristics of shunt , series , compound motors, speed controll methods , starters , theoretical treatment of losses and power flow diagram of dc machines, applications of dc machines. Lectures-10, Marks -20

UNIT – III

Transformers : Single phase transformer construction , emf equation , transformer on no load , transformer on load , phasor diagram, equivalent circuit, efficiency and regulation, open circuit and short circuit tests,

Three – phase transformers : star / star, delta / delta, star / delta, delta / star connections, V-V and scott connections, Autotransformer, C.T. and P.T. Lectures-10, Marks -20

UNIT – IV

Synchronous Machines : Alternators – principle of operation , constructional features, emf equation, winding factors, voltage regulation by synchronous impedance method.

Synchronous Motors: principle of operation, rotating magnetic field, on no load ,on load , phasor diagrams, 'V' curves, hunting, method of starting . Lectures-10, Marks -20

UNIT –V

Induction Motors: Three phase motors - principle of operation, construction, slip, torque equation , torque slip characteristics, relation between slip and rotor copper loss and rotor input, equivalent circuit, different types of starters, applications induction motors.

Single phase Induction motors - principle of operation, types, and applications.

Special purpose machines: Principle, working and application of stepper motor, servo motor, universal motors. Lectures-10, Marks -20

REFERENCES:

1. Edward Hughes : Electrical technology, ELBS.6/e
2. V. N. Mittal : Basic electrical engineering, TMH. 2/e
3. Nagarath and Kothari : Electrical machine, TMH.2/e
4. S.K. Bhattacharya : Electrical machine, TMH. 2/e
5. V. Del Toro : Electrical machines and power systems, Pearson.

LIST OF EXPERIMENTS:-

1. Two Wattmeter method of power measurement in three phase balanced load.
2. Speed control of D.C. shunt motor by armature voltage and flux control method,.
3. Load test on D.C. shunt motor
4. Load test on D.C. series motor.
5. O.C. and S.C. test of single phase transformer to determine regulation and efficiency.
6. Scott connection to convert three phase supply to two phase supply.
7. Regulation of alternator by synchronous impedance method.
8. Regulation of alternator by direct loading method.
9. To plot 'V' curve and P.F. curve for synchronous motor.
10. Load test on three phase induction motor.
11. Study of various single phase motors.
12. Study of three point starter.

The term work should include minimum EIGHT experiments , from the list..

NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 -2007
TERM - I
SEMICONDUCTOR DEVICES AND CIRCUITS

Teaching scheme:
Lectures : 4 hrs/week
Practicals : 4 hrs/week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)
Term Work : 25 Marks
Practical : 50 Marks

UNIT - I

Semiconductor physics and semiconductor diodes: Conduction mechanism in extrinsic semiconductors, carrier concentrations, mobility, drift and diffusion current densities, mass action law, Einstein's relation and charge density relation. Piecewise linear diode model, V - I characteristics equation, static and dynamic resistances of diode, small signal and large signal model of diode.

Diode applications and special types of diodes: FWR, capacitor filter, power, shottkey and PIN diode, diode switching times and junction capacitance. Lectures-10, Marks -20

UNIT - II

BJT biasing and small signal models: Need for biasing BJT circuit, voltage divider biasing , stability factors, thermal runaway and compensation circuits. Low frequency h - parameter analysis , derivations for CE configuration for A_i, R_i, R_o, A_{vs}, A_{is} (exact / approx. analysis) in terms of h - parameters, Miller theorem and its dual, CE – CC and CE – CB parameter conversion, comparison of performance parameters with CB and CC configurations in tabular form. Need for multistage amplifiers. Cascade analysis of CE – CE, CE – CC and CE – CB. Darlington configuration, boot strapping.

. Lectures-10, Marks -20

UNIT - III

Field effect transistors : An overview of different types of FET's viz JFET , MOSFET, MESFET, JFET : JFET construction, symbol, basic operation , V - I characteristics, transfer characteristics, cut-off and pinch off voltages, trans conductance , Input resistance and capacitance, Drain to source resistance, Universal JFET bias curve. Biasing arrangements for JFET , biasing against device variation , biasing for zero current drift, d.c.analysis using graphical approach. JFET as voltage controlled source JFET amplifiers :CS, CD, CG amplifiers, their analysis using small signal JFET model.

Lectures-10, Marks -20

UNIT - IV

MOSFET's: An overview of following MOSFET's types – DMOSFET, EMOSFET, Power MOSFET nMOSFET, pMOSFET and CMOS devices .handling precautions for CMOS devices, D and E MOSFET characteristics and parameters, non ideal voltage current characteristics finite output resistance , body effect subthreshold conductions , break down effects and temperature effects , MOSFET biasing ,introduction to MOSFET as VLSI device.

MOSFET in VLSI: V - I characteristic equation in W / L ratio , MOSFET capacitances , CMOS inverter static characteristic , noise margin, threshold voltage

Lectures-10, Marks -20

UNIT - V

Frequency responses for BJT and FET: Concept of frequency response , human ear response to audio frequencies ,significance of octaves and decades .The decibel unit ,square wave testing of amplifiers. Effect of coupling, by pass, junction and stray capacitances on frequency response for BJT and FET amplifiers. Concept of dominant pole, N stage cascade amplifier, band pass of cascaded stages, concept of gain band width product.

Lectures-10, Marks -20

REFERENCES:

1) Thomas L Floyd : Electonics devices , Pearson 6/e
2) Millman Halkias: Integrated electronics ,TMH publications
3) Boylested Nashelsky: Electronics devices and circuits, ,Pearson LPE 8/e
4) Donald A, Neamen : Semiconductor physics and Devices – Basic Principles, TMH. 3/e
5) Cathey and Singh : Electronics Devices and circuits , TMH 3/e
6) D.R.Cheraku , B.T.Krshina : Electronics Devices and circuits, Pearson
7) R.S.Sedha : Applied Electronics , S Chand Publication.

LIST OF EXPERIMENTS:-

1) For a half wave rectifier with capacitor filter find line and load regulation and ripple factor.
2) For a bridge rectifier with capacitor filter find line and load regulation and ripple factor.
3) For full wave rectifier with capacitor filter find line and load regulation and ripple factor.
4) Determine h-parameters for CE configuration.
5) Determine I/P and O/P impedances and voltage gain of a CE stage followed by CC.
6) Measurement of I/P and O/P impedances and voltage gain of Darlington circuit without and with bootstrapping.
7) Plot characteristics of CSFET. Determine amplification factor, transconductance and dynamic resistance.
8) Determine I/P and O/P impedances and voltage gain and current gain for CSFET.
9) Plot characteristics of CSDMOSFET.
10) Plot characteristics of CSEMOSFET.
11) Square wave testing of an amplifier used to find lower and higher cut off frequency.
12) For two cascaded CE-CE stages, find voltage gain and bandwidth.
13) For cascode amplifier determine voltage gain and bandwidth.
14) Study frequency response of CSFET.
15) Study the effect of bypass capacitor on frequency response of single stage CE amplifier

The term work should include a minimum TWELVE experiments from the list.

NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E.(ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 –2007
TERM - I

ELECTRONICS WORKSHOP

Teaching scheme:
Practical : 2 hrs/week

Examination scheme:
Term Work : 25 Marks

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I.] Multimeters and Power supply

(a) Study of Analog and Digital Multimeter (DMM)

1) To study AC / DC voltage and current ranges, different ranges for resistance and other functions.
2) Comparison of DMM and True RMS meters.
3) Difference in V_{rms}, V_{dc} and $V_{average}$ voltages.
4) Importance of $3_{1/2}$ digit and $4_{1/2}$ digit multimeters.
5) Study of different types of fuses used for multimeter.
6) Different types of batteries used in multimeters, voltage and current ratings.

(b) Study of Power Supply

1) Single Power Supply
2) Dual Power Supply
3) Dual Tracking Power Supply
4) Variable AC Power Supply

Measurement of voltage and current levels at different ranges

II.] Study of Cathode Ray Oscilloscope (C.R.O.)

a) Function of front panel knobs, different types of screens used for C.R.O.and probes.
b) Measurement of various parameters e.g. AC,DC voltages , currents, time , frequency measurement lissageous pattern and by phase shift method
c) Study of different types of C.R.O.

III.] Study of signal generator.

a) Study of front panel of signal generator.
b) Adjusting different signals (sine, square, triangular) along with voltages and frequencies
c) Significance of source resistance, offset voltage

IV.] Study of passive components

a) Resistors
   1) Different types:- MFR, MFR precision, CFR, Wire-wound, Variable resistors, potentiometers, trimpots of different wattages e.g. 1/8, ¼, ½ ,1 watt.
   2) 3, 4, 5 band resistors and colour codes of resistors.
   3) Fixed resistors
   4) Importance of zero ohm resistance
   5) E-series alpha numeric resistance like E6, E12, E24 resistors.
b) Capacitors

   Different types of capacitors (Fixed and Variables)

   1) Fixed : - ceramic, tantalum, aluminium, polysterene, mica, metalised poly paper, electrolytic etc.
   2) Variables: - air-dielectric, trimmer, ganged capacitors. Voltage and capacitance ratings
   3) Calculation of capacitance like 101, 102, 103,104 etc on ceramic capacitors.

4) Identification polarities of electrolytic capacitors.
5) Testing of polarized capacitors using analog meters [≥ 1μf].
6) Checking of capacitors on meters and identification of open / short of capacitance.
7) Colour coding of capacitors.

c) Inductors: -
Different types : ferrite core, iron core, RF coil, power transformer (step-down) , pulse transformer.
Study of quality factor.

V.] Study of hardware components

a) Wires and cables: different types like single strand, multi strand, ribbon cable, co-axial cable (75 ohm), TV antenna cable (300 ohm).
b) Switches: SPDT, DPDT, Toggle, Rotary, Micro, Membranes, Sliding.
c) Relays: general purpose, reed, pcb mounting, body mounting.
d) Wire connectors: relimate, power connector, D - type, FRC

VI.] Study of Active components
Diodes, Transistors, FET / MOSFET

a) Study of different types of diodes: rectifier, switching, power diode, number identification using datasheets.
Frequency operation of switching diodes, zener diodes, LED, LCD.
Testing of diodes (by multimeters).
b) Transistors: (BJT / FET)
Study of different types of transistors e.g. Audio, semi-power, power with their numbers, company names, Xerox of data sheet.
Identification of the types of transistors (NPN, PNP)
Different packages of transistors.
Testing of BJT (Using DMM).
Testing of FET (Using DMM).

VII.] a) Build and test any basic electronic circuit on bread board .
b) Preparation of artwork and layout of above circuit . Preparation of its PCB and testing the circuit.

REFERENCES:

1. James and M. Krickpatrick : Electronic Drafting and PCB Design , Thomson publications.
2. W. C. Bosshart : Printed Circuit Boards Design And Technology, TMH
3. Motorola power data book

Note: The term work is based on above syllabus with minimum EIGHT experiments and experiment from part VII is compulsory

NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E.(ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 –2007
TERM - II
MANAGEMENT SCIENCE

Teaching scheme:
Lectures : 4 hrs/week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)

UNIT - I

History of management, Scientific management and its principles, Administration management, Neo-Classical theory

Therbligs, Modern Management theories, Relation between Administration, Management and Organization, Levels of Management

Functions of Management

Lectures-10, Marks -20

UNIT - II

Organizational structures- Line, Functional, Line and staff, Forms of Business Ownership-Proprietorship, Partnership, Joint Stock company-Private limited. company, Public limited. company , Co-operative organizations, Public sector, Joint Ventures their meanings ,formation, advantages, limitations and applications.

Lectures-10, Marks -20

UNIT - III

Engineering Economics, Wants,Utility,Demand,Supply, Elasticity of demand and supply, Capital-Fixed capital, Working Capital

Sources of finance-Shares, Debentures, Ploughing Back of Capital, Loans from Banks, Trade Credit, Public Deposits, Financial- Institutions, Foreign Capital

Cost Estimating, Cost Accounting, Fixed Costs, Variable Costs, Selling Price (No Numerical)

Lectures-10, Marks -20

UNIT - IV

Manpower Planning, Factors affecting Manpower Planning, Sources of Recruitment, Need, Objectives and Benefits of Training Methods of training Workers, Supervisors and Executives Job Evaluation and Merit Rating (concept only)

Selling and Marketing Concept, Sales Promotion, Advertising

Lectures-10, Marks -20

UNIT - V

Industrial Acts:

Factories Act, Industrial Accidents, Industrial Safety, Quality Concepts, Total Quality Management, ISO 9001-2000, Intellectual Property Rights - Patents, Trademarks, Copy Rights

Lectures-10, Marks -20

REFERENCES:

1. M.Mahajan : Industrial Organization and Production Management, Dhanpat Rai and compony
2. O.P Khanna : Industrial Engineering and Management, Dhanpat Rai and compony
3. Koontz :Essentials of Management, TMH 6/e.

S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 -2007

TERM - II

ELECTRONICS CIRCUITS AND APPLICATIONS

Teaching scheme:
Lectures : 4 hrs/week
Practicals : 4 hrs/week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)
Term Work : 25 Marks
Practical : 50 Marks

UNIT - I

Diode Application:Voltage Multiplier Circuits: Working and comparison of voltage doubler, tripler and voltage quardrupler configuration. Limitations of voltage multiplier circuits. **Clipping and Clamping circuits:** Series and parallel form of clipping circuits, biased clipper, their operation and transfer characteristics, clamping circuits.

Differential Amplifiers: Emitter coupled differential amplifier, FET differential amplifier.D.C. Analysis of BJT and FET differential amplifier, Common Mode Rejection Ratio methods used to improve CMRR. Schmitt Trigger circuit.

Lectures-10, Marks -20

UNIT - II

High Frequency, small signal BJT amplifiers: Behaviour of transistor at higher frequency, high frequency hybrid "π" CE amplifier model. CE short circuits current gain for π models. Definitions and derivations for f_α, f_β and f_γ.Technique to improve bandwidth; cascode amplifiers.

Single tuned, doubled tuned and staggered tuned amplifiers, calculation of unloaded and loaded Q, effect of staggering on bandwidth [No derivations], neutralization

Lectures-10, Marks -20

UNIT - III

Large Signal AF BJT Amplifiers: Classes of power amplifiers: Class A, Class B, Class AB. An overview and applications of Class C and Class D amplifiers. Class A with resistive load, transformer coupled Class A amplifier, Class B push-pull, Class AB, complimentary symmetry, and quasi complimentary configuration.

Efficiency analysis for Class A transformed coupled and Class B push pull amplifiers. Comparison of efficiency of other configuration, distortion in amplifiers, concept of total harmonic distortion.

Lectures-10, Marks -20

UNIT IV

Feedback Amplifiers and Oscillators: Concept of feedback, negative and positive feedback, classification of feedback amplifiers based on feedback topology [voltage, current, transconductance and transresistance amplifiers]. Advantages and Disadvantages of negative feedback. Effect of feedback on input and output impedances and bandwidth of an amplifiers. Analysis of circuit for each feedback topology.

Oscillators: Barkhausen Criterion, study of following oscillators circuits (using BJT / FET) .LC Oscillators : General form of LC Oscillators, Hartley Oscillator, Colpitts Oscillators, Clapp Oscillators, Crystal Oscillators.

Lectures-10, Marks -20

UNIT - V

Linear Voltage Regulators and Voltage References:

Block diagram of regulated power supply, series regulator, line and load regulation, output resistance

Analysis of emitter follower regulator and controlled feedback type regulator. I.C. voltage regulator [IC 723]. Method for boosting output current using external series pass transistor.Protection circuits for regulator, over current protection, simple and fold back current limiting. Three terminals floating, dual and adjustable regulators. Current Boosting (LM 340, LM 320, 78XX, 74XX series) SMPS, UPS [Block Diagram and working only].

Lectures-10, Marks -20

REFERENCES:

1) Salivahanan, Kumar and Vallavraj : Electronics Device & circuits , TMH
2) Millman and Halkias: Integrated Electronics ,TMH
3) Allen Mottershead : Electronics Devices and Circuits Introduction , PHI
4) Boylestad Nashelsky : Electronics Devices and circuits, Pearson 9/e
5) Malvino : Electronics Principles , TMH

LIST OF EXPERIMENTS:

1. Emitter Coupled Differential Amplifiers Calculation of CMRR using emitter resistance.
2. In experiment 1 , emitter resistance is replace by (Constant current source) find CMRR
3. Plot frequency response of single tuned amplifiers.
4. Measure the response of Schmitt trigger circuit for a sine wave input observe Hysteresis characteristics, calculation of UTP, LTP.
5. Line and Load regulation of a series regulator.
6. Plot frequency response of voltage series feedback amplifiers calculation of bandwidth.
7. Class A transformer coupled efficiency calculation.
8. Class B push pull amplifiers efficiency calculation.
9. Oscillators circuits L C Oscillators, Hartley, Clapp/Colpitts.
10. Determination of frequency and output voltage of crystal oscillator..
11. Effect of feedback on Ri, Ro and Av for voltage series feedback amplifier.
12. Plot frequency response of stagger tuned amplifiers.
13. Complementary symmetry power amplifier, calculation of efficiency.
14. To observe & elimination of crossover distortion in complimentary symmetry class B amplifier.
15. IC LM317 for fixed out put, adjustable output ¤t regulation.
16. Low and High voltage measurement and regulation characteristics using LM723.
17. Regulation characteristics of voltage doubler circuit
18. Q point, Ad, Ac &CMRR measurement for BJT differential amplifier

The term work should include a minimum TWELVE experiments from the list.

NORTH MAHARASHTRA UNIVERSITY JALGAON

S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)

W.E.F 2006 -2007

TERM - II

ENGINEERING MATHEMATICS – III

Teaching Scheme:	Examination Scheme:
Lectures : 4 Hrs/Week	Theory Paper : 100 Marks (3 Hours)
Tutorials : 1 Hr/Week	Term Work : 25 Marks

Unit – I : Linear Differential Equations

Linear Differential equation of order n, Solution of LDE with constant coefficient, method of variation of parameters, equations reducible to linear form with constant co-efficients, Cauchy's linear equation, Legendre's linear equation. Solution of Simultaneous and Symmetric Simultaneous Differential equation Applications to electrical circuts. Lectures-10, Marks -20

Unit – II : Complex Variables

Functions of complex variables, Analytic functions, C-R equations, Conformal mapping, Billinear transformation, Residue theorem, Cauchy's Integral theorem and Cauchy's Integral formula (without proof). . Lectures-10, Marks -20

Unit – III : Fourier and Z – Transforms

Fourier Transform (FT): Fourier Intergral theorem. Sine and Cosine Integrals. Fourier ,Transform, Fourier Cosine Transform, Fourier Sine Transform and their inverses.,Problems on Wave equation.

Z Transform (ZT): Definition, standard properties (without proof), ZT of standard sequences and Inverse. Solution of simple difference equations, Applications of Z Transform to discrete system analysis.

. Lectures-10, Marks -20

Unit –IV: Laplace Transform (LT)

Definition of LT, Inverse LT. Properties and theorems. LT of standard functions. LT of some special functions viz, error, 1st order Bessel's Periodic, Unit Step, Unit Impulse and Ramp. Problems on finding LT and Inverse LT. Initial and final value theorems.Applications of LT for Network Analysis.

Lectures-10, Marks -20

Unit – V Vector Integration.

a) Applications of partial differential equations to :

1. Vibration of strings or wave equations:

$$\frac{\partial^2 y}{\partial t^2} = a^2 \frac{\partial^2 y}{\partial x^2}$$

2. One dimensional heat flow equation.

$$\frac{\partial u}{\partial t} = a^2 \frac{\partial^2 u}{\partial x^2}$$

3. Laplace equation Two dimensional heat flow equation.

$$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$$

by separating variables only.

b) Line Integral, Surface and Volume integrals, Gauss's, Stoke's and Green's Theorems (without proof). Applications to problems in Electromagnetic Fields. Lectures-10, Marks -20

REFERENCES:

1. Erwin Kreyszig :Advanced Engineering Mathematics , John Wiley and sons
2. H.K. Dass : Advanced Engineering Mathematics , S. Chand
3. Wylie C.R. and Barrett : Advanced Engineering Mathematics , Mc Graw Hill
4. B.S. Grewal : Higher Engineering Mathematics , Khanna Publication, Delhi.
5. B.V. Raman : Engineering Mathematics , Tata Mc- Graw – Hill.
6. P.N. Wartikar and J.N. Wartikar : Applied Mathematics (Volume I & II), Pune Vidhyarthi Griha Prakashan, Pune
7. Thomas L. Harman James Dabney and Norman Richer : Advance Engineering Mathematics with MATLAB, Books/Cole, Thomson Learning 2/e
8. Dr. Gokhale, Dr. Chaudhari and Dr. Singh :Engineering Mathematics – III

S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 -2007
TERM - II
NETWORKS AND LINES

Teaching scheme:	Examination scheme:
Lectures : 4 hrs/week	Theory Paper : 100 Marks (3 Hours)
Tutorial : 1 hrs/week	Term Work : 25 Marks
Practical : 2 hrs/week	Practical : 25 Marks

UNIT – I

A.C. circuits and theorems – Mesh and nodal analysis, Thevenins , Nortons, Millmans, Reciprocity, and Maximum power transfer theorem.(A.C. analysis)

Graph theory and network equations – Introduction, graph, tree, co-tree and loops. Incidence matrix, cutset matrix, tieset matrix and loop currents, number of possible trees of a graph, analysis of networks, network equilibrium equations. duality general network transformation.

Lectures-10, Marks -20

UNIT – II

Resonance – Introduction , Q- factor, series resonance, selectivity and bandwidth, selectivity with variable capacitance and variable inductance, Parallel resonance, selectivity and bandwidth, Maximum impedance condition with C, L and f variable, current in antiresonance, General case resonance.

Transfer and mutual inductance, Coupling coefficient, properties of ideal transformer, impedance matching with transformer, “L” and “T” circuit impedance matching.

Lectures-10, Marks -20

UNIT – III

Four Terminal Network and Transmission Line- Two port network classification, characteristic impedance and propagation constant for symmetrical network , image and iterative impedance for asymmetrical network, Terminal impedances, reduction of complicated network into its equivalent T and π networks.

Transmission line as two port network, cascaded sections, characteristic impedance and propagation constant. Transmission line general solution, infinite line, wavelength and velocity of propagation. Line without distortion, reflection on transmission line reflection coefficient and SWR.

Lectures-10, Marks -20

UNIT – IV

Filters and attenuators – Filter fundamentals, constant k type low pass and high pass filter, m derived filter , low pass and high pass m - derived filters, Band pass and band stop filters, half section , terminating half section, composite filter.

Attenuators - symmetrical T and π attenuators, ladder type attenuators, asymmetrical T and π attenuators.

Lectures-10, Marks -20

UNIT – V

Transient response – Standard input signals, first order transients, zero input response, step response, pulse response, switched dc transients, switched ac transients, second order natural response, second order circuit equations, over damped, under damped and critically damped response, second order transients, initial conditions.

Lectures-10, Marks -20

REFERENCES:-

1) D Roy Choudhary : Networks and Systems, New Age International
2) Carlson : Circuits, Thomson publications,
3) John D. Ryder : Network Lines and Fields, Prentice Hall of India, 2/e
4) M. E. Van-Valkenburg : Network Analysis, Prentice Hall of India.

LIST OF EXPERIMENTS:-

1) Verification of Thevenins and Nortons theorem for a two port reactive network.
2) Maximum Power Transfer theorem.
3) Series and parallel resonance- BW and Q factor
4) Frequency response of constant k filters and find out cut of frequency.
5) Frequency response of m derived filters and find out cut of frequency.
6) Frequency response of band pass filter
7) Design build and test symmetrical T or Π attenuator(plot attenuation Vs RL)
8) Measurement of Zo and γ for a transmission line.
9) To study the transient response of second order circuit
10) Measurement of VSWR and effect of terminating impedance on VSWR for a transmission line and evaluation of reflection coefficient.

The term work should include a minimum EIGHT experiments from the list including at least one experiment from each unit.

NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 –2007
TERM - II

ANALOG COMMUNICATION

Teaching scheme:
Lectures : 4 hrs/week
Practicals : 2 hrs/week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)
Term Work : 25 Marks
Practical : 50 Marks

UNIT – I

Introduction and importance of communication system: Modulation, Need for modulation, types of modulation, Noise : Internal sources of noise , external sources of noise, signal to noise ratio, noise figure , noise factor due to amplifiers in cascade , measurement of noise temperature and noise factor , Noise in reactive circuit, transit time noise, addition of noise due to several sources .

Lectures-10, Marks -20.

UNIT – II

Amplitude modulation concept : Introduction, modulation index, frequency spectrum of AM wave, power and current calculation in AM, AM generation circuits low level and high level modulation, block diagram of AM transmitter , single side band techniques, balance modulation circuits. SSB generation methods. (Filter method, phase shift, third method,) extension of SSB pilot carrier system, ISB system, VSB system. Lectures-10, Marks -20

UNIT – III

Angle modulation concept: Introduction, modulation index, frequency spectrum of FM wave, phase modulation, comparison between PM and FM, FM modulator circuits, (direct method, basic reactance modulator, stabilizes reactance modulator, varactor diode modulator, indirect method.) pre-emphasis, de-emphasis, narrow band and wide band FM. Lectures-10, Marks -20

UNIT – IV

AM / FM receiver : TRF receiver, super heterodyne receiver block diagram of AM and FM receiver, characteristics of receiver , (sensitivity , selectivity , fidelity, image rejection ratio, tracking), mixer stage , mixer circuits, AM detectors, AGC types , Muting circuits, Pilot carrier receiver, suppressed carrier receiver, ISB receiver, FM demodulator, Amplitude limiter , slope detector, balance slope detector, phase discriminator , ratio detector .

Lectures-10, Marks -20

UNIT – V

Types of communication channels: transmission lines, parallel wire, coaxial cable, submarine cable, wave guide, optical fiber cable.

Multiplexing: TDM, FDM, concept of radiation, electromagnetic spectrum, mechanism of propagation, ground wave, sky wave, space wave, duct, tropospheric, concept of fading and diversity reception

Introduction to TV system and introduction to telephone system.(Primary treatment only)

Lectures-10, Marks -20

REFERENCES:

1. George Kannedy and Bemard Davis : Electronics Communication System, Tata McGraw Hill.4/e
2. Robort Schoenbeck : Electronics Communication , PHI, 2/e
3. Dennis Roddy and John Coolen : Electronics Communication, Prentic-Hall of India. 3/e
4. Wayne Tomasi : Electronic Communication system, Pearson LPE 5/e
5. Taub and Schilling : Principle of communication, Tata McGraw Hill.
6. T.G.Thomas, S.Chandrashekhar : Communication theory, TMH.

LIST OF EXPERIMENTS:

1) Study of AM transmitter and calculate of modulation index of AM wave by envelope method.
2) Study of Diode detector circuit.
3) Study of FM transmitter.
4) Study of Amplitude limiter circuit.
5) Calculate gain for RF / IF stage with AGC and without AGC.
6) To plot frequency response curve for IF Amplifier.
7) Study of Phase discriminator.
8) Study of AM super heterodyne receiver.
9) Study of FM receiver.
10) Study of AM Mixer circuit. / balanced Modulator circuit.
11) Study of TV system.
12) Study of Telephone system.

The term work should include a minimum EIGHT experiments from the list.

NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 -2007
TERM - II
SOFTWARE APPLICATION – I

Teaching scheme: Examination scheme:
Practical : 2 hrs/week **Term Work : 25 Marks**

Objectives:
To make the students aware of:
1. Programming practice in C for numerical methods .
2. Use of application specific software tools in the design development simulation and testing of electronic circuits .
3. Use of mathematical software packages for understanding and modeling electrical signals and linear systems .

Section- A : Numerical computational techniques:
Instruction of following techniques assited by C programme/ function implimentation of at least THREE of them is expected .
Solution of transcendental &polynomial equation, bisection method,Newton Raphson ,secant, successive methods, solution of linear equations using Gauss elimination .Gauss-Jordan methods Newton's forward and backward difference equations, interpolation, numerical integration and differentiation: trapezoidal rule Simpson's 1/3 and 3/8 rule, Euler's Method.

List of suggested assignments:
1: Program to solve numerical methods : bisection method, Newton Raphson method using users defined functions. Functions should incorporate parameter passing techniques.
2. Program using Functions to solve differential equations by Euler's modified method.
3. Program using Function to find integration by Simpson's 1/3 and 3/8 method.

Section B: Simulation of typical circuits using circuit simulation tools
(a) Transistorized circuits.
 (1) Two stage amplifiers.
 (2) Series regulatator.
 (3) Audio Driver / Audio power Amplifiers.
(b) IC Based circuits
 (1) Sequential Digital circuits.
 (2) Combinational Logic
 (3) Timer Circuit

Section C : Simulation software based Experiments / Assignments:
Assignments related to Electronics Instrumentation, Digital circuits and logics design, Analog communication, Network and lines.

REFERENCES:
W H Hayt / J E Kemmerly / S M Durbin : Engineering circuit Analysis, TMH 6/e

Note: Term work should be based on minimum SIX assignments, THREE from section A and ONE each from section B (a), B (b) and C.

Faculty of Engineering & Technology

NORTH MAHARASHTRA UNIVERSITY,

JALGAON (M.S.)

THIRD ENGINEERING (T.E.)

ELECTRONICS AND COMMUNICATION,
ELECTRONICS AND TELECOMMUNICATION
TERM – I & II

W.E.F 2007 - 2008

NORTH MAHARASHTRA UNIVERSITY, JALGAON
STRUCTURE OF TEACHING AND EVALUATION
T.E.(Electronics & Communication / Electronics & Telecommunication)

FIRST TERM

W.E.F. 2007-08

Sr. No.	Subject	Teaching Scheme Hours/week			Examination Scheme				
		Lectures	Tutorial	Practical	Paper Duration Hours	Paper	TW	PR	OR
1	*Feedback Control System	4	--	2	3	100	25	--	--
2	#Electromagnetic Engineering	4	1	--	3	100	25	--	--
3	Digital Communication	4	--	2	3	100	25	25	--
4	*Microprocessor and Micro controller System	4	--	2	3	100	25	50	--
5	*Network Analysis and Synthesis	4	1	2	3	100	25	25	--
6	*Software Application-II	--	--	2	--	--	25	--	--
	Total	**20**	**2**	**10**	**--**	**500**	**150**	**100**	**--**
	Grand Total	**32**			**750**				

SECOND TERM

Sr. No.	Subject	Teaching Scheme Hours/week			Examination Scheme				
		Lectures	Tutorial	Practical	Paper Duration Hours	Paper	TW	PR	OR
1	*Electronics Measurements	4	--	2	3	100	25	--	--
2	Power Electronics	4	--	2	3	100	25	25	--
3	*Electronics Circuit Design	4	1	2	3	100	25	50	--
4	Information Theory and Coding Techniques	4	1	--	3	100	25	--	--
5	*Analog Integrated Circuits and Applications	4	--	2	3	100	25	25	--
6	#Practical Training / Mini Project / Special Study	--	--	2	--	--	25	--	--
	Total	**20**	**2**	**10**		**500**	**150**	**100**	**--**
	Grand Total	**32**			**750**				

* Common with TE (Electronics)
# Common with TE (Electronics) and T.E.(Electrical)

NORTH MAHARASHTRA UNIVERSITY JALGAON
T.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F : 2007- 08
TERM - I

FEEDBACK CONTROL SYSTEM

Teaching scheme:
Lectures: 4 hrs / week
Practicals: 2 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)
Term Work : 25 Marks

Unit I

Introduction to the control system, Servomechanisms, History and Development of Automatic Control, Digital Computer Control. Mathematical Models of Physical Systems, Differential Equations of Physical Systems, Transfer Functions, Block Diagram Algebra, Signal Flow Graph. Feedback and Non-feedback Systems, Reduction of Parameter Variations by Use of Feedback, Control Over System Dynamics by use of Feedback, Control of the Effects of Disturbance Signals by use of Feedback, Linearizing effect of Feedback, Regenerative Feedback.

Lectures 10, Marks 20

Unit II

Control system components: stepper motors, servomotors, synchros, and tachometer.
Standard Test Signals, Time Response of First and Second-order Systems, Steady-state Errors and Error Constants, Effect of Adding a Zero to a System, Design Specifications of Second-order Systems, Design Considerations for Higher-order Systems. The Concept of Stability, Necessary Conditions for Stability, Hurwitz Stability Criterion, Routh Stability Criterion, Relative Stability Analysis.

Lectures 10, Marks 20

Unit III

The Root Locus Concepts, Construction Root Loci, Root Contours, Systems with Transportation Lag, Sensitivity of the Roots of the Characteristic Equation, design of lead – lag compensator using Root locus. Effect of addition of poles and zeros on root locus

Lectures 10, Marks 20

Unit IV

Correlation between Time and Frequency Response, Polar Plots, Bode Plots, All-pass and Minimum-phase Systems, Log-magnitude versus Phase Plots. Nyquist Stability Criterion, Assessment of Relative Stability Using Nyquist Criterion. Design of Basic lead / lag compensators using Bode plot. Constant M and constant N circles

Lectures 10, Marks 20

Unit V

Concepts of State, State Variables and State Model, State Models for Linear Continuous-Time / Invariant Systems, State Variables and Linear Discrete-Time Systems, Diagonalization, Solution of State Equations, Concepts of Controllability and Observability, Pole Placement by State Feedback. Linear Approximation of Nonlinear Systems,
Introduction to Fuzzy Logic Control, Neural Networks, Robotic Control System. PI, PD, PID Controller. (Primary treatment only)

Lectures 10, Marks 20

References: -

1. I.J.Nagrath and M. Gopal - Control System Engineering - New Age International Publisher. 4th Ed.
2. Katsuhiko Ogata - Morden Control Engineering - Pearson Education Publication, Fourth Edition.
3. Ashok Kumar - Control System - Tata McGraw-Hill Publishing Company.

4. R. Ananda and P. Ramesh Babu - Control System Engineering - SciTech Publications (India)

List of Practicals:

1) Determine Magnitude and phase plot of lead electrical network.
2) Determine Magnitude and phase plot of lag electrical network.
3) Determine transient response of RLC Electrical network.
4) Study AC position control of Servomotor.
5) Study DC position control of Servomotor.
6) Study of flow control using PID controller (Simulation)
7) Study of synchros to observe angular displacement.
8) Study of stepper motor
9) Study of tachometer

Note: Minimum EIGHT practicals are to be performed

NORTH MAHARASHTRA UNIVERSITY JALGAON

T.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION, ELECTRICAL)

W.E.F : 2007- 08

TERM – I

ELECTROMAGNETIC ENGINEERING

Teaching scheme:
Lectures : 4 hrs / week
Tutorial : 1 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hrs)
Term Work : 25 Marks

UNIT I

Electrostatics:- Coulomb's law, Electric field due to line charge, Sheet charge and volume charge densities, Electric flux density, Gauss's law and Divergence theorem. Energy, Potential and Work-done, Potential gradient.Dipole and its electric field, Dipole movement. Energy density in electrostatic field.

Lectures 10, Marks 20

UNIT II

Conductor, Dielectrics and Capacitance:- Current and current density. Current continuity equation, Properties of conductors, Boundary conditions. Energy stored in capacitors, Poisson's and Laplace's equation's, Capacitance between parallel plates and co-axial cable using Laplace's equation.

Lectures 10, Marks 20

UNIT III

Magnetostatics:- Biot-Sarverts law and its vectorial form, Magnetic field due to infinitely long current carrying conductor ,Ampere's Circuital law. Application to co-axial cable. Curl operator, Magnetic flux density, Stoke's theorem. Scalar and Vector magnetic potential. Lorentz's Force equation. Energy stored in magnetic field. Lectures 10, Marks 20

UNIT IV

Time Varying Fields:- Faradays law , Maxwell's equations (Differential , Integral and Phasor forms). Uniform plane waves. Representation of wave motion in free space, perfect dielectrics and Lossy dielectrics (Wave equations). Poyinting Theorem and Power density. Propagation in good conductor and Skin effect. Reflection of Uniform plane waves. VSWR.

Transmission Line: - Impedance matching ,Single stub and Double stub transmission line. Introduction to Smith Chart.

Lectures 10, Marks 20

UNIT V

Radiation and antennas: - Radiation resistance. Radiation pattern. Calculation of Radiation resistance for short dipole, Short monopole, Half-wave dipole and Quarter-wave monopole antennas. Directivity, Reciprocity between Transmitting and Receiving antennas, Hertzian dipole, Vector retarded potential.

Types of Antennas: - Folded dipole, Yagi-uda, Horn antenna, Parabolic and Cassegrain feed antenna. Broadside, End fire, Binomial, Tchebysheff antenna arrays. Principle pattern multiplication, General pattern of two isotropic radiators. Lectures 10, Marks 20

References:

1) W. Hayt - Engineering Electromagnetics , TMH. (5th or 7th edition).
2) K. D. Prasad - Antenna and Wave Propagation, Satya Prakashan.
3) Guru and Hizirogli - Electromagnetic field theory fundamental, Thomson Publication
4) Narayan Rao - Basic Electromagnetics with application, PHI
5) J D Kraus - Electromagnetics, MGH ,4th edition.

Termwork:- Assignment will be based on the problems on EACH unit . (min.FIVE Assignments).

NORTH MAHARASHTRA UNIVERSITY JALGAON
T.E. (ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F : 2007- 08
TERM - I
DIGITAL COMMUNICATION

Teaching scheme:
Lectures : 4 hrs / week
Practicals : 2 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)
Term Work : 25 Marks
Practicals : 25 Marks

UNIT I

Spectral Analysis and Sampling :- Fourier series and fundamentals, The Fourier transform, signal spectra, Energy density spectrum, Power density spectrum, Auto and cross correlation functions, properties of Fourier transform, Parseval's theorem, Rayleigh Energy theorem, LTI system response and distortion less transmission, Band limited and time limited signals, sampling theorem in frequency domain and time domain, Nyquist criteria, Reconstruction using inter polation filters, Ideal, natural, flat top sampling, Aperture effect,

Lectures 10, Marks 20

UNIT II

Random Variables and Processes :- Probability theory fundamentals, Bays theorem, Random variables, discrete and continuous random variables, probability density function, cumulative distribution function properties, standard models like Poisson, Binomial, Rayleigh, Gaussian,UDF. Central limit theorem, Mean moment, variance.

Random Processes: Mathematical definition, stationary process, Mean, correlation, co-variance function, Ergodic process, transmission of random process through LTI filter, Gaussian process, power spectral density, Noise , Narrow band noise.

Lectures 10, Marks 20

Unit III

Waveform Coding and Synchronization : Pulse code modulation; PCM generation and reconstruction, Quantization, Quantization error , Non – uniform Quantization and companding – PCM with noise Error threshold. Delta modulation, Delta- sigma modulation , Adaptive delta modulation, Differential PCM – LPC speech synthesis. Data encoding formats, Digital Multiplexers. ISI, Eye diagram , Bit synchronizer, Early late synchronizer , scrambling and un scrambling , carrier recovery.

Lectures 10, Marks 20

UNIT IV

Digital Continuous Wave Modulation Technique : Introduction BPSK, Differential PSK, DEPSK, Quadrature PSK, M- ary PSK, Quadrature Amplitude shift keying, Binary frequency shift keying , minimum shift keying, GMSK, $\pi / 4$ QPSK.

NON-coherent detection of FSK, DPSK, QPSK, calculation of error probability of BPSK and BFSK.

Lectures 10, Marks 20

UNIT V

Performance Analysis of Digital Signals and Spread Spectrum. : Baseband signal receiver, probability of error, optimum filter, White noise - matched filter. Properties, probability of error of match filter. Spread spectrum: PN sequence DSSS with coherent BPSK, signal space representation and processing Gain, Probability of error, Frequency hopped spread spectrum. Introduction to multiple

Access Techniques: TDMA, FDMA and CDMA.

Lectures 10, Marks 20

References :

1) A B Carlson – Communication Systems (MGH 4th Edition)
2) Simon – Digital Communication Techniques , PHI
3) Amitabh Bhattacharya – Digital Communication (TMH)
4) Taub and Schilling – Principle of Communication Systems (TMH) 2nd ed
5) Das Mullick, Chatterjee – Principle of Digital Communication (New Age)
6) Proakis – Digital Communication (MGH 4 th Edition)
7) S.K.Venkataram - Digital Communication , S. Chand

List of Practicals

1) Verification of sampling theorem. PAM techniques. (Flat top and natural sampling) Effect of variable sampling rate, filter cut off , reconstruction of original signal using filter , aliasing effect
2) Study of DM , ADM , Techniques ,observation of effect of slope over load , granular noise and SNR measurement
3) Companded PCM (using A- Law) Plot quantization curve. SNR measurement ,
4) Generation and reception of QPSK in presence of noise
5) Generation and detection of FSK
6) Generation and detection of Quadrature Amplitude shift keyng
7) Study of line codes (NRZ, RZ, polar RZ, bi polar (AMI), Manchester) and spectral analysis
8) Generation and detection of DSSS coherent BPSK and spectral analysis.
9) Noise analysis using any software tool (use of any discrete distribution). Find response by changing parameters
10) Noise analysis using any software tool (use of any continuous distribution). Find response by changing parameters

Note: Minimum EIGHT practicals are to be performed, out of which minimum TWO practical using software tools are compulsory

NORTH MAHARASHTRA UNIVERSITY JALGAON
T.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F : 2007- 08
TERM - I

MICROPROCESSOR AND MICROCONTROLLER SYSTEM

Teaching scheme:	Examination scheme:
Lectures : 4 hrs / week	Theory Paper : 100 Marks (3 Hours)
Practicals : 2 hrs / week	Term Work : 25 Marks
	Practical : 50 Marks

UNIT I

Introduction to microprocessor and microcomputer system, functional pin diagram and detailed architecture of 8085 microprocessor, Demultiplexing of address / data bus, Generation of control signals, Instruction Set, Addressing modes. Programming for arithmetic and logical operation. Subroutine concepts.

Lectures 10, Marks 20

UNIT II

Functional pin diagram and architecture of 8031 / 51 microcontroller, Port structure, Instruction Set and assembly language programming.

Lectures 10, Marks 20

UNIT III

Timer / counter, modes of operation, Programming timer / counter.
Interrupt structure and Interrupts programming.
Serial communication programming in 8051 (only Standard 8-Bit UART Mode).
Memory interfacing (RAM, ROM, EPROM) - Basic concept in memory interfacing and address decoding.

Lectures 10, Marks 20

UNIT IV

Programmable Peripheral Interface (8255) – Block diagram, control words and modes and Interfacing.
Interfacing to external RAM and ROM, LED, Switch, 7-Segment display, Multiplexed 7-Segment display, Matrix Key-Board, Liquid Crystal Display, DAC, ADC, Stepper Motor with programs.

Lectures 10, Marks 20

UNIT V

Buses and Protocols – RS 232, RS 485, I^2C, MODBUS, IEEE 488.
Interfacing to EEPROM 93C46 / 56 / 66, 24C16 / 32 / 64, RTC DS1307.
Conceptual study of various derivatives of 8051 microcontroller from different manufacturers like Atmel, Phillips etc. Introduction to PIC microcontroller.

Lectures 10, Marks 20

References:

1. Gaonkar - Microprocessor Architecture , PHI.
2. Kenneth J. Ayala - 8051 Microcontroller, PHI.
3. Mazidi and Mazidi - The 8051 Microcontroller and Embedded Systems, Pearson.2nd ed
4. Mike Predko - Programming and Customizing 8051 micro controller, TMH.

List of Practicals:

1. Study of 8051 / 8085 assembler and Simulator.
    a) This is to be studied by writing program for addition / subtraction, multiplication / division.
    b) Executing external memory related instructions using MOVC / MOVX instruction (8051 only) *OR* Executing input / output or memory mapped input output related instructions (8085 only)
2. Writing a program which involves following any TWO (one using 8051and one using 8085):
    a) Celsius to Fahrenheit or Fahrenheit to Celsius conversion.
    b) Calculation of factorial.
    c) Multiple digit BCD arithmetic.
3. Write and Execute program to flash LED.
4. Write and Execute program to display 0 to 9 continuously on 7-Segment display,
5. Write and Execute program to demonstrate interfacing of 4 X 4 matrix Key-Board.
6. Write and Execute program to demonstrate interfacing of multiplexed 7-Segment display.
7. Write and Execute program to demonstrate interfacing of Liquid Crystal display.
8. Write and Execute program to demonstrate interfacing of DAC.
9. Write and Execute program to demonstrate interfacing of ADC.
10. Write and Execute program to demonstrate interfacing of Stepper Motor.
11. Write and Execute program to demonstrate Serial data Transmission.
12. Write and Execute program to demonstrate Serial data Reception.
13. Write and Execute program to demonstrate interfacing of Serial EEPROM 93C14 / 56 / 66 or 24C16 / 32 / 64.
14. Write and Execute program to demonstrate interfacing of RTC DS1307.

Note:

1. Experiments 3 to 14 should be performed with 8051 / 89c51 / 89c51RD2 kits using Assembler and downloading program.
2. Minimum EIGHT practicals are to be performed

NORTH MAHARASHTRA UNIVERSITY JALGAON
T.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F : 2007- 08
TERM - I
NETWORK ANALYSIS AND SYNTHESIS

Teaching scheme:
Lectures : 4 hrs / week
Practical : 2 hrs / week
Tutorial : 1 hr / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours).
Term Work : 25 Marks
Practical : 25 Marks

UNIT I

Concept of complex frequency, Characteristics of signals, standard signals, Laplace transform: Definition, Advantages in Network Analysis , Laplace Transform of waveforms , Network Analysis using Laplace Transform, Mesh Analysis. Node analysis , Thevenin Theorem and Nortons Theorem, Initial and final value theorem System Function, Impulse and state response of networks. , illustrative examples.

Lectures 10, Marks 20

UNIT II

System and Network Functions : Driving point admittance and impedance- Transfer impedance and admittance, voltages and current transfer Ratio, illustrative examples.
Natural frequencies, Poles and zeros in Network functions, significance of poles and zeros. Necessary conditions of driving point function and transfer function. Network with OP-Amps, Time domain behavior from poles and zeros plot in S domain.

Lectures 10, Marks 20

UNIT III

Two Port Networks Parameters: Z Parameter, Y parameter, h – parameter, ABCD parameter, Equivalent circuit using these parameters. Condition for reciprocity and symmetry of two port network in different parameters. Interconnection of two port networks. Cascade connection of two port networks parallel connection of two port networks. Series and series parallel connections. Inter conversion of parameters.

Lectures 10, Marks 20

UNIT IV

Synthesis of One and Two Port Networks : Hurwitz polynomials, positive Real functions. Synthesis of one port networks. Properties of LC immittance function, synthesis of LC driving point immittance, properties of RC driving point impedance or RL admittance, properties of RL impedances and RC admittances. Synthesis of RL , RC , LC , RLC functions. Synthesis in all Cauer / Foster form
Elements of Transfer function synthesis. Transfer function synthesis of two port networks.
Properties of transfer functions, zeros of transmission . synthesis of Y_{21} and Z_{21} and synthesis of constant resistance network.

Lectures 10, Marks 20

UNIT V

Filter Design: Frequency domain approximation of ideal low pass filter, Butterworth approximation, Tchebyshev approximation, synthesis of low pass filter, magnitude and frequency normalization, frequency transformation to generate high pass, band pass filter and band elimination filter from

normalized LPF.

Lectures 10, Marks 20

References:

1) Van- Vakenberg - Introduction to Modern Network Synthesis , PHI / Pearson 3rd ed
2) Franklin Kuo - Network Analysis and Synthesis
3) J Michael Jacob - Application of Design with Analog Integrated circuit , PHI 2nd ed
4) Gobind Daryanani - Principles of Active Network Synthesis and Design , Wiley
5) C P Kuriakose - Circuit Theory ; Elements of Network System , PHI
6) D Roy Chaudhary - Network and System , New Age
7) V K Atre - Network Theory and Filter Design, New age

List of practicals

1) Verify the Thevenin's theorem for given two port reactive circuit.
2) Determine transfer / driving point Impedance of given Two port reactive N/w.
3) Determine voltage and current transfer function of a given two port reactive N/w.
4) Determine pole - zero plot of given one port reactive N/w.
5) Determine Z parameter of networks connected in series.
6) Determine Y parameter of networks connected in parallel
7) Determine transmission parameter of networks connected in cascaded form.
8) Design and test low pass Butterworth filter
9) Design and test high pass Butterworth filter
10) Design and test low pass Tchebyshev filter

Note :- Minimum EIGHT practicals are to be performed..

NORTH MAHARASHTRA UNIVERSITY JALGAON
T.E. (ELECTRONICS , ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F : 2007- 08
TERM – I

SOFTWARE APPLICATION -II

Teaching scheme:
Practical : 2 hrs / week

Examination scheme:
Term Work : 25 Marks

Objectives:
Introduction to the various software tools in the design, simulation and testing of electronics circuits.

Section A:
Simulation of analog circuits using any software tool:

1) To find voltage and current of the given network using simulation tool.
2) To find transfer / Driving point impedance of two port network.
3) To design and test active filter.
4) Frequency domain analysis of given filter.

Section B:
Simulation of control system using any software tool:

1) To find the pole zero plot of the given network.
2) To find the polar / Nyquist plot of the given network.
3) To design and check any control system.
4) To obtain transient response and characteristics of any given network.

Section C:
Simulation of Radiation Patterns using any software tool:

To find the radiation pattern any four types of antennas and study the effects of varying parameters.

Note: Minimum SIX assignments, TWO from EACH section.

References :

i. RASHID - PSPICE
ii. Stephen Chapman - Matlab programming for Engineer, Thomson.
iii. Manuals / Books of concern software tools.

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T.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F : 2007- 08
TERM – I I
ELECTRONICS MEASUREMENTS

Teaching scheme:
Lectures : 4 hrs / week
Practical : 2 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours).
Term Work : 25 Marks

UNIT I

Analog instruments:

LCR-Q meter, True RMS meter, vector voltmeter, RF power and voltage measurement, Electronic multimeter, Amplified DC meter, AC voltmeter using rectifiers, Vector impedance meter, Output power meter, Field strength meter, Automatic bridge transmitter, Analog Ph meter, Bolometer method for power measurement.

Lectures 08, Marks 20

UNIT II

Digital Instruments

Microprocessor controlled bridges, Digital Readout Bridges, Digital counters and timers, Basic counter circuitry, main gate, Time base control circuit, Frequency measurement, measurement errors, Ratio of frequency measurement, Automation in digital instruments (Auto zeroing, auto polarity etc), Digital tachometer, Digital Ph meter, Phase meter, capacitance meter

Lectures 08, Marks 20

UNIT III

Signal Generators and Analyzers:-

Sine wave generator, Fixed Frequency AF Oscillator, Frequency synthesized signal generator, Random noise generator, sweep generator, Sweep marker generator, Colour bar generator, Vectroscope, Function generator.

Basic wave analyzer, Frequency selective wave analyzer, heterodyne wave analyzer, harmonic distortion analyzer, spectrum analyzer, Digital Fourier analyzer, logic analyzer, signature analyzer, OTDR meter, Wobbuloscope.

Lectures 10, Marks 20

UNIT IV

Oscilloscope:-

Introduction, principle, feature, block diagram, vertical amplifier, sweep types , delay line types , CRT diagram, CRT basics, PDA Tubes, dual beam CRO, dual trace CRO, VHF oscilloscope , VLF signal scope (analog storage and digital storage scopes), digital read out scopes, probes for CRO, attenuators, applications of CRO, fiber optic CRT, recording oscilloscope, hall effect probe , power scope.

Lectures 14, Marks 20

UNIT V

Data Aquisition, Conversion and Transmission:

Instrumentation system, interfacing transducer to electronic control, objectives of DAS , single channel multi channel DAS, ATS, computer based testing of audio amplifier ,radio receiver, data loggers, digital transducers. Data transmission systems, advantages and disadvantages of digital over analog transmitter, TDM, etc.

Lectures 10, Marks 20

References:

1) Helfrick and Cooper – Modern Electronics Instrumentation and Measurement Techniques , Pearson
2) Deoblin – Measurements systems: Applications and Design , TMH 5th ed
3) Nakra , Choudhari -- Instrumentation Measurements and analysis , 2/E TMH
4) H. S. Kalsi – Electronics Instrumentation, TMH 2nd ed

List of Practicals :

1) Measurement of reactive and resistive components with LCR Q meter.
2) Study of true RMS meter / DMM for measurement of EMS value of any AC signal.
3) Measurement of frequency Time with the help of frequency counter.
4) Study of Digital Tacho meter for measurement of motor speed .
5) Measurement of distortion and nature of distortion by harmonic distortion analyzer.
6) Study of spectrum analyzer for its application.
7) Measurement techniques using CRO (frequency, amplitude, phase, time and component tester).
8) Study of DSO to measure and store frequency and amplitude.
9) Study of DATA loggers for various parameter measurement.
10) Study of computerized analysis of radio receiver and measurement of power with it.
11) Study of ATS

Note :- Minimum EIGHT practicals are to be performed.

NORTH MAHARASHTRA UNIVERSITY JALGAON
T.E. (ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION ENGINEERING)
W.E.F 2007 –2008
TERM – II
POWER ELECTRONICS

Teaching scheme:
Lectures: 4 hrs / week
Practical: 2 hrs / week

Examination scheme:
Theory Paper: 100 Marks (3 Hours)
Term Work: 25 Marks
Practical: 25 Marks

UNIT I

Power Devices : S.C.R. Structure, characteristics, transistor Analogy , ratings, R , RC, UJT Triggering, dv / dt and di / dt protection. Structure and characteristics of IGBT, GTO, FCT, MCT, Electrically isolated drive circuit for IGBT and MOSFET.

Lectures 10, Marks 20

UNIT II

Line Frequency Controlled Rectifiers : Natural and Line commutation, single phase, Half and full controlled bridge rectifier with R load, Circuit diagram, waveforms, average load voltage, efficiency, Ripple factor, Form factor. Single phase Half and fully controlled bridge rectifiers with inductive load, circuit waveforms, average output voltage, RMS load voltage, average load power, active power, reactive power, current distortion factor, displacement factor, input power factor, Effect of source inductance. 3 - ϕ Half and fully controlled bridge rectifier with highly inductive load, circuit, operation and waveform, derivation of average and rms load voltage.

Lectures 10, Marks 20

UNIT III

DC – DC Converter Control of dc - dc- converter, step – down and step - up dc-dc converter, circuit diagram, waveform, output voltage calculations. Continuous conduction mode, boundary between continuous and discontinuous conduction.

Full bridge dc-dc converter– PWM Bipolar voltage switching. Switch mode power supply – Block diagram , control of SMPS – voltage feed forward control, current mode control, power supply protection. Electrical isolation in feedback loops.

Lectures 10, Marks 20

UNIT IV

DC – AC Inverters: Parallel inverters, principle of operation, 1 – ϕ Half bridge and full bridge inverters with R and R-L load, square wave and sinusoidal PWM switching, selection of frequency modulation ratio and amplitude modulation ratio. Harmonic analysis of square and quasi – square waveform, Harmonic load current, Harmonic reduction.

3 - ϕ Bridge inverter with balanced star resistive load, 120 degree and 180 degree conduction sinusoidal PWM switching scheme and Harmonic spectrum.

Lectures 10, Marks 20

UNIT V

AC Controllers and Application Principle of integral cycle and phase angle control. 1 ϕ Half wave and full wave AC control with R and R -L load, derivation of output Voltage. 3 - ϕ Half and full wave AC control, circuit diagram, waveforms and operation.UPS- configurations, Battery- Ah, back up time and battery charger rating calculations. Study of speed control of DC motor, speed control of AC motor.

References:

1. M.H. Rashid - Power Electronics circuits, devices and applications, PHI, 3/e . Or Pearson
2. Ned Mohan, T.M. Undeland and W.P. Robbins- Power Electronics, converters , Application, and Design , John willey and sons , 3/e
3. M.S. Jamil Asgar, - Power Electronics , PHI, 2004, New Delhi.
4. S.K. Bhattacharya - Industrial Electronics and control , Tata Mc-graw-Hill (TMH)
5. M Ramamurthy - An Introduction to Thyristor and their application, Second Edition,
6. M.D. Singh , K.B. Khanchandi - Power Electronics, TMH
7. Deodatta Shingare , Industrial and Power Electronics, Electrotech Pub.

LIST OF Practicals :

Group A

1) Study of R , RC and UJT triggering circuits of SCR to plot waveforms for various values of firing angle..
2) Implement optically isolated driver circuit for IGBT and MOSFET.
3) Study of 1 - ϕ Half controlled Bridge rectifier with R and RL Load , plot input and output voltage waveforms ,average load voltage v/s firing angle.
4) Study of 1- ϕ full controlled bridge converter with R and R-L load , plot input and output voltage waveforms ,average load voltage v/s firing angle.
5) Study of circuit and waveforms of step-down dc –dc converter and plot output voltage v/s duty ratio and switching frequency.
6) Study of circuit and waveforms of step-up dc –dc converter and plot output voltage v/s duty ratio and switching frequency.
7) Plot characteristics of IGBT, GTO .

Group B

8) Find Line and load regulation of SMPS.
9) Study of Parallel Inverter and find efficiency.
10) Study of I- ϕ full bridge inverter and find efficiency.
11) Study of 3- ϕ Bridge inverter and find efficiency.
12) Study of UPS
13) Study of 1- ϕ AC controller with R load and measure load voltage and plot waveforms for different firing angles
14) Study of 3- ϕ AC controller with R load and measure load voltage and plot waveforms for different firing angles

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Note :- Minimum EIGHT practicals are to be performed.(Minimum FOUR practicals from EACH group)

NORTH MAHARASHTRA UNIVERSITY JALGAON
T.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F : 2007- 08
TERM – I I
ELECTRONICS CIRCUIT DESIGN

Teaching scheme:
Lectures : 4 hrs / week
Practicals : 2 hrs / week
Tutorial : 1 hr / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)
Term Work : 25 Marks
Practical : 50 Marks

UNIT I

Design of Power Supplies : Design of Unregulated power supply , selection of transformer, diodes, capacitors , calculation of surge resistance (using bridge rectifier) Design of Discrete series regulated power supply with protection circuit , design of regulated power supply using IC LM- 340 series, design of Dual power supply using LM-317 and LM 337 IC's., Design of switching regulators , Buck regulator , Boost regulator, and Buck – Boost using switching regulator IC – LM 1577 / 2577 . Heat sink calculations for power supplies.

Lectures 10, Marks 20

UNIT II

Design of Small Signal (Voltage) Amplifier BJT / FET : Design of Bias circuits (BJT / FET) Design of single stage amplifiers (CE / CS , CG / CB / CC / CD) Use of negative feedback : feedback amplifier design. Designing of negative feedback amplifiers : voltage series , voltage shunt, current series, current shunt

Lectures 10, Marks 20

UNIT III

Design of Large Signal (power) Amplifiers: Class - A, class - B, Class - AB , Push-pull amplifier, complementary symmetry amplifiers , Monolithic power amplifier design using IC LM-379.

Lectures 10, Marks 20

UNIT IV

Design of High Frequency Amplifier : Design of Tuned amplifier BJT / FET single tuned , double tuned. Use of auto transformer (Tapped - inductor) High frequency, cascode amplifier. Design of oscillator circuits : Clapp, Colpitt , Hartley oscillaotor, Design of switching circuits: Astable multivibrator, Monostable multivibrator, Bistable multivibrator.

Lectures 10, Marks 20

UNIT V

Design using Analog Integrated Circuits. : Single supply amplifiers (AC inverting, AC Non inverting amplifiers) , instrumentation amplifier AD – 620 , V - I converter, I - V converter, V - F, F - V, converters.

Current amplifiers. Design of Non-linear circuits: Voltage comparators , peak detectors. , True RMS converter. Sallen-key active filter design: Second order Sallen-key low pass, high pass, band pass, band reject, unity gain and equal component circuit design for Butterworth, Chebyshev response. Higher order filter design.

Lectures 10, Marks 20

References:

1) M.M. Shah - Design of Electronics Circuits and Computer Aided Design , Wiley Eastem
2) Goyal , Khetan - Monograph on Electronics Design Principles , Khanna Pub.
3) Michael Jacob - Application and Design with Analog Integrated Circuits , PHI 2/e
4) Sergio Franco – Design with OP-AMP and Analog Integrated Circuits, TMH , 3/e.
5) Bell - Electronics Devices and Circuits, PHI or Pearson 4/e

6) Martin S Roden , Gordon – Electronics Design ,Shroff Pub. - 4/e.
7) Bell – Solid State Pulse Circuits , PHI 4/e
8) K.V.Ramanan - Functional Electronics, TMH

LIST OF Practicals :

UNIT – I

1) Design of Regulated power supply.
    a) Transformer selection.
    b) Rectifier (Bridge)
    c) Filter Designing (Capacitor)
    d) Transistor series Regulator (Feedback type) with current protection circuit (or) Design of Regulated power supply using IC LM 340 series.
2) Design of switching regulator circuit using switching Regulator IC LM1577 / 2577

UNIT – II

3) Design of single stage amplifier circuits using BJT / FET
    a) Inverting / non inverting amplifier.
    b) Self bias for BJT and potential divider for FET.
    c) Calculation of Performance parameters like A_v, R_i and R_o
4) Design Test and verify the negative feedback amplifier circuits using BJT / FET
    a) Design biasing network
    b) Feedback network
    c) Calculation of performance parameters like A_{vf}, R_{if} and R_{of}

UNIT – III

5) Design and Testing of monolithic power amplifier using IC LM 379
    a) Designing of External Components required.
    b) Measurement of output power.
6) Design of Transformer less class B push pull amplifier using BJT. For
    a) With cross over Distortion.
    b) Elimination of Cross over distortion.

UNIT – IV

7) Design the single stage tuned amplifier using BJT / FET for given center frequency.
    a) Design of biasing circuit
    b) Designing of tuned circuit
    c) Calculations and verification of f_o and Bandwidth.
8) Design of Astable multivibrator using BJT
    a) Selection of Transistor
    b) Design of all external components.
    c) Calculation and verification of desired output frequency and amplitude of output voltage.

UNIT – V

9) Design of Inverting / Non inverting single supply amplifier using LM 324
    a) Designing of Biasing circuits
    b) Verification of the given gain and input impedance.
10) Designing of Instrumentation Amplifier using AD 620
    a) Designing of External components for given value of gain.

    OR

    Design of voltage to frequency converters using IC AD 537 for given requirements and verification of the same.
11) Design and test a sallen – key second order low pass / high pass filter for given specifications.
12) Design and test a sallen – key second order band pass filter for given specifications.

NOTE : 1) Minimum FIVE practicals are to be performed ,at least ONE from EACH unit.
2) EACH experiments should be carried out in TWO turns. In FIRST turn designing

calculations are expected and in SECOND turn a complete circuit or major part of it be implemented.

3) Design using BJT must be carried out using h- parameters only.

NORTH MAHARASHTRA UNIVERSITY JALGAON

T.E. (ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)

W.E.F : 2007- 08

TERM – I I

INFORMATION THEORY AND CODING TECHNIQUES

Teaching scheme:	Examination scheme:
Lectures : 4 hrs / week	Theory Paper : 100 Marks (3 Hours)
Tutorial : 1 hrs / week	Term Work : 25 Marks

UNIT I

Information Theory and Channel Capacity : Introduction , Uncertainty, Information and Entropy, source coding theorem, Shannan fano algorithm data compaction, Discrete memory less channels, Mutual Information, channel capacity, channel coding theorem, differential entropy and mutual information for continuous ensembles . Information capacity theorem, Implication of the information capacity theorem, information capacity of colored noise channels, rate distortion theory, data compression.

Lectures 10, Marks 20

UNIT II

Error Control Coding : Introductions to error correcting codes, basic definitions, matrix description of linear block codes, equivalent codes . Parity check matrix, decoding of linear block codes, syndrome decoding , error probability after coding , perfect codes, hamming codes , optimal linear codes , maximum distance separable codes. Introduction to cyclic codes polynomials. The division algorithm for generating cyclic codes, matrix description of cyclic codes, Burst error correction, fire codes, golay codes, Cyclic Redundancy check codes, circuit implementation of cyclic codes . FEC and ARQ systems.

Lectures 10, Marks 20

UNIT III

Convolutional Codes and Coding Methods : Introduction to convolutional codes, Tree codes and trellis codes, polynomial description of convolutional codes, distance notions for convolutional codes, Generating functions, Matrix Description of convolutional codes, viterbi Decoding of convolutional codes, distance bounds for convolutional codes, Turbo codes, Turbo decoding, Introduction to TCM , concept of coded modulation. Mapping by set partitioning, ungerboecks TCM design rules, TCM decoder Performance evaluation for AWGN channel. Burst error correcting Codes,

Lectures 10, Marks 20

UNIT IV

Application of Information Theory : Introduction to BCH codes, primitive elements, Minimal polynomials, Generate polynomials in terms of Minimal polynomials, same examples of BCH codes, Reed solemen codes, implementation of Reed Solomon encoders and decoders. Data compression. Introduction to data compression, The JPEG standards for loss less compression. Introduction to crypto graphy. Overview of encryption Techniques. RS algorithm, application of information theory. An optimum modulation system. Comparison of Amplitude modulation system with optimum system. Feedback communication system.

Lectures 10, Marks 20

UNIT V

Communication Link Design : Introduction to multi-user radio communications . Multiple Access Techniques. Introduction to satellite communication , Radio link analysis, wireless communication , statistical characteristics of multipath channels. Binary signaling, Over a Rayleigh fading channel . TDMA and CDMA wireless communication systems, wireless standards IS 95.

Lectures 10, Marks 20

References:

1. Ranjan Bose - Information Theory Coding and Cryptography, TMH
2) Taub and Schilling - Principle of Communication Systems, (TMH) 2nd edition.
3) J. Das , K Mulik, P.K. Chatterjee - Principle of Digital Communication , (New Age Int.)
4) Theodore S. Rappaport - Wireless Communication – Principles and practice ,(Pearson Ed) 2nd Ed..
5) J.G. Proakis - Digital Communications, (MGH), 4th Ed.

Note: - Assignment will be based on the problems on EACH unit . (min.FIVE Assignment)

NORTH MAHARASHTRA UNIVERSITY JALGAON
T.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F : 2007- 08
TERM – I I

ANALOG INTEGRATED CIRCUITS AND APPLICATIONS

Teaching scheme:
Lectures : 4 hrs / week
Practicals : 2 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)
Term Work : 25 Marks
Practicals : 25 Marks

UNIT I

Op-amp Basics

Block diagram of op-amp, differential amplifier, various configurations, dc and ac analysis, constant current bias circuits, current mirror, active load, dc level shifter, output stage, op-amp symbol, packages, 741 op-amp pin diagram, overview of general purpose and special purpose op-amp, their peculiarities and application areas, FET op-amp, MOSFET op-amp.

DC parameters: definitions and typical values, input bias current, input offset current, input offset voltage, offset voltage and bias current compensation, thermal drift, A.C. parameters: frequency response, stability of op-amp, frequency compensation, internally compensated op-amp, slew rate, its effect on op-amp output, gain bandwidth product, rise time, full power bandwidth, CMRR, SVRR, open loop and close loop operation of op-amp, ideal op-amp, practical op-amp, inverting and non inverting amplifier, and analysis using ideal and practical op-amp, concept of virtual ground.

Lectures 10, Marks 20

UNIT II

Op-amp Applications

Voltage follower, difference amplifier, summing amplifier, substractor, adder-substractor, peaking amplifier, instrumentation amplifier using 3 op-amp and its applications, linearization, isolation techniques, monolithic instrumentation op-amp IC AD 5219 (pin and functional diagram), ac amplifier, dc amplifier, V to I (floating and grounded load) and I to V converter, its applications, integrator and differentiator, their practical considerations.

Half wave and full wave Precision rectifiers, clipper, positive and negative clamper, peak detector, sample and hold circuit, IC LF398 (pin and functional diagram), log and antilog amplifier, Analog multiplier and divider.

Lectures 10, Marks 20

UNIT III

Comparators and Signal Generators

Inverting and non inverting comparator, zero crossing detector, window detector, Schmitt trigger, its advantages, limitation of op-amp as comparator, comparator IC study LM311, introduction to OTA.

Square wave generator, monostable multivibrator, triangular wave and sawtooth wave generator, sine wave generator, phase shift oscillator, Wien bridge oscillator.

Timer IC 555: Functional diagram, monostable operation, astable operation, applications. Function generator IC 8038.

Lectures 10, Marks 20

UNIT IV

PLL and Audio Power Amplifiers

V to F converter, IC AD537. F to V converter, IC LM 2917. PLL: basic principles, block schematic, phase detector, low pass filter, VCO IC 566, transfer characteristics, free running frequency, lock range, capture range, pull in time, PLL IC 565, block diagram, circuit connection, PLL application: frequency synthesis, FM demodulator, AM demodulator, FSK demodulator.

Audio power amplifier: LM380 specifications, features, applications, features of other amplifier such as LM384, LM 377, LM810.RF and IF amplifier IC.

Lectures 10, Marks 20

UNIT V

Active Filters, D to A and A to D Converter

Active filter: Butter worth low pass, high pass, band pass and band reject filter, first order and second order filter design, frequency scaling.

DAC Specifications: resolution, offset error, gains error. Weighted resistor DAC, its disadvantages, R-2R ladder DAC, inverted R-2R ladder, AD 558.

ADC specification: resolution, quantization error, offset error, gain error, linearity error, conversion time. Flash ADC, counter type ADC, successive approximation type, integrating type ADC, dual slope ADC, AD670. Frequency response of ADC, sample and hold circuit.

Lectures 10, Marks 20

References:

1) D.Roy Chaudhary ,Shalil Jain- Linear Integrated Circuit, New Age International, 2/e.
2) Coughling,Driscoll - Op amps and Linear Integrated Circuits, Pearson education, 6/e
3) Ramakant Gaikward - Op amp and Integrated circuit, PHI
5) Sergio Franco - Design with Operational Amplifier and Analog Integrated Circuits , TMH- 3 / e
6) Botkar - Integrated circuits, Khanna Pub.

List of Practicals

Study of op-amp data sheets: LM 741, OP-07

1. Op-amp parameter measurement: input bias current, input offset current, input offset voltage, slew rate of op-amp 741.
2. Design and test active integrator and differentiator circuits for given frequency.
3. Study the operation of half wave and full wave precision rectifier.
4. Design and test positive and negative clamper.
5. Design and test Schmitt trigger circuit using LM 311 for given hysteresis.
6. Design and test of square wave and triangular and saw tooth wave generator using op-amp for given frequency.
7. Design and test timer using IC 555 in monostable and astable mode.
8. Design and test function generator using IC 8038.
9. Design and test PLL using IC 565 PLL for given lock and capture range.
10. Design and test audio amplifier using IC LM380 with and without positive feedback.
11. Setup DAC circuit Using IC AD 558 and study its performance
12. Setup ADC circuit Using IC AD 670 and study its performance
13. Design and test second order Butterworth LP / HP filter.
14. Design and test BP Butterworth filter.
15. Design and test BR Butterworth filter.

Note: Minimum EIGHT practicals are to be performed, at least ONE from each unit. All practical should be performed on bread board.

NORTH MAHARASHTRA UNIVERSITY JALGAON
T.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION, ELECTRICAL)
W.E.F : 2007- 08
TERM – I I

PRACTICAL TRAINING / MINI PROJECT / SPECIAL STUDY

Teaching scheme:
Practical : 2 hrs / week

Examination scheme:
Term Work : 25 Marks

- Every student has to undergo industrial / practical training for a minimum period of two weeks either during summer vacation between (S.E Second Term) fourth term and (T.E. First Term) fifth term or during winter vacation between fifth term and sixth term (T.E. First Term and Second Term).

- The industry in which practical training is taken should be a medium or large scale industry

- The paper bound report on training must be submitted by every student in the beginning of (T.E. Second Term) sixth term along with a certificate from the company where the student took training.

- The report on training should be a detailed one.

- Maximum number of students allowed to take training in a company should be five. Every student should write the report separately.

- In case if a student is not able to undergo practical training, then such students should be asked to

  prepare special study report on a recent topic from reported literature .

  or

  prepare a mini project related to the Electronics / Electronic and Communication / Electronic and Telecommunication branch of engineering.

  1. The circuit for mini project must be designed by a student.

  2. The circuit should be simulated using any of the standard simulation software available.

  3. Result verification for paper design and simulation should be carried out and discrepancies should be discussed.

  4. Verified circuit should be assembled and tested on general purpose PCB/ Protoboard for actual working and practical results.

  5. Layout of circuit using standard Layout tool (Orcad / Protel / CADstar / Pads / Ultiboard) should be designed and PCB making process should be carried out.

  6. Assemble and test the circuit on PCB. Prepare bill of materials.

7. Project report should be detail of work, carried out by student, including layouts, circuits, bill of materials and relevant details

- The practical training / special study / mini project shall carry a term work of 25 marks. Every student shall be required to present a seminar in the respective class in the presence of two teachers. These teachers (appointed by the head of department in consultation with the Principal) shall award marks based on the following:

(a) Report	10 marks.
(b) Seminar presentation	10 marks.
(c) Viva -voca at the time of Seminar presentation	05 marks.

Total	25 marks.

T.E. (ELECTRONICS AND COMMUNICATION, ELECTRONICS AND TELECOMMUNICATION)

SR. NO.	OLD SUBJECTS	NEW SUBJECTS
1	NETWORK ANALISYS AND SYNTHESIS Term I	NETWORK ANALISYS AND SYNTHESIS Term I
2	MICROPROCESSOR TECHNIQUES Term I	
3	FEEDBACK CONTROL SYSTEM Term I	FEEDBACK CONTROL SYSTEM Term I
4	ELECTRONICS DESIGN - I Term I	
5	SIGNAL CONDITIONING AND DATA CONVERSION Term I	ANOLOG INTEGRATED CIRCUITS AND APPLICATIONS Term II
6	MICROPROCESSOR INTERFACING AND PERIPHERALS Term II	
7	POWER ELECTRONICS Term II	POWER ELECTRONICS Term II
8	COMMUNICATION SYSTEM - I Term II	
9	INDUSTRIAL MANAGEMENT Term II	MANAGEMENT SCIENCE at S.E. (E &C, E & T/c) Term II
10	ELECTRONICS DESIGN - II Term II	
11	Practical Training / Mini Project / Special Study Term II	Practical Training / Mini Project / Special Study Term II
12		ELECTRONICS CIRCUIT DESIGN Term II
13		MICROPROCESSOR & MICROCOLTROLLER SYSTEMS Term I
14		SOFTWARE APPLICATION - II Term I
15		DIGITAL COMMUNICATION Term I
16	ELECTRONIC MEASUREMENT at B. E. (E &C, E & T/c) Term II	ELECTRONIC MEASUREMENT Term II
17		INFORMATION THEORY AND CODING TECHNIQUES Term II
18	ELECTROMAGNETIC ENGINEERING at S. E.(E &C, E & T/c) Term I	ELECTROMAGNETIC ENGINEERING Term I

NORTH MAHARASHTRA UNIVERSITY,

JALGAON (M.S.)

BATCHELAR OF ENGINEERING (B.E.)

(FINAL YEAR)

ELECTRONICS AND COMMUNICATION,

ELECTRONICS AND TELECOMMUNICATION

TERM – I and II

W.E.F 2008 - 2009

NORTH MAHARASHTRA UNIVERSITY, JALGAON
STRUCTURE OF TEACHING AND EVALUATION
B.E. (ELECTRONICS and COMMUNICATION / ELECTRONICS and TELECOMMUNICATION)

FIRST TERM

W.E.F. 2008-09

SR.No.	Subject	Teaching Scheme Hours / Week			Examination Scheme				
		Lectures	Tutorial	Practical	Paper Duration Hours	Paper	TW	PR	OR
1	Radiation and Microwave Technology	4	-	2	3	100	25	25	-
2	* Fiber Optic Communication	4	-	2	3	100	25	-	-
3	***** Digital Signal Processing and Processors	4	-	2	3	100	-	25	-
4	***** Computer Communication Networks	4	-	-	3	100	25	-	-
5	Elective - I	4	-	2	3	100	25	25	-
6	***** Project - I	-	-	2	-	-	25	-	25
7	***** Seminar	-	-	2	-	-	25	-	-
	Total	**20**		**12**		**500**	**150**	**75**	**25**
	Grand Total	**32**			**750**				

SECOND TERM

SR. No.	Subject	Teaching Scheme Hours / week			Examination Scheme				
		Lectures	Tutorial	Practical	Paper Duration Hours	Paper	TW	PR	OR
1	Telematics	4	-	2	3	100	25	-	25
2	Television and Consumer Electronics	4	-	4	3	100	25	25	-
3	Satellite communication	4	-	2	3	100	25	-	-
4	Elective -II	4	-	2	3	100	25	25	-
5	***** Industrial Visit / Case Study	-	-	-	-	-	25	-	-
6	***** Project - II	-	-	4	-	-	100	-	50
	Total	**16**	**-**	**14**		**400**	**225**	**75**	**50**
	Grand Total	**30**			**750**				

*** Common with B.E. (Electronics Engineering)**

ELECTIVE I	i) Data Communication and Design
	ii) * Biomedical Instrumentation
	iii) System Programming
	iv) * VLSI Design
	v) Broad band Communication

ELECTIVE II	i) * Embedded System
	ii) * Digital Image Processing
	iii) * Neural Network and Fuzzy systems
	iv) Telecomm. Network Management
	v)Nanotechnology

NORTH MAHARASHTRA UNIVERSITY JALGAON
B.E. (ELECTRONICS AND COMMUNICATION, ELECTRONICS AND TELECOMMUNICATION)

W.E.F : 2008- 09

TERM - I

RADITATION AND MICROWAVE TECHNIQUES

Teaching scheme:
Lectures: 4 hrs / week
Practicals: 2 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)
Practical : 25 Marks
Term Work : 25 Marks

UNIT I

Guided waves and Transmission lines : Transmission line parameter, Transmission line equation, Transmission coefficient, reflection coefficient, Impedance matching, quarter wave transmission line, single stub, double stub matching (Analytically and using Smith chart), Solution of quarter wave transformer and single stub by using smith chart only

Electromagnetic Theory: Maxwell's Equation, Uniform waves, free space impedance Lectures 10, Marks 20

UNIT II

Wave guide Theory: Comparison between Transmission line and Waveguide, waveguide types rectangular and circular. Wave propagation through rectangular waveguide, Solution of wave equation in rectangular waveguide, Rectangular wave guide modes, Waveguide characteristics for TE and TM modes (for rectangular waveguide), equation for cut off wavelength, guided wavelength, guided velocity, group velocity

Passive Microwave components : Terminator, attenuator, ,traveling detector, Microwave filter, parametric amplifier, resonator, E-plane, H-plane, Magic Tee, Hybrid circuits, Ferrite Components, Microwave bridge Isolator, Circulator, Directional coupler, E-plane Tee, H-plane Tee, magic tees, Directional couplers, Ferrite components, Microwave bridge, Circulator, Isolator, slotted line, Tuners, coupling probes Lectures 10, Marks 20

UNIT III

Microwave Tubes: Limitations of conventional Tubes, Klystron tubes, Two cavity Klystron, Multi cavity Klystron, Modes of Reflex klystron, Efficiency of Reflex Klystron, Slow wave structure: (TWT) : O type, M type, Magnetron Efficiency, Advantages and disadvantages

Solid state Devices: GUNN diode, PIN diode, IMPATT, BARITT, TRAPATT, Monolithic Microwave strip line devices, Microwave Integrated circuits, Applications of Microwave Integrated Circuits Lectures 10, Marks 20

UNIT IV

Microwave Antenna

RF antenna and Microwave antenna, Horn antenna, Parabolic reflector with all types of feeding methods, slotted antenna, Lens antenna, Microwave strip line antennas, Equation for antenna gain, Directivity and Beam width of all above antenna types.

Microwave measurements: Frequency, Power, attenuation, VSWR, Impedance measurement. Lectures 10, Marks 20

UNIT V

Microwave Applications:

Wireless Microwave communication system: Radio Receiver Architecture, Noise Characterization
Radiometer System: Theory and application, total Power Radiometer, Dicke Radiometer
Microwave heating
Power Transfer
Bio-medical application
RADAR: Principle of Radar System, Pulse radar, Radar range equation, Doppler Effect, Blind Speed, CW Doppler MTI Radar

Lectures 10, Marks 20

References:

1. R. E. Collins - Foundation of microwave engineering, Tata McGraw hill
2. Pozar - Microwave Engineering , John Wiley
3. Annapurana Das, S. K das - Microwave Engineering, Tata McGraw Hill
4. Samuel Liao – Microwave Devices and circuits, Tata McGraw Hill
5. K. C. Gupta – Microwave, New Age
6. Peter A. Rizivi - Microwave Engineering,

List of Practical:

1. Reflex Klystron Characteristics
2. GUNN Diode Characteristics
3. Microwave Junction: Power splitting Characteristics
4. Directional coupler: Isolator, Coupling factor
5. Circulator, Isolator (Y type) Circulator and Isolation Calculation
6. VSWR Measurement (Using V_{max} / V_{min} Method)
7. Antenna Horn (Radiation Pattern and beam width)
8. Antenna parabolic (Radiation Pattern and beam width)
9. Measurement of attenuation (Fixed and variable)

Note: Minimum EIGHT practicals are to be performed.

NORTH MAHARASHTRA UNIVERSITY JALGAON
B.E. (ELECTRONICS, ELECTRONICS AND COMMUNICATION, ELECTRONICS AND TELECOMMUNICATION)

W.E.F : 2008- 09

TERM - I

FIBER OPTIC COMMUNICATON

Teaching scheme:
Lectures: 4 hrs / week
Practical: 2 hrs / week

Examination scheme:
Theory Paper: 100 Marks (3 Hours)
Term Work : 25 Marks

UNIT I

Introduction to Optical Fiber Communication System:

Block diagram of OFCS, Advantage and Disadvantage of OFCS over other communication systems. Ray theory of transmission and concept of acceptance angle and Numerical Aperture (Numericals based on this), Meridonial and skew propagate wave theory of optical propagation : cut – off wavelength. Group velocity and Group delay, Types of fibers (According to materials, Refractive index profile, Mode of propagation) Fiber Optic Splices, connectors, couplers, Directional Coupler.

Lectures 10, Marks 20

UNIT II

Light Sources and Detectors:

Sources : Factors or Characteristics for their selection in OFCS, Types : Light Emitting diodes, Laser diodes, Surface emitter LEDS, Edge emitter LEDS, Super luminescent LEDS, LED operating Characteristics, Modulation Bandwidth: 3-dB electrical bandwidth, 3-dB optical Bandwidth, Radiation patterns of surface and Edge emitters, Laser diode: Laser principles, semiconductor laser diode , Hetero junction Laser , strip- gromentry lasers, Distributed feedback lasers, laser diode operating Characteristics, Radiation patterns.

Detectors: Characteristics or factors for their Selection, P-N photo diode, P-I-N Photo diode, Avalanche photodiode, detector parameters: Quantum efficiency, Responsivity, speed of Response (Numericals based on this) Lectures 10, Marks 20

UNIT III

Modulation: Noncoherent / Coherent

Intensity Modulation: LED Modulation and Circuits (Analog and digital) Analog modulation formats; AM / IM Sub carrier Modulation, FM / IM Sub carrier Modulation. Digital Modulation formats; PCM: RZ, NEZ, Manchester, Bipolar codes, Other digital formats: PPM, PDM, OOK, FSK and PSK.

Detection: (Coherent detection / Heterodyne / Homodyne detection):- Optical heterodyne receivers, Optic Frequency Division Multiplexing. Lectures 10, Marks 20

UNIT IV

Losses in fibers: Absorption, scattering and bending losses. Signal distortion in optical fiber: Material dispersion, waveguide dispersion, intermodal dispersion. Noise in optical fiber: Thermal Noise, shot noise, S / N Ratio, Noise equivalent power (Numericals based on this)

Fiber Optics System Design: Optical power budgeting, Rise-time budget.

Optical Fiber Measurements: Measurement of Attenuation, dispersion, refractive index. Field Measurements: Optical time domain reflectometry. (OTDR) Lectures 10, Marks 20

UNIT V

Advanced Systems and Techniques: -

Wavelength Division Multiplexing, DWDM, optical amplifiers, Optical filters, Integrated optics, Optical Networks: SONET / SDH, Photonic switching, Local Area Networks, Optical Sensors. Lectures 10, Marks 20

References:

1. Jonn M. Senior - Optical fiber communication (Principles and Practice), Pearson
2. G. Keiser - Optical fiber communication, MH
3. Joseph Palais - Fiber optic communications, Pearson
4. Wilson Hawkes - Opto electronics, PHI
5. Selvrajan, Srinivas - Optical fiber communication, TMH
6. B.P.Pal - Optical fiber systems and sensors
7. Govind P. Agrawal - Fiber optic communications systems, wiley 3rd Ed.

List of Practical:

1. Electrical characteristics of (Different type LED)
2. Photometric characteristics of LED / LD (Polar Plot, Intensity Measurement)
3. NA Measurement for Single / Multi de, Gi / S1, fiber
4. Attenuation Measurement of optical fiber
5. Spectral characteristics of LED / LD
6. Fiber optic Analog / Digital transmitter / receiver parameter measurement
7. Study of fiber optical connectors
8. Spectral response of optical fiber
9. Parameter measurement of opto isolator
10. Study of OTDR.

Note: Minimum EIGHT practicals are to be performed

NORTH MAHARASHTRA UNIVERSITY JALGAON
B.E. (ELECTRONICS, ELECTRONICS AND COMMUNICATION, ELECTRONICS AND TELECOMMUNICATION)

W.E.F : 2008- 09

TERM - I

DIGITAL SIGNAL PROCESSING AND PROCESSORS

Teaching scheme:
Lectures: 4 hrs / week
Practical: 2 hrs / week

Examination scheme:
Theory Paper: 100 Marks (3 Hours)
Practical : 25 Marks

UNIT I

Discrete Time Signals and Systems:

Introduction: Basic elements of Digital Signal Processing Systems, Advantage and Limitation of Digital over Analog Signal Processing, Application of Digital Signal Processing: Spectral Analysis, Echo Cancellation, Image Processing, Biomedical Signal Processing, Classification of Signals. Discrete Time Signals: Representation, Standard Discrete Time Signals, Classification of Discrete Time Signals, Simple Manipulations of Discrete Time Signals, Sampling of Analog signals, Aliasing, Sampling Theorem. Discrete Time System: Block diagram representation of Discrete Time Systems, Classification of Discrete Time System, Convolution Sum, Properties of Convolution, Causality and Stability condition in terms of the Impulse Responses. Meaning of IIR, FIR, Recursive, Nonrecursive Systems, and Impulse Response of LTI Recursive System. Cross Correlation and Auto Correlation of two sequences. Lectures 10, Marks 20

UNIT II

Z Transform and its application to the analysis of LTI system:

Definition of Z transform, Meaning of ROC, Properties of ROC, Properties of Z transform, Inverse Z transform, Pole Zero plot of the function, Pole location and time domain behavior for causal sequences. Analysis of LTI Systems in Z domain: The System Function of LTI system, Response of LTI system with zero initial condition, Transient and Steady state responses, Causality and Stability of System. Pole zero cancellation. The one sided Z transform, Response of the system with nonzero initial conditions. Solution of difference Equations using Z transform. Lectures 10, Marks 20

UNIT III

Frequency Analysis of Discrete Time Signals and Systems:

The Fourier Transform of Discrete time Aperiodic Signals and Energy Density Spectrum, Frequency response of Discrete Time Systems, Magnitude and Phase response. Frequency Domain Sampling: The Discrete Fourier Transform, IDFT, The DFT as Linear Transformation, Twiddle factor, Properties of the DFT, Use of DFT in linear filtering, Frequency analysis of signals using DFT. Magnitude spectrum of signals. FFT Algorithms: Radix2 DIT and DIF algorithms to computer DFT and IDFT. Lectures 10, Marks 20

UNIT IV

Design and Realization of Digital Filters:

Basic Network Elements, FIR Filter Structure and Design: Direct form, cascade form, frequency sampling and linear phase structure. Fourier series, Windowing method. Gibbs phenomenon, Frequency sampling method of design. IIR Filter structure and Design: Direct form, Cascade form, Parallel form and Transposed structures. Impulse invariance, Bilinear Transformation method of design. Lectures 10, Marks 20

UNIT V

DSP Architecture:

Architectural features of DSP processors: Multiplier and Multiplier Accumulator (MAC), Modified Bus Structures and Memory Access schemes in DSP, Multiple access memory, Multiport Memory, Pipelining, Special addressing modes, Onchip Peripherals. Different generation of DSP Processors, Fixed point and floating point numeric representation and Arithmetic, Introducing the TI 6000 platform, Features of TMS320C62X Processors, EDMA, Host Port Interface, Expansion Bus, External Memory Interface (EMIF), Boot Loader, McBSP, Interrupts, Timers, Basic Interfacing Techniques. Lectures 10, Marks 20

References:

1. Proakis and Monolakis - Digital Signal Processing-Principles, Algorithms and Applications, Pearson Publication
2. Mitra S.K. - Digital Signal Processing, TMH Publication

3. B.Venkataramani, M.Bhaskar - Digital Signal Processor, Architecture, Programming and Applications,TMH.
4. Texas Instruments - Technical Reference Manual
5. Teaching Material for TI6000 platform from Texas Instruments
6. Thomas Cavicchi - Digital Signal Processing, Wiley

List of Practical:

1. Basic operations on sequences of equal and unequal lengths.
2. Sampling of continuous time signal and aliasing effect.
3. Convolution of two sequence\ Impulse response.
4. Spectrum of signals using DFT.
5. Frequency response of LTI Discrete time system.
6. Designing of FIR Filter.
7. Designing of IIR Filter.
8. Sampling audio signal at different sampling rate using DSP kit.
9. Interfacing with DSP Kit.
10. Implementation of digital filter using DSP Kit.
11. Using ADC and DAC for signal acquisition and play back after processing.

Note: Minimum EIGHT practicals are to be performed. At least TWO on any DSP platform.

NORTH MAHARASHTRA UNIVERSITY JALGAON
B.E. (ELECTRONICS, ELECTRONICS AND COMMUNICATION, ELECTRONICS AND TELECOMMUNICATION)

W.E.F : 2008- 09

TERM - I

COMPUTER COMMUNICATION NETWORK

Teaching scheme:
Lectures: 4 hrs / week

Examination scheme:
Theory Paper: 100 Marks (3 Hours)
Term Work : 25 Marks

UNIT I

Introduction to Computer Network: OSI model, TCP / IP and other network models, Different Networks: Novell Netware, Arpanet, NSFNET, Internet. Network Topologies: LAN, WAN, MAN

Physical Layer: Basic for data communication: Fourier analysis, Bandwidth Limited Signal. Transmission media: Twisted pair, Baseband coaxial cable, Broadband coaxial cable, Fiber optics. Wireless Transmission: Radio transmission, Microwave transmission, Infrared and light wave Transmission. Switching. ISDN: Narrowband ISDN: ISDN services, System architecture, Interface. Broadband ISDN: Virtual switching, Circuit switching, ATM Network, Transmission in ATM networks, ATM switches. Cable TV and internet over cable

Lectures 10, Marks 20

UNIT II

Data link layer: Design issues: Framing, Error detection and correction code, Flow control Data Link Protocols: Unrestricted Simplex Protocol, stop and wait protocol, Simplex Protocol for a Noisy Channel. Sliding Window Protocols: One bit sliding window, Using Go-Back n, Protocol using Selective Repeat. Practical Example of Data Link Protocols: The Data Link layer in HDLC, internet, ATM.

Medium access sub layer: Channel allocation Problem: Static Channel and dynamic Channel allocation in LANs and MANs. Multiple Access Protocols: ALOHA, Carrier Sense Multiple Access, Collusion Free Protocols, Wireless LAN Protocols. IEEE Standards For LANS and MANS:IEEE Standard 802.3 and Ethernet, (IEEE Standard 802.4) token Bus, (IEEE Standard 802.5) Token Ring, (IEEE Standard 802.6) distributed Queue Dual Bus. (IEEE Standard 802.2) Logical Link Control.

Lectures 10, Marks 20

UNIT III

Network layer : Design Issue: Internal Organization ,Virtual circuit and Datagram subnets, Routing algorithm: Shortest Path Routing, Flooding, Hierarchical Routing, Broad Cast Routing, Routing for mobile host, Multicast routing, Congestion Control Algorithms: Congestion Prevention Policies, Control in virtual Circuits Subnets, choke Packets, Load Shedding.

Lectures 10, Marks 20

UNIT IV

Internetworking: The network layer in the internet: IP Protocol, IP Address, Subnet, Internet control Protocols, Internet multicasting, IPv4: Datagram, Fragmentation, Checksum, Options ,IPv6: Advantages, Packets Formats Extension Headers. Address Resolution Protocol (ARP), RARP, DHCP. The Network Layer in the ATM Networks: Routing and Switching, Traffic Shaping, Congestion Control, ATM LANs.

Lectures 10, Marks 20

UNIT V

Transport layer: The Internet Transport Protocols: TCP: Services, Features, Segments, Connections, Flow control, Error Control, congestion Control, UDP. QOS (Quality of Services) ATM AAL layer protocol.

Application layer: Network security, Domain Name system, SNMP, Electronic Mail; the World Wide Web, Multi media.

Lectures 10, Marks 20

References:

1. Andrew S Tanebaum - Computer Networks, 4th Ed. PHI/ Pearson education.
2. Behrouz A Forouzan - Data Communication and Networks, 3rd Ed. TMH.
3. S. Keshav - An Engineering approact to Computer Networks, 5th Ed. Pearson.
4. W.A. Shay - Understanding communication and Networks, Thomson.
5. Irvine Olifer - Computer Networks: Principles, Technology and Protocols, Wiley India.
6. William Stalling – Data and Computer communications, 7th Ed. PHI

Term Work: It is 50% based on theory and 50% based on minimum FIVE assignments on above syllabus (one assignment for each unit)

W.E.F : 2008- 09

TERM - I

DATA COMMUNICATION AND DESIGN (ELECTIVE I)

Teaching scheme:
Lectures: 4 hrs / week
Practical: 2 hrs / week

Examination scheme:
Theory Paper: 100 Marks (3 Hours)
Practical : 25 Marks
Term work : 25 Marks

UNIT I

Digital Transmission Fundamentals

Digital signals, Limits of achievable data rate in digital communication, Data communication – components, data representation , Transmission impairment throughput, propagation speed, propagation time, wavelength, Attenuation distortion, delay distortion, Thermal noise , Inter modulation noise , Impulse Noise, Cross talk, channel capacity, source coding, data Rate, and channel capacity. Lectures 10, Marks 20

UNIT II

Digital Modulation

Modems, Digital continuous wave modulation techniques for Modem , Baud rate, QAM modern constellation patterns, Telephone modems- Modern stard,, traditional modems, 56M modems, Interface control for typical modem, EIA 232 / V.24 interface, interfacing with computer , Broad b modems. Cable modems. Lectures 10, Marks 20

UNIT III

Switching techniques High Speed Digital Access

Different switching techniques, circuit switching telephone , Signaling systems 1H Architecture overview , Packet switching N/w. T1 carrier system / E1 / , T3 / E3 carriers, SONET/ SDB, SDL Technical , ADSL technology, cellular Telephone systems, Lectures 10, Marks 20

UNIT IV

Data communication Media

Transmission media guided transmission media (Physical description , application , transmission char.) Twisted pair (unshielded , shielded , twisted pair) , category 3 , 5 , 5E , 6 . UTP, coaxial cable. Wireless transmission unguided media; (Terrestrial microwave satellite microwave) fiber optic communication, satellite communication. , wireless fidelity Lectures 10, Marks 20

UNIT V

Ethernet

Traditional Ethernet, fast Ethernet, gigabit Ethernet. Multiple access, rom access, MA, CSMA/ CD , CSMA/CA, control access, FDMA, TDMA, CDMA, . IEEE 802.3, 802.4, 802.5, X.21, X.25, SDLC/HDLC protocol stards. Introduction to N/w connecting devices, bridge , router, gateway, hub, etc. Lectures 10, Marks 20

Reference Book:

1) Behrouz A, Forouzan -Data communication, TMH
2) Stallings W. - Data Computer communication , PHI 6th Ed.
3) Shay W - Understanding Data communication and Networks, 3rd Ed., Thomson
4) Godbole A - Data communications, TMH

List of Practical:

1. Implementation of LAN using star topology and connectivity between two computers using crossover UTP5 cable.
2. To establish internet connectivity using dial up modem on windows system.

3. Study of network components such as Preparation of various cables, information attenuator, hubs, switches, bridges, routers, gateways, color codes of AT and T (2 Practicals)
4. Study of MODEM Trainer kit
5. Study of RAM for MODEM
6. Study of CDMA Trainer
7. study of GSM Trainer

Note: Minimum EIGHT practicals are to be performed

Teaching scheme:
Lectures: 4 hrs / week
Practical: 2 hrs / week

Examination scheme:
Theory Paper: 100 Marks (3 Hours)
Practical : 25 Marks
Term work : 25 Marks

UNIT I

Modern Imaging System:

Principles of NMR Imaging systems, Image reconstruction technique, Basic NMR components, biological effects of NMR imaging, Advantages, diagnostic ultrasound, physics of ultrasound waves, Medical ultrasound, Basic Pulse Echo Apparatus, A-scan, M- mode, B-scan, Real time Ultrasonic imaging system, Biological effects of ultrasound, Medical thermography, Physics of thermography, Infrared Detector, pyro-electric vidicon camera etc. Lectures 10, Marks 20

UNIT II

Cardiac Pacemakers and Defibrillators:

Need for pacemakers, external pacemakers, and Implantable pacemakers, recent developments, pacing system analyzer, need for defibrillators, DC defibrillators, Implantable defibrillators, and Defibrillators analyzers. Blood gas analyzers Acid base balance, Blood pH measurement, measurement of blood PCO_2, Blood PO_2 measurement, intra arterial blood gas monitoring, and complete gas analyzers, types of blood cells, coulter counters, and Auto recognition and differential counting of cells.

Lectures 10, Marks 20

UNIT III

Instruments for Surgery:

Principle of surgical diathermy, surgical diathermy machine, safety aspects, surgical diathermy analyzers, LASER, pulsed RUBY laser, Nd - YAG laser, He-Ne laser, Argon laser, CO_2 laser, laser safety, microwave diathermy, ultrasonic therapy unit,, pain relief through electrical simulation. Lectures 10, Marks 20

UNIT IV

Heamo-dialysis Machines and ventilators:

Function of kidneys, Artificial kidney , Dialysers, Membranes for Heamo-dialysis Heamo-dialysis Machine, Portable kidney machine, Mechanics of respiration Artificial ventilation , ventilators Types, ventilator terms, classification of ventilators Modern ventilators, HF ventilators, Humidifiers, Nebulisers and Aspirators. Lectures 10, Marks 20

UNIT V

Biomedical Telemetry and telemedicine:

Introduction, physiological parameters adaptable, wireless telemetry, single channel, Multi-channel, multi–patient telemetry, components of Bio-telemetry system, Implantable telemetry, Transmission of Analog and physiological signals over telephone , Telemedicine. Spectro-photometry, colorimeters, Automated Biochemical analysis. Infusion Pumps, Implantable Infusion systems. Lectures 10, Marks 20

References:

1. Cromwell - Biomedical Instrumentation, Pearson
2. Khandpur - Handbook of Biomedical Instrumentation
3. Webster - Biomedical Instrumentation, Wiley

List of Practical:

1. Measurement of echo with ultrasound system.
2. Study of Internal Pacemaker.
3. Study of Pacemaker simulator.
4. Measurement of pacing pubes with the pacemaker system.
5. Study of ON - DEMAND pacemaker system
6. Measurement of blood cell count.
7. Study of Surgical diathermy machine.

8. Study of Heamo dialysis Machine
9. Study of Nebulisers.
10. Measurement of Heart beats by wireless telemetry system.
11. Study of Ultrasonic therapy machine.
12. Study of Spectrophotometer.

Note: Minimum EIGHT practicals are to be performed

NORTH MAHARASHTRA UNIVERSITY JALGAON
B.E. (ELECTRONICS AND COMMUNICATION, ELECTRONICS AND TELECOMMUNICATION)

W.E.F : 2008- 09

TERM - I
SYSTEM PROGRAMMING (ELECTIVE I)

Teaching scheme:
Lectures: 4 hrs / week
Practical: 2 hrs / week

Examination scheme:
Theory Paper: 100 Marks (3 Hours)
Practical : 25 Marks
Term work : 25 Marks

UNIT I

Introduction to system software: Types of Software and Application Software Spectrum of system Software, Need of system Software, Assembler, Loader, Compiler. Symbolic Debuggers, Interpreter, Macro, Operating system and its types. Assembler- Structure of Assembler, Basic Functions, Assembler directives, Types of Assembler, General design specification of an Assembler, Purposes of Passes, Databases for Passes, Literals, Design of Pass I and Pass II Assembler.

Lectures 10, Marks 20

UNIT II

Data Structure -Stack Array, Queue, Link list, Data Structure, Sorting Technique, Linear and binary search. Macro and Macroprocessor- Macro definition and call, Features of macro, Macro expansion, Nested Macros, Design of Macroprocessor single pass and two pass macroprocessor. Lectures 10, Marks 20

UNIT III

Loader and Linkage editor- Basic functions of Loader, Relocation and Linking concepts, and different Loader schemes, other Loader schemes, binders, Linking Loaders, overlay Dynamic Binders, Design issue of Direct Linking Loaders. Compiler- Concept, Phases of compiler, Types of complier, Parser, Parsing technique, Top-down and Bottom-up parsing, Shift reduce and recursive descent parser, Operator precedence parser, Predictive parser, L-R parser. Lectures 10, Marks 20

UNIT IV

Operating System Concepts- Need of OS, Types of OS, like Batch, Time sharing, Multiprogramming, Multitasking real time and personal OS.

Process Concepts and Management: - Process concepts, process state, process state Transition, PCB, operation on process, OS Services for Process Management.

Deadlocks - Principals, Detections, Preventions Recovery and Avoidance Algorithm. Scheduling - Process scheduling long term, middle term and short term scheduling CPU burst, scheduling algorithm and performance evolution.

Lectures 10, Marks 20

UNIT V

Memory Management -Concept of Memory management, Contiguous Memory allocation, paging and segmentation concepts, , virtual memory concept. File Management- File concepts, Access Methods, Directory Structure, single, two, three level structure, Protection, file sharing allocation methods. Dynamic Linking In Windows- (Introduction and concepts only) clipboard, OLE terminology and Technology, Dynamic Data Exchange Dynamic Linking Libraries (DLL) Lectures 10, Marks 20

References:

1. Jhon J. Donovan - System Programming, TMH.
2. Dhamdhere - System Programming and Operating System, TMH, 2nd Ed.
3. L Beck - System Software, Pearson, 3rd Ed.
4. Aho Ulman - Complier Construction, Pearson LPE.
5. Silberschatz, Galvin, Gagne.- Operating System Principles , John Wiley and Sons, 7th Ed(Wiley India).
6. Tanenbaum - Modern Operating System, Pearson, 2nd Ed.
7. J.P. Bennett - Compiling Technique, TMH

List of Practical:

1. Language Programming for 8085 / 8051.
2. Implementation of sorting method (Any two) in C / C++.
3. Implementation of searching methods (Linear and Binary Search) in C / C++.
4. Implementation of stack/queue using linked list data structure in C / C++.
5. Develop an application to simulate first pass of two pass assembler for 8085 Microprocesser.
6. Design of simple Loader.
7. Design of Parser for a subset of C by using C / C++.
8. Design of Line and Screen Editor in C / C++.
9. Design of Microprocessor (Nested Macro Calls within definition) in C / C++.
10. Implementation of CPU Scheduling algorithm,
11. Implementation of memory management algorithm.
12. Implementation of interprocess Communication.

Note: Minimum EIGHT practicals are to be performed

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TERM - I
VLSI DESIGN (ELECTIVE I)

Teaching scheme:
Lectures: 4 hrs / week
Practical: 2 hrs / week

Examination scheme:
Theory Paper: 100 Marks (3 Hours)
Practical : 25 Marks
Term work : 25 Marks

UNIT I

Introduction:

History of HDL: Brief history of VHDL, brief history of Verilog. Structure of VHDL and Verilog module: Structure of Entity / Module, Port. Operators in VHDL and Verilog: Logical, Relational, Arithmetic Shift and Rotate Operators. Data types of VHDL and Verilog. Types of Architecture use in VHDL and Verilog: Behavioral Description, Structural Description, Switch level Description, Data-flow Description, Mixed-type Description. Simulation and Synthesis and comparison between them.

Lectures 10, Marks 20

UNIT II

Data-flow Description (VHDL / Verilog): Structure of Data-flow Description: Signal declaration and Signal assignment statements, Concurrent Signal assignment statements, Constant declaration and assignment statements, Assigning a delay to the signal assignment statements, VHDL / Verilog Programming using Data-flow description and Common errors occurs during programming.

Behavioral Description (VHDL / Verilog): Structure of Behavioral Description for both VHDL/Verilog. VHDL variable assignment statement. Sequential statements for VHDL / Verilog: IF statement, Signal and variable (only for VHDL) assignment, Case statement, Loop statement. VHDL/ Verilog Programming using Behavioral description and Common errors occur during programming. Lectures 10, Marks 20

UNIT III

i) Structural Description (VHDL / Verilog): Organization of structural design, Binding, State machines, Generic (VHDL), Parameter (Verilog), VHDL / Verilog Programming using Structural description and Common errors occurs during programming.

ii) Switch Level Description (VHDL / Verilog): Single NMOS and PMOS switches: NMOS and PMOS switch description for VHDL / Verilog, Serial and parallel combinations of switches. Switch level description of: Primitive gates, Combinational logics, Sequential circuits. CMOS switch. Bidirectional switches.

iii) Procedures (VHDL), Task (Verilog) and Functions (VHDL / Verilog) Lectures 10, Marks 20

UNIT IV

Mixed type Description (VHDL / Verilog): User defined data types in VHDL, VHDL Packages, Implementation of Arrays, and Mixed-type Description Programming.

Advanced HDL Description (VHDL / Verilog): File processing in VHDL / Verilog. VHDL record types. Programming of File processing for VHDL / Verilog.

Architecture of Xilinx 9500 series CPLD. Lectures 10, Marks 20

UNIT V

Xilinx Spartan 4000 series FPGA.

Testing of Logic Circuits:

Fault model, path sensitizing, random test. Design of testability, BIST (Built in self test), Boundary scan test.

Introduction to various Debugging Tools .Introduction to Simulation Tools.

Introduction to Digital Pattern Generator and Logic Analyser. Advantage of Logic Analyzer with built in Digital Pattern Generator over Simulator. Lectures 10, Marks 20

References:

1. John F. Wakerly - Digital Design, Principles and Practices, Pentice Hall Publication.
2. Nazeib M. Botros - HDL programming Fundamentals VHDL and Verilog , Thomson.
3. Stephen Brown and Zvonko Vranesic - Fundamentals of Digital Logic with VHDL design, McGraw Hill
4. Douglas Perry - VHDL , Tata MC-Graw Hill
5. Xilinx data manual - The Programmable Logic data Book
6. Sudhakar Yalamanchil - An Introduction to VHDL from Synthesis to Simulation
7. Bhaskar – A VHDL Primer, Pearson
8. Zwolinski – Digital System Design with VHDL, Pearson

List of Practical:

Minimum EIGHT Practical on VHDL / Verilog coding, simulation and synthesis with implementation on CPLD / FPGA devices. and test performance using 32 channel pattern generator integrated with logic analyzer apart from verification by simulation with tools . Use the pattern generator to generate input signal and truth tables. (PC Based instruments may also be used)

Simulation, Synthesis, and Implementation and observe Real-time validation using pattern generator and Integrated logic Analyzer:

Group A. Combinational Logic: (At least THREE of the following must be covered)

1. Write VHDL code to realize all the logic gates

2. Write a VHDL program for the following combinational designs
    a. 2 to 4 decoder
    b. 8 to 3 (encoder without priority & with priority)
    c. 8 to 1 multiplexer
    d. 4 bit binary to gray converter
    e. Multiplexer, demultiplexer, comparator

3. Write a VHDL code to describe the functions of a Full Adder Using following modeling styles.
4. Write VHDL code to display messages on the given seven segment display and LCD and accepting Hex key pad input data

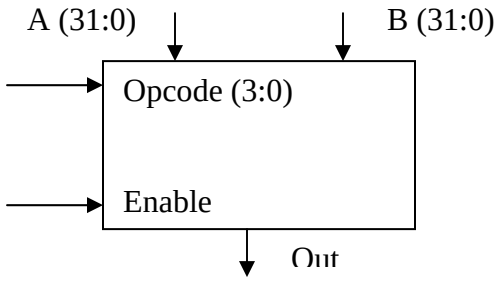
Group B. Sequential logic: (At least THREE of the following must be covered)

1. Develop the VHDL codes for the following flip-flops,
   SR, D, JK, T.

2. Design 4 bit binary, BCD counters (Synchronous reset and Asynchronous reset) and "any sequence" counters.
3. Implementation of 8 – Bit Left / Right Shift Register.

Group C. Implement 32 bit ALU for any (Arithmetic / Logical) Function.
(At least ONE of the following must be covered)

Write a model for 32 bit ALU using the schematic diagram shown below.(example only)



- ALU should use combinational logic to calculate an output based on the four bit op-code input
- ALU should pass the result to the out bus when enable line in high, and tri-state the out bus when the enable line is low.
- ALU should decode the 4 bit op-code according to the given in example below

OPCODE	ALU OPERATION
1.	A + B
2.	A - B
3.	A Complement
4.	A * B
5.	A AND B
6.	A OR B
7.	A NAND B
8.	A XOR B

Group D. INTERFACING (At least Two of the following must be covered)

1. Write VHDL code to control speed, direction of DC and Stepper motor
2. Write VHDL code to accept 8 channel Analog signals, Temperature sensors and display the data on LCD panel or seven segment displays.
3. Write VHDL code to generate different waveforms (Sine, Square, Triangle, Ramp etc.,) using DAC change the frequency and amplitude.
4. Write VHDL code to simulate Elevator operations
5. Write VHDL code to control external lights using relays.

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TERM - I

BROADBAND COMMUNICATION (ELECTIVE I)

Teaching scheme:
Lectures: 4 hrs / week
Practical: 2 hrs / week

Examination scheme:
Theory Paper: 100 Marks (3 Hours)
Practical : 25 Marks
Term work : 25 Marks

UNIT I

Switching Techniques:

Introduction, circuit switching, Routing for circuit switching networks, control signaling. Common channel signaling, Packet switching, Packet size, X.25 protocol, packet level, sequence of events. Comparison of circuit and packet switching.

Lectures 10, Marks 20

UNIT II

Frame Relay:

Introduction, Frame relay protocols, architecture, comparison with X.25 protocol, frame mode call control, call control protocol. Frame relay congestion control, Congestion, Approaches, traffic rate management, explicit congestion avoidance, implicit congestion control.

Lectures 10, Marks 20

UNIT III

ISDN:

Introduction to ISDN, IDN, Principles of ISDN, Evolution of ISDN, ISDN Standards, Architecture, Transmission structure, User network interface configuration, ISDN protocol architecture, ISDN Connection, Addressing. Inter Networking ISDN – ISDN, ISDN – PSTN, ISDN – CSPDN.

Lectures 10, Marks 20

UNIT IV

ATM:

Overview, Virtual channels, Virtual paths, VP and VC switching, ATM cells, Header format, Generic flow control, Header error control, Transmission of ATM cells, Adaptation layer, AAL services and protocols. ATM switching building blocks, ATM cell processing in a switch, Matrix type switch, Input, Output buffering, central buffering, Performance aspects of buffering switching networks. Lectures 10, Marks 20

UNIT V

Broadband standards:

Broadband ISDN Standards, Broadband Services, Broadband Architecture, User network interface. Broad band ISDN protocol, architecture, physical layers, SONET / SDH. Lectures 10, Marks 20

References:

1) Williams stallings - ISDN and Broadband ISDN with frame Relay and ATM , PHI , 4/E
1) Mischa Schwartz - Broadband Internet Network, PHI
2) Bernand Forozen. - Data Communication. and Networking, TMH
3) Balaji kumar - Broadband Communication, MGH

List of Practical:

- Simulation of any one of the PSTN switch Configuration (T / S / T Switch)
- Implementation of congestion control algorithm
- Implementation of routing algorithm (Shortest path)
- Case Study – ISDN – ISDN and ISDN - PSTN

Note: Minimum EIGHT practicals are to be performed, based on the syllabus.

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TERM - I

PROJECT I

Teaching scheme:
Practicals: 2 hrs / week

Examination scheme:
Oral : 25 Marks
Term Work : 25 Marks

1. Every student individually or in a group (group size is of 3 students. However, if project complexity demands a maximum group size of 4 students, the committee should be convinced about such complexity and scope of the work.) shall take a project in the beginning of the (B.E. first Term) seventh term in consultation with the guide and the project must be completed in the (B.E. Second Term) eighth term.

2. The project proposal must be submitted in the institute in the beginning of the (B.E. first Term) seventh term. While submitting project proposal care is to be taken that project will be completed within the available time of two term i.e 2 Hrs per week for (B.E. first Term) seventh term and 4 Hrs per week for (B.E. Second Term) eighth semester (total time become 12*2 + 12*4 = 72 Hrs per project partner). The final title of the project work should be submitted at the beginning of the (B.E. Second Term) eighth semester. .

3. Project title should be precise and clear. Selection and approval of topic:

   Topic should be related to real life application in the field of Electronics and Telecommunication

   OR

   Investigation of the latest development in a specific field of Electronics or Communication or Signal Processing

   OR

The investigation of practical problem in manufacture and / or testing of electronics or communication equipments

OR

The Microprocessor / Microcontroller based applications project is preferable.

OR

Software development project related to VHDL, Communication, Instrumentation, Signal Processing and Agriculture Engineering with the justification for techniques used / implemented is accepted.

OR

Interdisciplinary projects should be encouraged. The examination will be conducted independently in respective departments.

4. The group should maintain a logbook of activities. It should have entries related to the work done, problems faced, solution evolved etc., duly signed by guide.

5. The group is expected to complete details system design, layout etc. in (B.E. first Term) seventh term, as a part of term work in the form of a joint report. Project report must be submitted in the prescribed format only. No variation in the format will be accepted.

6. One guide will be assigned at the most three project groups.

7. The guides should regularly monitor the progress of the project work.

8. Assessment of the project for award of TW marks shall be done by the guide and a departmental committee (consisting of minimum two teachers with experience more than three years) as per the guidelines given in the following table.

A) ASSESSMENT OF PROJECT I TERMWORK B.E. FIRST TERM

NAME OF THE PROJECT _____
NAME OF THE GUIDE: _____

Sr No	Exam Seat No	Name Of Student Marks	Assessment by guide (70%)					Assessment by Departmental committee (30%)			Grand Total	Out of 25 Marks
			Literature survey	Topic Selection	Documentation	Attendence	Total	Evaluation (10%)	Presntaion (20%)	Total		
			10	05	15	05	35	05	10	15	50	25

Sign of Guide Sign. of Committee Members Sign. of H. O. D.

9. The guide should be internal examiner for oral examination (If experience is greater than three years).

10. The external examiner should be from the related area of the concerned project. He should have minimum of five years of experience at degree level / industry.

11 .The evaluations at final oral examination should be done jointly by the internal and external examiners.

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TERM - I
SEMINAR

Teaching scheme:
Practical: 2 hrs / week

Examination scheme:
Term Work : 25 Marks

1. For seminar every student will individually study a topic assigned to him / her and submit a report and shall deliver a short lecture / Seminar on the topic at the end of term.
2. Selection of topic should be done by students in consultation with concerned guide
    a. Topic should be related to branch but it should be extended part of the branch (latest and advance topic).
    b. The topic should be such that the student can gain latest knowledge. Student should preferably refer at least one research paper
3. Seminar topic should not be repeated in the department and registration of the same should be done on first come first served basis
4. Seminar report should be submitted in paper bound copy prepared with computer typing
    a. Size of report depends on advancement of topic.
    b. Student should preferably refer minimum 5 reference books / magazines.
    c. Format of content
        i. Introduction.
        ii. Literature survey.
        iii. Theory 1) Implementation 2) Methodology
            3) Application 4) Advantages, Disadvantages.
        iv. Future scope.
        v. Conclusion.

5 ASSESSMENT OF SEMINAR for TERM WORK
Title of seminar: _____
Name of guide : _____

Sr.	Exam	Name of	Assessment by examiners	Grand

No.	Seat No.	Student	Topic Selection 5	Literature Survey 5	Report Writing 5	Depth of understanding 5	Presentation 5	Total 25

6 . Assessment of Literature survey will be based on
   a. Collection of material regarding history of the topic.
   b. Implementation.
   c. Recent applications.

7. Assessment of Depth of understanding will be based on
   a. Questioning by examiners.
   b. Questioning by students.
   c. What the student understands i.e. conclusion regarding seminar.

8. Assessment of presentation will be based on;
   a. Presentation time (10 minutes)
   b. Presentation covered (full or partial)
   c. Way of presentation
   d. Questioning and answering (5 minutes)

9. Examiners should be a panel of two one of them must be guide. Examiner must have experience at least 3 years. Examiners will be appointed by HOD in consultation with Principal.

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TERM - II
TELEMATICS

Teaching scheme:
Lectures: 4 hrs / week
Practical: 2 hrs / week

Examination scheme:
Theory Paper: 100 Marks (3 Hours)
Oral : 25 Marks
Term work : 25 Marks

UNIT I

Telephone switching and Traffic Engineering:

Evolution of telecommunication, simple telephone communication, basics of switching systems Dialing mechanism, electronics switching, digital switching system, SPC configuration , Architecture features, centralized and distributed SPC, enhanced services.

Traffic Engineering, Introduction, Traffic usages, traffic measurement unit, traffic distribution, Grade of service Blocking probability, Numericals on above topics. Lectures 10, Marks 20

UNIT II

Switching networks

Single stage and multistage switching N/W, blocking probability, Lee's model to evaluate blocking probability of three stage network , concept of time division time switching, time multiplexed time and space switching, combination switch ST, TS, STS, TST stages, Brief description of combination switching. Lectures 10, Marks 20

UNIT III

Mobile cellular Telephony:

Limitations of conventional mobile Telephone system, Frequency band allocation, Basic cellular system components, operations of a cellular. Calculation of maximum number of calls per hour per cell, frequency channels per cell, concept of frequency reuse, cell splitting: Hand off mechanism, Delayed hand off, Forced hand off. Mobile assisted hand off. Cell site hand off, Inter system hand off, co-channel Interference reduction factor, fading. Multi-user communication . TDMA, FDMA and CDMA. Lectures 10, Marks 20

UNIT IV

Digital cellular systems:

GSM, radio aspects, features of GSM. Architecture details channel structure, security aspects, Authentication and ciphering key. Different call flow sequences in GSM, North American CDMA cellular standard , radio aspect, forward link and Reverse link structure, key features of standard. Lectures 10, Marks 20

UNIT V

IP telephony

Introduction to VOIP, low level protocols, - RTP / RTCP / UDP, voice activity detection and discontinuous transmissions. IP telephony protocols: - H.323 standard, session Initiation protocol (SIP), Gateway location protocol, QOS requirements, RSVP Architecture, message format , reservation merging. Lectures 10, Marks 20

References :

1. Vishwanathan - Telecommunication switching systems
2. William C.Y. LEE - Wireless and cellular Telecommunications, MGH ,3rd Ed.
3. Raj Pandya - Mobile and personal communication systems , PHI
4. Rappaport - Wireless communication , PHI
5. Alberto Leon Garcia - Communication network, TMH
6. Andreas F. Molisch - Wireless communication, Wiley

List of Practical:

1. Study of Electronic Telephone exchange (C-Dot OR E-10B)
2. Traffic Measurement calculations
3. Mobile Transmitter and Receiver (Trainer Kit)
4. To study GSM architecture
5. To Study cordless Telephone system
6. To study CDMA
7. To study VOIP
8. To study RSVP Architecture.
9. Study of DTMF signaling including DTMF decoder
10. Study of GSM AT commands.

Note: Minimum EIGHT practicals are to be performed

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TELEVISION AND CONSUMER ELECTRONICS

Teaching scheme:
Lectures: 4 hrs / week
Practical: 2 hrs / week

Examination scheme:
Theory Paper: 100 Marks (3 Hours)
Practical : 25 Marks
Term work : 25 Marks

UNIT I

Basic concept of Television: TV broadcasting, Scanning methods, Synchronization, Aspect ratio, Kell factor, Horizontal and Vertical resolution, video bandwidth, positive and negative modulation. Composite video signal. Camera Tubes: Image Orthicon, Vidicon, Plumbicon, Saticon, Silicon diode array, Television transmission: VSB transmission, TV channels, TV standards, TV Channels bands, block diagram of monochrome TV receiver. Lectures 10, Marks 20

UNIT II

Colour Television receivers: Colour fundamentals, compatibility, frequency interleaving, colour mixing. Colour camera tube, picture tubes – static and dynamic convergence, colour purity. PAL, SECAM, NTSC system concept, encoder and decoder and their comparison. Colour TV transmitter and receiver block diagram. Lectures 10, Marks 20

UNIT III

Advanced TV system and techniques: Introduction to digital compression technique : GPEG, MPEG.,Block diagram of digital TV:- transmitter and receiver, HDTV- transmitter and receiver, DTH system, Video on demand. Introduction of Plasma and LCD TV. Cable TV. Introduction of 3D DTV system. CCTV, digital terrestrial TV (DTT). Lectures 10, Marks 20

UNIT IV

Methods of sound, video recording and reproduction: Disc recording, magnetic recording, optical recording- CD and DVD. Monophony, stereophony, Hi-Fi system. PA system: Block diagram, requirement, characteristics, its planning for various uses. Introduction to satellite radio reception (word space) Lectures 10, Marks 20

UNIT V

Modern Home Appliances : Block Diagram and working of FAX Machine, Washing Machine, Microwave Oven, Video Games, CD and DVD players, Digital diary. Internet Applications: E-mail, FTP, WWW. Solar Cells and Panels. Introduction to Palm Top, Pen Drive. Lectures 10, Marks 20

References:

1. A. M. Dhake - TV and Video Engineering , TMH
2. R. G. Gupta - TV Engineering and Video system , TMH
3. Kelth Jack - Video Demisified , Penram International
4. S. P. Bali - Colour TV Theory and Practice , TMH
5. Bernard Grobb, Charles E - Basic TV and Video system , TMH (sixth Edition)
6. R. R. Gulati - Monochrome and colour TV , New Age
7. Philips Handbooks on Audio, Video and Consumer Electronics application notes
8. Olson - High Quality Sound recording and reproduction

List of Practical:

1. Study of colour TV Receiver
2. Voltage and Waveform analysis for colour TV.
3. Alignment and fault finding of colour TV using wobbuloscope and pattern generator (02 Expts.)
4. Study of DTH and Set Top Box.
5. Study of CD / DVD player.
6. Practical Visit to TV transmitter / Studio.
7. Study of PA system with cordless microphone.
8. Study of Audio System, MP3 player, Satellite radio.
9. Study of HDTV.
10. Study of Digital TV.
11. Web page designing.
12. Study of Tape recorder

Note: Minimum EIGHT practicals are to be performed

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TERM - II
SATELLITE COMMUNICATIONS

Teaching scheme:
Lectures: 4 hrs / week
Practical: 2 hrs / week

Examination scheme:
Theory Paper: 100 Marks (3 Hours)
Term work : 25 Marks

UNIT I

Introduction: General background, frequency allocations for satellite services, basic satellite system, system design considerations, applications. Satellite Orbits: Introduction, laws governing satellite motion, orbital parameters, orbital perturbations, Doppler effects, geostationary orbit, antenna look angles, antenna mount, limits of visibility, Earth eclipse of satellite, sun transit outage, inclined orbits, sun-synchronous orbit, launching of geostationary satellites.

Lectures 10, Marks 20

UNIT II

Wave Propagation and Polarization: Introduction, atmospheric losses, ionospheric effects, rain attenuation, other impairments, antenna polarization, polarization of satellite signals, cross polarization discrimination, ionospheric depolarization, rain depolarization, ice depolarization. Satellite Antenna: Antenna basics, aperture antennas, parabolic reflectors, offset feed, double reflector antenna shaped reflector systems. Lectures 10, Marks 20

UNIT III

Link Design: Introduction, transmission losses, link power budget equation, system noise, carrier to noise ratio for uplink and downlink, combined uplink and downlink carrier to noise ratio, intermodulation noise. Multiple Access Techniques: Introduction, FDMA, TDMA, FDMA / DMA, operation in a multiple beam environment, CDMA, multiple access examples .

Lectures 10, Marks 20

UNITT IV

Satellite Transponder: Transponder Model, Satellite front end, RF filtering of digital carrier, Satellite signal processing Transponder limiting. Communication Satellites: Introduction, design considerations, lifetime and reliability, spacecraft sub systems, spacecraft mass and power estimations, space segment cost estimates. Earth Stations: Introduction, design considerations, general configuration and characteristics. Lectures 10, Marks 20

UNIT V

Non Geostationary Orbit Satellite Systems: Introduction, reasons, design considerations, case study, example of systems. Satellite Applications: INTELSAT Series, INSAT, VSAT, DBS Television and Radio, Remote sensing, Mobile satellite services: GSM and GPS, Satellite navigation system, DTH, Internet Connectivity, Video Conferencing.

Lectures 10, Marks 20

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References:

1. M. Richharia - Satellite Communications systems, Mc Millan publication ,2nd edition
2. Dennis Roddy - Satellite Communications, Mc-Graw Hill publication , 3rd edition
3. Timothy Pratt, Charles Bostian, Jeremy Allnut - Satellite communications , John Wiley & Sons , 2nd edition
4. J. Martin - Communication Satellite Systems, PH Publication.
5. Robert M. Gagliardi - Satellite Communication , CBS Publishers and Distributors , 2nd edition

Term Work: It is 50% based on theory and 50% based on minimum FIVE assignments on above syllabus (one assignment for each unit)

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TERM - II

EMBEDDED SYSTEM (ELECTIVE II)

Teaching scheme:
Lectures: 4 hrs / week
Practical: 2 hrs / week

Examination scheme:
Theory Paper: 100 Marks (3 Hours)
Practical : 25 Marks
Term work : 25 Marks

UNIT I

Embedded system Introduction:

Introduction to Embedded System, History, Design challenges, optimizing design metrics, time to market, applications of embedded systems and recent trends in embedded systems, embedded design concepts and definitions, memory management, hardware and software design and testing, communication protocols like SPI, SCI, I2C, CAN etc

Lectures 10, Marks 20

UNIT II

System Architecture:

Introduction to ARM core architecture, ARM extension family, instruction set, thumb Instruction set, Pipeline, memory management, Bus architecture, study of on-chip peripherals like I / O ports, timers, counters, interrupts, on-chip ADC, DAC, RTC modules, WDT, PLL, PWM, USB etc. Lectures 10, Marks 20

UNIT III

Interfacing and Programming:

Basic embedded C programs for on-chip peripherals studied in system architecture. Need of interfacing, interfacing techniques, interfacing of different displays including Graphic LCD (320X240), interfacing of input devices including touch

screen etc, interfacing of output devices like thermal printer etc., embedded communication using CAN and Ethernet, RF modules, GSM modem for AT command study etc. Lectures 10, Marks 20

UNIT III

Real Time Operating System Concept:

Architecture of kernel, task scheduler, ISR, Semaphores, mailbox, message queues, pipes, events, timers, memory management, RTOS services in contrast with traditional OS. Introduction to Ucos II RTOS, study of kernel structure of Ucos II, synchronization in Ucos II, Inter-task communication in Ucos II, memory management in Ucos II, porting of RTOS.

Lectures 10, Marks 20

UNIT V

Embedded Linux:

Introduction to the Linux kernel, Configuring and booting the kernel, the root file system, Root file directories, /bin, /lib etc., Linux file systems, Types of file system: Disk, RAM, Flash, Network. Some debug techniques- Syslog and strace, GDB, TCP / IP Networking- Network configuration, Device control from user space- Accessing hardware directly, Multi processing on Linux and Inter Process Communication- Linux process model and IPCs, Multithreading using pThreads - Threads verses Processes and pThreads, Linux and Real-Time Standard kernel problems and patches. Lectures 10, Marks 20

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References:

1. Rajkamal - Embedded Systems, TMH.
2. David Simon - Embedded systems software primer, Pearson
3. Steve Furber - ARM System-on-Chip Architecture, Pearson
4. Jean J Labrose - MicroC / OS-II, Indian Low Price Edition
5. DR.K.V.K.K. Prasad - Embedded / real time system, Dreamtech
6. Iyer, Gupta - Embedded real systems Programming , TMH
7. Steve Heath - Embedded System Design , Neuwans

LAB EXERCISE

- Integrated Development Environment Overview (Project creation, down load and debug)
- Study of JTAG Debugger/on-board debugger-emulator.
- ARM Instructions execution (Barrel Shifter, LDR / STR, SMT / LDM)

List of Practical:

GROUP - A

1) Writing basic C-programs for I / O operations
2) C-Program to explore timers / counter
3) C-programs for interrupts
4) Program to demonstrate UART operation

GROUP - B

5) Program to demonstrate I2C Protocol.
6) Program to demonstrate CAN Protocol.

GROUP - C

7) Program to interface LCD
8) Program to interface Keyboard and display key pressed on LCD

9) Program to interface stepper motor

GROUP - D

10) Program to demonstrate RF communication
11) Program to implement AT commands and interface of GSM modem
12) Implementation of USB protocol and transferring data to PC.
13) Implementation of algorithm /program for the microcontroller for low power modes.

uCOS II / Embedded Linux RTOS Examples

GROUP - E

14) Interfacing 4 x 4 matrix keyboards and 16 x 2 characters LCD displays to microcontroller / microprocessor and writing a program using RTOS for displaying a pressed key.
15) Writing a scheduler / working with using RTOS for 4 tasks with priority. The tasks may be keyboard, LCD, LED etc. and porting it on microcontroller/ microprocessor.

GROUP - F

16) Implement a semaphore for any given task switching using RTOS on microcontroller board.
17) Create two tasks, which will print some characters on the serial port, Start the scheduler and observe the behavior.

GROUP – G

18) RTOS based interrupt handling using Embedded Real Time Linux.
19) Program for exploration of (Process creation, Thread creation) using Embedded Real Time Linux.

GROUP – H

20) Program for exploring Message Queues using Embedded Real Time Linux.
21) Ethernet Based Socket Programming using Embedded Real Time Linux.

Note: 1) At least ONE practical should be performed from EACH GROUP.
2) TWO practical should be performed using the JTAG debugger / on-board Debugger- emulator.

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TERM - II

DIGITAL IMAGE PROCESSING (ELECTIVE II)

Teaching scheme:
Lectures: 4 hrs / week
Practical: 2 hrs / week

Examination scheme:
Theory Paper: 100 Marks (3 Hours)
Practical : 25 Marks
Term work : 25 Marks

UNIT I

Digital Image Processing:

Introduction, Examples of Fields that use Digital Image Processing, Fundamental Steps in Digital Image Processing, Components of Image Processing Systems, Image Sensing and Acquisition, Image Sampling and Quantization, Representing Digital Images, Spatial and Gray level Resolution, Basic pixel relationship, Distance Measures, Statistical Properties: Histogram, Mean, Standard Deviation, Introduction to DCT, Walsh, Hadamard, and Wavelet Transform.

Lectures 10, Marks 20

UNIT II

Image Enhancement:

Enhancement in Spatial Domain: Basic Gray Level Transformations, Histogram Processing, Enhancements using arithmetic and logical operations, Basics of Spatial Filtering, Smoothening and Sharpening Spatial filters, Enhancement in Frequency Domain: Smoothening and Sharpening frequency Domain Filters. Lectures 10, Marks 20

UNIT III

Image Coding and Compression:

Image Coding Fundamentals, Image Compression Model, Error Free Compression, VLC, Huffman, Arithmetic, RLC, Lossless Predictive Coding; Lossy-Compression, Lossy Predictive Coding, Transform Coding, Discrete Cosine Transform, Image Compression Standards, JPEG Baseline Coder Decoder. Lectures 10, Marks 20

UNIT IV

Image Restoration and Color Image Processing:

Image Degradation Model, Noise Models, and Restoration in Presence of Noise in spatial Domain, Linear Filtering, Inverse Filter, Wiener Filter, Constrained Least Square Restoration, Geometric Transformation, Spatial Transformation, and Grey Level Transformation. Color Image Processing, Color Image Fundamentals, Color models, RGB to HIS and vice versa, Color Transforms, Smoothing and Sharpening Lectures 10, Marks 20

UNIT V

Image Segmentation:

Image Segmentation: Point, line, Edge detection, Canny Edge Detection, Second Order Derivative, Hough Transform, Thresholding, Region Based Segmentation, Region Growing, Region Splitting and Merging, Image Representation, Chain Codes, Signature, Texture, Use of Principal Component for Description. Lectures 10, Marks 20

References:

1. Gonzalez and Woods - Digital Image Processing, Pearson Education.
2. Arthur Weeks Jr - Fundamentals of Digital Image Processing, PHI.
3. A. K. Jain - Digital Image Processing
4. Pratt - Digital Image Processing, Wiley
5. Castleman - Digital Image Processing, Pearson

List of Practical:

1. Study of different file formats e.g. BMP, TIFF and extraction of attributes of BMP.
2. Study of statistical properties- mean, standard deviation, profile, variance and Histogram plotting.
3. Histogram equalization and modification of the image.
4. Gray level transformations such as contrast stretching, negative, power law transformation etc.
5. Spatial Domain filtering- smoothing and sharpening filters.
6. DCT / IDCT of given image.
7. Edge detection using Sobel, Prewitt and Roberts operators.
8. Capturing image through grabber card from camera and Process it.
9. Pseudo coloring.
10. Converting color image to B / W image and vice versa
11. Creating noisy image and filtering using MATLAB

Note: Minimum EIGHT practicals are to be performed.

NORTH MAHARASHTRA UNIVERSITY JALGAON
B.E. (ELECTRONICS, ELECTRONICS AND COMMUNICATION, ELECTRONICS AND TELECOMMUNICATION)

W.E.F : 2008- 09

TERM - II

NEURAL NETWORK AND FUZZY SYSTEM (ELECTIVE II)

Teaching scheme:
Lectures: 4 hrs / week
Practical: 2 hrs / week

Examination scheme:
Theory Paper: 100 Marks (3 Hours)
Practical : 25 Marks
Term work : 25 Marks

UNIT I

Introduction:

Biological neurons and their artificial model. Models of neuron: McCulloch-pitts Model, Perceptron, Adaline ,Topology: Basic structures of artificial neural network , Basic learning laws: Hebb's law, Perceptron learning law, Widrow and Hoff LMS learning law, Correlation learning law, Instar and Outstar learning law, Learning Methods: Hebbains learning , Competitive learning, Differential competitive learning , Error correction learning, Reinforcement learning, Stochastic learning.

Lectures 10, Marks 20

UNIT II

Perceptron Layer Network:

Perceptron learning Rule. Perceptron architecture: Single neuron Perceptron, Multiple-Neuron perceptron. Training Multiple neuron Perceptron. Limitations of Perceptron.

Supervised Hebbian Learning:

Linear association, Hebbs rule, Performance analysis, Variation of Hebians rule. Performance Surfaces and Optimum points: Taylor's series, Directional derivatives, Necessary condition for Optimality. Lectures 10, Marks 20

UNIT III

Widrow - Hoff Learning:

ADALINE Network, Single ADALINE, Mean square error, LMS algorithm, Analysis of convergence, Adaptive Filtering: Adaptive noise cancellation, Echo cancellation.

Backpropogation Network:

Multilayer Perceptron: Pattern classification, Function approximation. Back propagation algorithm: Performance index, Chain rule, Back propagation the sensitivity. Lectures 10, Marks 20

UNIT IV

Fuzzy Mathematics:

Classical sets, fuzzy sets, Fuzzy set operations, Procedure of Fuzzy Sets, Crisp Relations, Fuzzy Relations, Operation of Fuzzy Relations , Fuzzy Tolerance and Equivalence Relations membership functions, Defuzzyfication Methods. Manipulation of Linguistic Variables. Lectures 10, Marks 20

UNIT V

Application of Neuro - fuzzy System : Introduction to Neuro - Fuzzy System. Types of Neuro – Fuzzy nets, Neuro – Fuzzy Systems Design and implementation.

Fuzzy classification by equivalence relations: C-means clustering, hardening relations from clustering, Fuzzy pattern recognitions. Control applications: Control system design stages, Control Surface, System Identification Problem, Simple Neuro - Fuzzy Logic Controller, Industrial applications. Lectures 10, Marks 20

Reference Books:

1 Fausett - Fundamentals of Neural networks : Architectures, Algorithnors Applications , Pearson
2 B. Yegnanarayana - Artificial Neural Networks, Prentice Hall of India, New Delhi
3 Martin T. Hagan - Neural Network Design , PWS Publishing company (A devision of International Thomson Publishing Inc.)
4 J.M. Zurada - Introduction to Artificial Neural Network, Jaico Publishing House
5 Meherotra Kishan ,Mohan C.K, Ranka Sanjay - Elements Of Artificial Neural networks, Penram Int Pub Mumbai.
6 D.E Goldberg , Addision - Genetic Algorithm in Search Optimization and Machine Learning, Wesley Publication
7 Kalyanmoy Deb - Optimization for Engineering Design Algorithms and Examples, Prentice Hall of India New Delhi
8 George J. Klir / Bo Yuan - Fuzzy Sets And Fuzzy Logic, Prentice Hall of India New Delhi / Pearson
9 T. J. Ross - Fuzzy Logic With Engineering Application , McGraw hill Inc. 1995.

Practical: All the Practicals are based on Any Concerns Software .

1. Design and implementation of artificial neural network to compute XOR for two inputs using feedback artificial neural network.
2. Design a perceptron network to solve Classification problem with different classes of input vectors.(Take two or more classes of input vectors)
3. Design the Perceptron model for pattern recognition. (Take prototype pattern as example)
4. Simulate Adaline algorithm.
5. Implement Back-propagation simulator.
6. Find out the Fuzzy Relation of the given Fuzzy Sets.
7. Verify any one Defuzzification method.
8. Fuzzy pattern recognition.
9. Design any control system using fuzzy logic in simulink

Note: Minimum EIGHT practicals are to be performed.

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B.E. (ELECTRONICS AND COMMUNICATION, ELECTRONICS AND TELECOMMUNICATION)

W.E.F : 2008- 09

TERM - II

TELECOMMUNICATION NETWORK MANAGEMENT (ELECTIVE II)

Teaching scheme:
Lectures: 4 hrs / week
Practical: 2 hrs / week

Examination scheme:
Theory Paper: 100 Marks (3 Hours)
Practical : 25 Marks
Term work : 25 Marks

UNIT I

Foundations and TMN architecture:

Network management standards, network management model, organization model, information model, abstract syntax notation 1 (ASN. 1), encoding structure, macros, functional model. Terminology, functional TMN architecture, Information architecture, physical architecture, TNN tube, TMN and OSI Lectures10, Marks 20

UNIT II

Network management application functional requirements:

Configuration management, fault management, performance management, error correlation technology, security management, accounting management, service level management, management service, community definitions, capturing the requirements, simple and formal approaches, semi formal and formal notations Lectures10, Marks 20

UNIT III

Information service element and modeling for TMN:

CMISE model, service definitions, errors, scooping and filtering features, synchronization, functional units, association services, common management information protocol specification. Rationale for information modeling, management information model, object oriented modeling paradigm, structure of management information, managed object class definition, management information base (MIB) Lectures10, Marks 20

UNIT IV

Simple Network Management Protocol:

SNMPv1: managed networks, SNMP models, organization model, information model, SNMPv2: communication model, functional model, major changes in SNMPv2, structure of management information (SMI), MIB, SNMPv2 protocol compatibility with SNMPv1, SNMPv3: architecture, applications, MIB security, remote monitoring SM and MIB, RMON1 and RMON2.
Lectures10, Marks 20

UNIT V

Network management examples and tools:

ATM integrated local management interface, ATM, MIB M1, M 2, M 3, M 4 interfaces, ATM digital exchange interface management, digital subscriber loop (DSL) and asymmetric DSL technologies, ADSL configuration management, performance management, network statistics management, network management system, management platform case studies: OPENVIEW, ALMAP Lectures10, Marks 20

References:

1. Mani Subramanium - Network management principles and practice , Pearson Education

2. Lakshmi Raman - Fundamentals of Telecommunication Network Management, PHI
3. Airdarous Salah - Telecommunication Network Management Technologies and implementations, Thomas (PHI)

List of Practical:

1. Connectivity of LAN computer to internet using dial up modem / leased line modem (installing and configuration)
2. Installation and configuration of network application like telnet.
3. Users creation, rights assignment, mappling drives, sharing files, printers etc using SNMP. Study and analysis of network
4. Design and implementation of network based on number of nodes and traffic.
5. Implementation of routing algorithms (software based) any TWO practicals, (shortest path)
6. Implementation of encryption and decryption (software based)
7. Campus networking – case study

Note: Minimum EIGHT practicals are to be performed, based on above syllabus.

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B.E. (ELECTRONICS, ELECTRONICS AND COMMUNICATION, ELECTRONICS AND TELECOMMUNICATION)

W.E.F : 2008- 09

TERM - II

NANO –TECHNOLOGY (ELECTIVE II)

Teaching scheme:
Lectures: 4 hrs / week
Practical: 2 hrs / week

Examination scheme:
Theory Paper: 100 Marks (3 Hours)
Practical : 25 Marks
Term work : 25 Marks

UNIT I

Nano, size of matter, different kind of small, Nano Challenges, Fundamental science behind Nanotechnology, Electrons, Atoms, Ions, Molecules, Metals, Other material, Biosystems, Molecular Recognition, Electrical conduction and ohm's law, Quantum Mechanics, Quantum ideas Lectures 10, Marks 20

UNIT II

Tools for measuring Nanostructures, Scanning probe Instrument, Nanoscale Lithograpthy, Dip. Pen. Lithography, E beam Lithogaphfy, Nanosphere Lithographty, Polarizmatization, nanobricks and building Blocks. Lectures 10, Marks 20

UNIT III

Smart Materials, Sensors, nanoscale Bio structure, Energy capture, Transformation and storage, Optics, Electronics, Natural nano scale Sensor, Electromagnetic sensors, Electronics Nose. Lectures 10, Marks 20

UNIT IV

Building blocks digital better, Linking brains with computer, End of transistor Road, FET to SET, Fabrication new chips, Semiconductor Quantum Dots, Synthesis of Quantum dots, Electronic Structure of Nanocrystals Lectures 10, Marks 20

UNIT V

Application in Medical, Understanding how pharmaceutical, Companies develop drug, Delivering new drug Technology, Oil and Water won't help, Mincells, special delivery cancer with Nanoshell. Lectures 10, Marks 20

References:

1. Mark Ratnakar, Daniel Ratnakar – Nanotechnology : A gentle Introduction to Next Big Idea, Prentice hall of India
2. Richard Booker, Eart Boy sen - Nanotechnology Fun and easy way, Wiley
3. Charles P. Poole J.V. Frank J. Owens - Introduction to Nanotechnology , Wiley India ISBN
4. T. Pradeep - Nano: The essentials, understanding Nanoscience and Nanotechnology , TMH

Note: Minimum EIGHT practicals are to be performed, based on above syllabus.

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B.E. (ELECTRONICS, ELECTRONICS AND COMMUNICATION, ELECTRONICS AND TELECOMMUNICATION)

W.E.F : 2008- 09

TERM - II
INDUSTRIAL VISIT / CASE STUDY

Teaching scheme:
NIL

Examination scheme:
Term Work : 25 Marks

EDUCATION TOUR / TECHNICAL VISITS / CASE STUDY AND ITS EVALUATION

1. During (B.E. First Term / Second Term) seventh and / or eighth terms or during vacation between (B.E. First Term / Second Term) seventh and eighth terms, every student; shall visit minimum two industries, factories arranged by colleges and accompanied by teachers. There shall be at least one teacher for a group of 20 students and at least one non-teaching staff accompanied with the students.

2. The colleges should obtain appropriate certificates of visit from the concerned organizations just after the visits.

3. Students should submit written report about the visits individually at the end of (B.E. Second Term) eighth term.

4. The report should contain information about the following points:

   (a) The organization - activities of organization and administrative setup technical personnel and their main duties.
   (b) The project / industry brief description with sketches and salient technical information.
   (c) The work / processes observed with specification of materials, products, equipments etc. and role of engineers in that organization.
   (d) Suggestions (if any) for improvement in the working of those organizations.

5. The evaluation of the report of technical visits will be made by panel of two teachers appointed by principal based on following points:

   (a) Coverage aspect: All above points should be covered.
   (b) Detailed observations: System / Process / Product explained with data, diagram specifications.
   (c) Quality of presentation: Report should be very objective and should consist of clear and systematic organization of topics and information.
   (d) Viva - voce: A viva -voce shall be conducted on the technical visit report by the teachers to assess the specific knowledge gained by the students for technical applications.

6. The case study should include the study problem in Electronics or in Electronics and telecommunication Engineering branch.

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B.E. (ELECTRONICS, ELECTRONICS AND COMMUNICATION, ELECTRONICS AND TELECOMMUNICATION)

W.E.F : 2008- 09

TERM - II
PROJECT II

Teaching scheme:
Practicals: 4 hrs / week

Examination scheme:
Oral : 50 Marks
Term Work : 100 Marks

1. The Project group in (B.E. first Term) seventh term will continue the project work in (B.E. Second Term) eighth term and complete project in all respect (assembly, testing, fabrication, tabulation, test result etc.)
2. The group should maintain a logbook of activities. It should have entries related to the work done, problems faced, solution evolved etc., duly signed by guide.
3. The guides should regularly monitor the progress of the project work.
4. The project work along with project report should be submitted as part of term work in (B.E. Second Term) eighth term on or before the last day of the (B.E. Second Term) eighth term
5. Project report must be submitted in the prescribed format only. No variation in the format will be accepted.
6. Assessment of the project for award of TW marks shall be done by the guide and a departmental committee (consisting of minimum two teachers with experience more than three years) as per the guidelines given in the following table.

B) ASSESSMENT OF PROJECT II TERMWORK (B.E. SECOND TERM)

NAME OF THE PROJECT: _____

NAME OF THE GUIDE: _____

Sr. No	Exam. Seat No	Name Of Students	Assessment by guide (70%)						Assessment by department (30%)			Grand Total
			Fabrication /software / actual work	Execution of project	Project report	Scope/ Cost / Utility	Attende-nece	Total	Evaluation (10%)	Prese-ntaion (20%)	Total	
		Marks	20	10	20	10	10	70	10	20	30	100

Sign of Guide Sign. of Committee Members Sign. of H. O. D.

7. The guide should be internal examiner for oral examination (If experience is greater than three years).

8. The external examiner should be from the related area of the concerned project. He should have minimum of five years of experience at degree level / industry.

9. The evaluation at final oral examination should be done jointly by the internal and external examiners.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
STRUCTURE OF TEACHING AND EVALUATION
S.E.(I.T.)
First term

W.E.F. 2006-07

Sr. No.	Subject	Teaching Scheme Hours/week			Examination Scheme				
		Lectures	Tutorial	Practical	Paper Duration Hours	Paper	TW	PR	OR
1	Programming Paradigm and Methodology	4	--	--	3	100	25	--	25
2	*Discrete Structure and Graph Theory	4	--	--	3	100	--	--	--
3	*Digital Systems and Microprocessor	4	--	2	3	100	50	25	--
4	*Industrial Management and Economics	4	--	--	3	100	- -	--	--
5	*Engineering Mathematics –III	4	1	--	3	100	25	--	--
6	*Programming Laboratory I	3	--	4	--	--	50	50	--
	Total	**23**	**1**	**6**	**- -**	**500**	**150**	**75**	**25**
	Grand Total	**30**			**750**				

SECOND TERM

Sr. No.	Subject	Teaching Scheme Hours/week			Examination Scheme				
		Lectures	Tutorial	Practical	Paper Duration Hours	Paper	TW	PR	OR
1	*Microprocessor I	4	--	2	3	100	25	25	--
2	*Data Structure and Files	4	--	4	3	100	50	50	--
3	*Computer Organization	4	--	--	3	100	--	--	--
4	Information Theory	4	--	--	3	100	--	--	--
5	*Data Communication	4	--	--	3	100	--	--	--
6	*Programming Laboratory II	2	--	4	--	--	50	50	--
	Total	**22**	**0**	**10**	**--**	**500**	**125**	**125**	**--**
	Grand Total	**32**			**750**				

* Common Subject with SE (Computer)

NORTH MAHARASHTRA UNIVERSITY, JALGAON

SE (INFORMATION TECHNOLOGY)
(w.e.f. 2006-07)

TERM – I

PROGRAMMING PARADIGMS AND METHODOLOGY

Teaching Scheme:
Lectures: 4 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)
Term work: 25 Marks
Oral: 25 Marks

Unit – I

Introduction: Different types of programming languages .i.e. Machine level, Assembly ,high level, 4GL, characteristics of HLL, programming languages ,role seed ,Genealogy of programming languages ,software Engineering and programming languages , characteristics of good programming languages , programming languages paradigms.
Languages description –character set, tokens (lexical issue), sentence –syntax and semantics, grammar, types and representation.

(10 Hrs, 20 Marks)

Unit – II

Implementation of Basics Blocks of a languages: Data types, classification, structure and Nonstructural data types, variables and constants, Derived and abstract data types, Data types-character, integer, float double, array, set, enum, Boolean, void, pointer, structure, class, union, sub range etc. with respect to programmer view, implementation, storage representation, values associated and boundary(range). operation on data types–arithmetic, conditional, logical, programming languages and control statements–expression, assignments, control flow statements, iterative statements, introduction to function call and definition, macro.

(10 Hrs, 20 Marks)

Unit – III

Procedures: Need of procedure referencing environment's-local, no local, global for block structure and non block structure language, procedure v/s block scope virility and life time OS variable static and dynamic scope. Activation record, study of procedure call in C and Pascal, Different parameter passing method, storage management – static and dynamic.

(10 Hrs, 20 Marks)

Unit – IV

Object Oriented programming – limitations of procedural programming, characteristics and application of object oriented programming, Genealogy of OOP, basic concepts in oop such as information hiding, abstraction

(10 Hrs, 20 Marks)

Unit – V

Functional programming –procedural programming V/s functional programming, mathematic function v/s functional programming, elements of functional programming, Genealogy of functional programming, various operation functional programming, function call, recursive function, data v/s function in context of functional programming, scooping issue.

(10 Hrs, 20 Marks)

Reference Books –

1. Ravi Sethi, “Programming Languages, Concept and Principles ”, Addison Wesley
2. Horowitz Sahani, “Principles of Programming Languages”
3. Sebesta,”Principles of Programming Languages”.
4. Balguruswamy,”Object Oriented Programming in C/C++.
5. R.D.Tennet,”Principles of Programming languages”.
6. T.W.Pratt,M.V.Zelkowtz,”Programming languages:Design and implementation”,Pearson
7. C.Ghezzi,M.Jazayeri,Programming Language concepts,Wiley

NORTH MAHARASHTRA UNIVERSITY, JALGAON

SE (COMPUTER ENGINEERING / INFORMATION TECHNOLOGY)
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TERM – I

DISCRETE STRUCTURE AND GRAPH THEORY

Teaching Scheme:
Lectures: 4 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)

Unit - I

Sets, Logic and Proofs
Propositions, proposition and logical operations, Conditional Statements, Propositional Calculus, Quantifiers: universal and existential quantifiers, methods of proofs, Set Theory: Set, Combinations of Sets, Finite and Infinite sets, uncountably infinite sets, Mathematical Induction, Principle of inclusion and Exclusion.
Discrete Probability, Information and Mutual information (10 Hrs, 20 Marks)

Unit - II

Relations, functions, Recurrence Relations
Definitions, properties of Binary relations, Equivalence Relations and partitions, Partial ordering relations and lattice, chains and antichains, Transitive Closure and Warshall’s Algorithm.
Functions Definitions, Pigeonhole principle.
Recurrence Relation, Linear Recurrence Relations with constant Coefficients, Homogeneous Solutions, Particular Solutions, total solutions, Solution by the method of generating functions.
(10 Hrs, 20 Marks)

Unit - III

Graphs
Basic terminology, multigraphs and weighted graph , paths and circuits , shortest path algorithms, Euler and Hamiltonian Paths and circuits , factors of a graph, Planer graph and Kuratowski theorem, graph coloring.
Trees
Trees, rooted trees, path length in rooted trees, prefix code, binary search trees, spanning trees and cut set, minimum spanning trees, kruskal’s and prim’s algorithms for minimum spanning tree.
(10 Hrs, 20 Marks)

Unit - IV

Analysis of Algorithm and Algebraic systems - Time Complexity of algorithms, shortest path algorithms, complexity of problems, tractable and intractable problem.
Algebraic system - Groups, subgroups, Isomorphisms and Automorphisms, Homomorphisms and Normal subgroup, Rings, Integral domains and fields. (10 Hrs, 20 Marks)

Unit - V

Boolean algebra - Lattice and Algebraic systems, Principle of duality, basic properties of lattice defined by lattices, distributive and complemented lattices, Boolean lattices and Boolean algebras, Boolean functions and Boolean Expressions.
Binary Number systems- binary, octal, hex conversion. Application of Boolean algebra.
(10 Hrs, 20 Marks)

Reference Books

1. C.L. Liu , " Elements of Discrete Mathematics", 2nd edition, Tata McGraw-Hill, 2002
2. Kenneth H. Rosen, Discrete Mathematices and its Application, 5th edition, TMH
3. Lipschutz, lipson, " Discrete Mathematics", 2nd edition, Tata McGraw- Hill, 1999.
4. V. K. Balakrishnan, " Graph Theory", Tata McGraw- Hill
5. B. Kolman , R. Busby and S. Ross, "Discrete Mathematical Structures" 4th edition, Pearson education,2002
6. J. Treamblay , R. Manohar ," Discrete Mathematical structures with application to computer science" , Tata McGraw-Hill

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NORTH MAHARASHTRA UNIVERSITY, JALGAON

SE (COMPUTER ENGINEERING / INFORMATION TECHNOLOGY)
(w.e.f. 2006-07)

TERM – I

DIGITAL SYSTEMS AND MICROPROCESSOR

Teaching Scheme:
Lectures: 4 Hrs / Week
Practical: 2 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)
Term work: 50 Marks
Practical: 25 Marks

Unit – I

Review of fundamental concepts: Basic gates, universal gates & Exclusive gates. Digital Signal, Positive & Negative logic,
Boolean Algebra: Boolean postulate and Theorems, Examples of realization of Boolean functions using Boolean algebra.
Introduction to digital logic families: DTL, TTL & CMOS (10 Hrs, 20 Marks)

Unit – II

Combination logic design: Standard representation of logical function, K map representation of logical function, simplification of logical function using K map, for 2, 3 & 4 variables. K map with Don't care condition. Introduction to five and six variable K map with don't care condition. Design of half adder, full adder, half sub tractor, full sub tractor (10 Hrs, 20 Marks)

Unit – III

Combination logic design examples: Various Example of combinations logic circuit (truth table – K map – circuit diagram) with the help of K map and their implementation with the help of Basic/Universal gates.
Design of multiplexer & Demultiplexer: Design of comparator circuits using logic gates. Design of parity generator & checker circuit using logic gates
Introduction to sequential logic circuit: function of one bit memory cell, Truth table and excitation tables of S – R, JK, D & T Flip – Flop. (10 Hrs, 20 Marks)

Unit – IV

8085 Microprocessor
Introduction to 8085 Microprocessor - Architecture, functional pin diagram, register model , programming model , Bus architecture
Instruction Set of 8085 - Instruction cycle, fetch operation, execute operation machine timing diagram for op code fetch cycle, memory read, I/O read, memory write, I/O write, various addressing modes, various instruction set such as data transfer group, arithmetic group, logical group, branch group, stack, input, output and machine control group, instruction format, various addressing modes (10 Hrs, 20 Marks)

Unit – V

8085 assembly programming - Assembly Language, comparison of high level language and assembly language, role of assembler, Assembly language programming of 8085: addition and subtraction of 8 and 16 bit numbers, one's and two's complements of 8 and 16 bit numbers, multiplication and division of 8 and 16 bit numbers, largest and smallest number using array, sorting of numbers using array, finding square from look up table, square root of number, program related to shift and masking operation of 8 and 16 bit numbers.
(10 Hrs, 20 Marks)

List of Experiments

Group A

1. Verity the truth table of logic gates and verification of DeMorgance theorem.
2. Construction on of basic gates using universal gate (NAND / NOR)
3. Construction of half adder & full adder circuit. Also implement full adder with the help of two half adder circuit & one OR gate.
4. Construction of Half subtractor & full subtractor Circuit.
5. Gray to Binary and Binary to gray code converter.
6. Verification of truth table of multiplexes & flip flops.

Group B (8085 Assembly Language Programming)

1. Addition and subtraction of 8 and 16 bit numbers
2. Determining maximum and minimum elements in array
3. Look up table for BCD to 7 Segment conversions
4. HEX To BCD and BCD to HEX conversion
5. Arranging the numbers in ascending and descending order
6. Shift and mask off operation of 8 bit number

The term work should include minimum four experiments from Group A and minimum four experiments from Group B.

Reference Books

1. Modern Digital Electronics by R.P. Jain, 3rd Edition, TMH.

2. Digital Logic and Computer Design by M. Morris Mano, Pearson.
3. Fundamentals of Digital Circuits by A Anandkumar, Pearson.
4. Microprocessor and Interfacing , 2nd edition ,Douglas V Hall
5. Advanced Microprocessors and Interfacing , B Ram, TMH
6. Microprocessor architecture, programming and applications , 2nd ed , Ramesh Gaonkar
7. Introduction to Switching Theory and Logic Design, Hill and Peterson , John Wiley and Sons.
8. Digital system, James E Palmer, David E Parlman, McGraw Hill.

NORTH MAHARASHTRA UNIVERSITY, JALGAON

SE (COMPUTER ENGINEERING / INFORMATION TECHNOLOGY)
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TERM – I

INDUSTRIAL MANAGEMENT AND ECONOMICS

Teaching Scheme:
Lectures: 4 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)

Unit - I

History of Management, Scientific Management, & its Principles, Administration Management, Neo – Classical Theory, Gilberth's contribution, Modern management Theories, Relation between Administration and organization, Levels of managements, Function of Management.

(10 Hrs, 20 Marks)

Unit – II

Organizational structures: Line, functional, Line staff forms of Business ownerships: Proprietorship, partnership Joint stock Co - Pvt. Ltd. Co., public Ltd Co., Co-operative organizations, public sector, joint ventures, Their meanings, formation, Advantage, Limitations & Applications.

(10 Hrs, 20 Marks)

Unit – III

Engineering Economics. Wants, Utility, Demand, Supply, Elasticity of demand & supply. Capital: Fixed, Working capital, sources of finance Credit, shares, Debentures, ploughing Back, Loans from banks, Trade Public Deposits, financial Institution, foreign capital. Cost Estimating, Cost Accounting, Fixed costs, veriable costs selling price. (No Numericals)

(10 Hrs, 20 Marks)

Unit – IV

Manpower planning, factors affecting manpower planning sources of Recruitment, Need, objectives & benefits of Training, Method of Training workers, supervisors and Executives. Job Evaluation & Merit rating (Concept Only) Selling & Marketing Concept, Sales promotion, Advertising.

(10 Hrs, 20 Marks)

Unit – V

Quality (International Standard Organization of standards) ISO certificate Intellectual property rights (IPR), patents, Trademarks, copyrights, Management information system (MIS), Definition, Need & objectives of MIS, MIS & Computer, Designing of MIS, Application of MIS.

(10 Hrs, 20 Marks)

Reference Books –

1. Industrial Engineering & Production Management by M. Mahajan.
2. Engineering Management by Mazda, Pearson
3. Industrial Organization and Management by O.P. Khanna, Dhanpat Rai & Sons
4. Management Information system by Jawdekar, THM
5. Information systems: Foundation of eBusiness by Alter, Pearson
6. Management by Stoner, Pearson

NORTH MAHARASHTRA UNIVERSITY, JALGAON

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TERM – I

ENGINEERING MATHEMATICS - III

Teaching Scheme:
Lectures: 4 Hrs / Week
Tutorial: 1 Hr / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)
Term work: 25 Marks

Unit – I

Linear Differential Equation – Linear differential equation of order n, solution of LDE with constant coefficient, method of variation of parameters, equation reducible to linear form with constant coefficients, Cauchy's linear equation, Legendre's linear equation, Solution of simultaneous and symmetric simultaneous differential equation, applications to electric circuits.

(10 Hrs, 20 Marks)

Unit – II

Fourier and Z-transforms –
Fourier Transform (FT) – Fourier integral theorem, sine and cosine integrals, Fourier transform, Fourier cosine transform, Fourier sine transform and their inverses, Problems on wave equation.
Z-Transform – definitions, standard properties (without proofs), ZT of standard sequences and inverse, Solution of simple differential equations, Applications of Z-transform to discrete system analysis.

(10 Hrs, 20 Marks)

Unit – III

Laplace Transform (LT) – definition of LT, inverse LT, properties and theorems, LT of standard functions, LT of some special functions, (1^{st} order Bessel's periodic, unit step, unit impulses and ramp), Problems on finding LT and inverse LT, initial and final value theorems, applications of LT for network analysis.

(10 Hrs, 20 Marks)

Unit – IV

Statistics – mean, mode, median, standard deviation, variance, co-efficient of variation, Moments, skewness and kurtosis, Bivariate distribution, correlation and regression, rediability of regression estimates

Probability – Theorems on probability, Binomial distribution, Poisson distribution, Normal distribution

(10 Hrs, 20 Marks)

Unit – V

Probability – Beta distribution, Gamma distribution, Chi-square distribution

Theory of sampling – Sampling, types of sampling, sampling distribution, testing Hypothesis, Null hypothesis, level of significance, Test of significance, test of significance of large sample, decision quality control.

(10 Hrs, 20 Marks)

Text Books –

1. Advanced Engineering Mathematics – Erwin Kreyszig (Wiley Eastern Ltd)
2. Advanced Engineering Mathematics – H K Dass (S Chand)

Reference Books –

1. Advanced Engineering Mathematics – Wylie C R and Barrett, McGraw Hill
2. Higher Engineering Mathematics – B S Grewal, Kanna Publication
3. Engineering Mathematics – B V Raman, Tata McGraw Hill
4. Applied Mathematics Vol 1 and 2 – P N Wartikar and J N Wartikar (Pune Vidharthi Griha Prakashan Pune)
5. Advanced Engineering Mathematics with MatLab, 2nd Edition – Thomas L Harman, James Dabney and Norman Richert , Thomson Learning
6. Engineering Mathematics – III – Dr. Gokhale, Dr. Chaudhary and Dr. Singh

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NORTH MAHARASHTRA UNIVERSITY, JALGAON

SE (COMPUTER ENGINEERING / INFORMATION TECHNOLOGY)
(w.e.f. 2006-07)

TERM – I

PROGRAMMING LABORATORY - I

Teaching Scheme:
Lectures: 3 Hrs / Week
Practical: 4 Hrs / Week

Examination Scheme:
Term work: 50 Marks
Practical: 50 Marks

Unit –I

Introduction to C - C Fundamentals, data types , constants , variables, Statements, operators, expressional, control statements.
Arrays - Representation and declaration of array one dimensional array, two dimensional array, multidimensional array.
Strings - Representation, array of string, operation on sitting.
Pointers - Fundaments, declaration, advantage, pointers to different data types , array and pointers, array to pointers, operations on pointers
Functions - Need function definition, prototype, function, parameter, recursion, scope of Variables in the function, library functions, passing array to function, pointer to function

Unit – II

Structure - Definition, declaration, array to structures, structures within structures, structures, and function, structures and pointers, self referential structures user defined data types – typedef .
Union - Need definition, operation, bit fields, difference between structure and union.
File Handling - Structure of file, file types, file operations
Macros - Substitution, File inclusion, complier, controlled directives.

Unit – III

Inter-conversion – Inter-conversion of Number system: decimal, binary, octal, hexadecimal.
System of liner equation - Gauss Elimination, Gauss Jordan, Jacobi or Gauss Siedel.
System of differential Equation - Taylor, Heun's method, Euler's modified method.

Unit – IV

Root of equations, Methods - Newton-Raphson, Raquel, faisi, Bolzano.
Interpolation - Newton backward, forward difference, table, divided difference.
Integration - Trapezoidal, Simpson's 1/3, 3/8 rule.

Unit – V

Permutation, Combination, powerset, Sorting - Insertion, Quick, Merge, Bubble, study of algorithms and implementation, analysis of sorting methods.
Searching - Linear search, binary search.

List of Experiments -

1. Matrix Operation (Addition, Multiplication, Inverse)
2. Swapping of numbers using single pointer.
3. Processing student records using structure.
4. File manipulation opening closing, input and output operation files.
5. Program for macros.
6. Nesting of macro.
7. Macro with arguments
8. Inter conversion of number system.
9. To find value of unknown using Guass Elimination.
10. To find value of unknown using Guass Siedal.
11. To find root of equation using Newton Raphson.
12. To find root of equation using Regula-Falsi.
13. Find interpolating values using interpolation methods.
14. Find integral values using Simpson's 1/3, 3/8 rules.
15. Generation of Permutation for given list.
16. Generation of Combination for given list.
17. Generation of Power set.
18. String Operations.
19. Sorting using Bubble Sort.
20. Sorting using Quick Sort
21. Searching of given element using linear search.
22. Searching of given element using Binary search.

The term work should include minimum 15 experiments from the above list.
The programs should be developed with integrated development environment (IDE) like Turbo C with emphasis on step by step development and debugging.

Reference Books -

1. M.K.Jain lyanger "Numerical Method of Scientific and Engineering Computer" 3rd edition, New age publications.

2. E. Balaguruswami " programming in ANSI C" Tata McGraw Hill.
3. H. Schildt, " C The complete Reference" Tata McGraw Hill
4. Venugopal, K.R. and Prasad Sudeep R, "Programming With C" Tata McGraw Hill.
5. V. Rajaraman " Computer Oriented Numerical Methods" 3rd Edition Prentice Hall of India, Eastern Economy Edition.
6. Steven Chapra "Numerical Methods for Engineers" Tata McGraw Hill.
7. Ellis Horowitz and Sahani " Fundamentals of Data Structure" Tata McGraw Hill.
8. Kanetkar Y P, "Let us C" BPB Publications.

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TERM – II

MICROPROCESSOR - I

Teaching Scheme:
Lectures: 4 Hrs / Week
Practical: 2 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)
Term work: 25 Marks
Practical: 25 Marks

Unit – I

8086/ 8088 CPU architecture programming model Segmentation, Addressing modes, Instruction sets, Assembly language programming BIOS and DOS interrupts. (10 Hrs, 20 Marks)

Unit - II

BIOS AND DOS Interrupts:, Introduction to DOS, Assembly language Programming in MSDOS using BIOS and DOS Interrupts, programming Technique, Time delay loop, produce and macros. (10 Hrs, 20 Marks)

Unit – III

8086 Configuration:, Basic 8086 configuration, maximum and minimum modes, System bus timing, Interrupt priority management, programmable interrupt controller (PIC) 8259A 8089 (IOP) (10 Hrs, 20 Marks)

Unit – IV

Main memory design: 8086 CPU Read/ Write timing SRAM and ROM interfacing requirement, address decoding technique full partial block PROM, Troubleshooting the memory module. DMA: Basic DMA operation, 8237 DMA Controller (10 Hrs, 20 Marks)

Unit – V

Multiprocessor Configuration: Queue status and block facility 8086 based multiprocessor system, co-processor configuration, closely coupled configuration Overview of loosely coupled configuration, 8087 NDP, 8087 Data types and processor architecture, 8087 programming. (10 Hrs, 20 Marks)

List of Experiments -

Assembly language programming of 8086:

1. Study of BIOS and DOS interrupts
2. Study of MASM directives
3. Program for string manipulation
4. Program for password
5. HEX- BCD conversion
6. BCD- HEX conversion
7. BCD Addition
8. Program using MACRO
9. Program using NEAR procedure
10. Program using FAR procedure
11. Program to display Date and Time
12. Program using structures
13. Program using 8087 instruction set
14. Program using 8087 instruction set

The term work should include minimum 12 experiments. Program based on 8087 are compulsory.

Reference Book:

1. John E. Uffenteck , “The 8086/ 8088 Family: Design, Programming and Interfacing, “ Pearson.
2. S.P. Dandomudi,“ Introduction to Assembly Language Programming – From 8086 to Pentium Processor” Springer.
3. Yu – Cheng Liu and Gleen A Gibson, “Microcomputer systems; The 8086 / 8088 Family Architecture, Programming and Design” 2nd Edition, Pearson.
4. Allen Wyatt, “Assembly Language Programming” QUE.
5. Peter Abel, “IBM PC Assembly Language and Programming” Pearson.
6. Douglas V. Hall “Microprocessor and Interfacing” Programming and Hardware” Pearson.
7. Barre B Brey “The Intel Microprocessor: 8085/ 8088, 80186/ 80286, 80386, 80186, Pentium, and Pentium Pro Processor- Architecture Programming and Interfacing” 4th Edition, Pearson.
8. A.K.Rai and K.M.Bhurchandi, “Advance Microprocessors and Principles- Architecture Programming and Interfacing” Tata McGraw Hill.
9. B.Ram “Advanced Microprocessors and Interfacing”, Tata McGraw Hill.

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TERM – II

DATA STRUCTURES AND FILES

Teaching Scheme:
Lectures: 4 Hrs / Week
Practical: 4 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)
Term work: 50 Marks
Practical: 50 Marks

Unit – I

Introduction: Concept of data, data types, data objects, structure, abstract data type, (ADT) and study .Implementation of data structure.
Stack and Queues:- Fundamental of stacks and queues, Data Structure of stack and queues, Basic operations on stacks and queues, Disadvantages and applications of stacks and queues, Concept of circular queues, basic operation on stacks and queues, Multi-stack and queues, priority queues.
Applications of Stacks:- Polish notation (infix, postfix, prefix) Evaluation of prefix and postfix expression , inter conversion of infix, prefix and postfix expression. Use of stack by function call and recursive function call, Multi-stack machines, Parenthesis matching, Towers of Hanoi, Queue application. (10 Hrs, 20 Marks)

Unit – II

Linked list: Concept of Linked list, Basic Operations on a single linked list (Creation, insertion, deletion, traversing, concatenating, inverting and length finding) Linked stack and Queues, circular linked list, advantages of circular linked list, erasing circular linked list, Double linked list with basic operations like copy, storing polynomial using linked list, polynomial addition, and Generalized list, operations like copy, and equal depth on generalized list, Data representation for strings, pattern matching in string.
Storage Pool :- Initializing Storage Pool, allocating and (GETNODE) and deal locating (RET) a node Dynamic storage Management Procedure for allocation and freeing of blocks, First Fit, Best fit and Worst fit memory allocation Strategies. (10 Hrs, 20 Marks)

Unit – III

Binary Tree: Basic terminology, Data structure and representation of binary tree, Binary tree traversal, and recursive and non recursive procedure for tree traversal, basic operations on binary tree, (Creation, insertion, deletion, printing, copy, equal and depth finding) Threaded binary tree, insertion in order threaded binary tree, In order traversal of in order threaded binary tree, Concept of binary search tree, Static tree labels, Huffman, Algorithms, Constructions, of optimal binary search tree, Dynamic tree tables, Basic Operation on it-insertion, deletion, height balanced binary tree, LL, LR, RL, RR Rotations (10 Hrs, 20 Marks)

Unit – IV

Sorting - Algorithm for bubble sort, Insertion sort, Quick sort, selection sort, shell sort, merge sort, Heap sort, Radix sort, Radix exchange sort, Best average and worst case time complexity of each of the sorting and searching Algorithm
Hashing: Hashing function, overflow handling, collision, linear probing deletion, clustering re-hashing bucket and chaining selection of good hash function (10 Hrs, 20 Marks)

Unit – V

File Handing - Sequential and Relative Files: Description and organization, primitive operations on sequential and relative file.
Direct access file - Description and organization, primitive operations on direct access files
Indexed Sequential files and Indexes:-Description and organization, primitive operations on indexed sequential files, Indexed concept, linear indexes, tree indexes, algorithm for B-tree.
Multi Indexed files:- Description and organization of Inverted files, Multi list files, and algorithms for addition and deletion of records from the files. (10 Hrs, 20 Marks)

List of Experiments -

List of programming assignments to be developed in C/C++ with emphasis on developing debugging abilities

1. Implementation of stack using array or linked list
2. Implementation of Queue using array or linked list
3. Implementation of circular Queue using array or linked list
4. Conversion of Infix expression to postfix expression
5. Conversion of postfix expression to infix expression
6. Addition of two single variable polynomial using linked list
7. Implementation of double linked list and perform insertion, deletion and searching
8. Creation of binary tree and perform all non-recursive traversals.
9. Creation of binary search tree and perform insertion, deletion printing and in a tree shape.
10. Implementation of pattern matching in starting using linked listed.
11. Create a hash table and handle the collisions using liner probing with or without replacement.
12. Implementation of simple index file.
13. Insertion and deletion of a record from a direct access file using changing with and without replacement.
14. Insertion and deletion of a record from a sequential file.
15. Insertion and deletion of a record from a relative file
16. Insertion and deletion of a record from a multi list file

Term work should be minimum 12 experiments from the above list.
The programs should be developed with integrated development environment (IDE) like Turbo C with emphasis on step by step development and debugging.

Reference Books -

1. Ellis Horowitz and Sahani, “Fundamentals of data Structure” Galgotia.
2. Thomas R. Harborn, “ File system and Algorithms”, Prentice- Hall International
3. Trembaly and Sorenson “An Introduction to Data structures with Applications” Tata McGraw Hill.
4. Tannenbaum, “Data Structure C and C++, Pearson.
5. Sahani, “Data Structures, Algorithms and Applications in C++ McGraw Hill.
6. Seymour Lipschutz, “Data Structures”, Schaum’s Outline.
7. Weiss, “Data structure and Algorithm analysis in C”, Pearson

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TERM – II

COMPUTER ORGANIZATION

Teaching Scheme:
Lectures: 4 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)

Unit – I

Introduction to system concepts: Functional Units, Basic operational concepts, instruction formats for machines, fixed and expanding opcodes, zero, two and three address schemes, concept of stack processor. General Addressing Modes.
Processor Organization: Instruction set design. 68000 architecture – Register structure and addressing modes, normal and exceptional processing. Bus structures. (10 Hrs, 20 Marks)

Unit – II

Information representation, Big-endian and little-endian, data types, fixed and floating point representation, IEEE format for floating point and decimal algorithm, Booths algorithm, bit pairing methods, Restoring and non-restoring division algorithm. Floating point operations, guard bits and rounding (10 Hrs, 20 Marks)

Unit – III

Control unit design, design levels, one / two / three bus CPU, hardwired control design methods and implementations, Microprogrammed control unit concepts and control unit design considerations, Wilkes design, Nano programmed computers, bit-slice architecture, 2900 family CPU designs, emulation. (10 Hrs, 20 Marks)

Unit – IV

Memory Organization: Memory hierarchies, memory interleaving, cache memories organization, virtual memory and organization, performance considerations, content addressable memories, memory management in 68000 family and cache designs, Introduction to SRAM, DRAM, RDRAM, Flash memory. (10 Hrs, 20 Marks)

Unit – V

System Organization: Buses, interconnection system bus, CPU and IO bus-bus operation, UNIBUS, multibus and IEEE 488 I/O addressing, data transfer, synchronization, serial and parallel ports, I/O interfaces, I/O channel, PCI bus, SCSI bus, Universal Serial Bus. RISC architecture, concepts, CISC versus RISC, advantages of RISC (10 Hrs, 20 Marks)

Reference Books –

1. Hamacher, Vransic, Zaky, “Computer Organization”, 5th Ed., McGraw Hill international.
2. J. P. Hayes, “Computer Architecture and Organization”, 3rd Ed. McGraw Hill international.
3. Tanenbaum, “Structured Computer Organization”, Pearson.
4. William Stallings, “Computer Organization And Architecture”, 6th ed., Pearson.
5. Nicholas Carter, “Computer Architecture”, Schaum’s Outline.

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TERM – II

INFORMATION THEORY

Teaching Scheme:
Lectures: 4 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)

Unit – I

Foundation - Terminology, stegnography, substitution cipher & transposition cipher, simple X-OR, one-time pads.
Cryptographic protocol-Introduction to protocol, communication using symmetric cryptography, one-way hash function, communication using public key cryptography.

(10 Hrs, 20 Marks)

Unit - II

Cryptographic Techniques - Key management – Generating, Transferring & Verifying keys, Lifetime of keys, Destroying keys.
Algorithmic types & modes- Electronic codebook, Cipher block chaining mode, Stream cipher, Public key algorithm-RSA.

(10 Hrs, 20 Marks)

Unit - III

Cryptographic algorithm - Information theory-entropy & uncertainty, rate of language, unicity distance, confusion & diffusion, Complexity theory, Number theory-modular arithmetic, Chinese remainder theorem, Factoring, Prime number generation, Data Encryption Standards (DES)-description of DES.

(10 Hrs, 20 Marks)

Unit – IV

Compression Algorithm – Entropy, Huffman algorithm, Adaptive Huffman coding – Adaptive coding, Updating Huffman tree, Statistical modeling, Dictionary based model Compression.

(10 Hrs, 20 Marks)

Unit - V

Sliding window compression – algorithm, LZSS Compression, Speech compression – Digital Audio concept, Lossless compression of sound, Lossy graphics compression – Lossy compression, JPEG Standards, implementing DCT.

(10 Hrs, 20 Marks)

Reference Book:

1. Bruce Schneider, “Applied cryptography”, Protocols, Algorithms and sources code in C, John Wiely and Sons.
2. Mark Nelson, “The Data compression Book”, 2nd Edition M & T book.
3. Darrel Hankerson , Grey A Harrige , Peter D. Johnson Jr, Introduction to Information Theory & Data compression CRC .
4. Alfred Menezes , Paul Van Oorschot, Vanstone , Handbook of applied cryptography , CRC

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TERM – II

DATA COMMUNICATION

Teaching Scheme:
Lectures: 4 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)

Unit – I

Introduction to data communication and networks –
Data communication – Components, data representation, direction of flow
Networks – network criteria, network hardware, network software, protocol hierarchy, design issues for the layer, ISO OSI reference model
Signals – Analog signals, digital signal, analog verses digital signal, data rate limits, transmission impairment, throughput, propagation speed, propagation time, wavelength etc.

(10 Hrs, 20 Marks)

Unit – II

Digital transmission and analog transmission –
Digital transmission – line coding, characteristics, schemes. Block coding, transformation and common block codes. Sampling – PAM, PCM, Nyquist's theorem, bit rate, transmission modes.
Analog transmission – Analog modulation, AM, FM, PM. Digital modulation, ASK, FSK, PSK, QAM. Bit/baud comparison.
Telephone modems – Modem standards, traditional modems, 56K modems etc.

(10 Hrs, 20 Marks)

Unit – III

Multiplexing – FDM – Multiplexing process, de-multiplexing process, applications of FDM, WDM, TDM – Time slots, frames, interleaving, synchronization, bit padding, DSS, T-Lines, inverse TDM, Applications of TDM.
Transmission media – Guided media, twisted pair, coaxial cable, fiber optics, unguided media, radio waves, microwaves, infrared.
Switching – Circuit switching, packet switching and message switching. Telephone networks – components, LATAs, making conections, analog services and digital services.

(10 Hrs, 20 Marks)

Unit – IV

Error detection and correction –
Types of errors, single bit burst errors. Detections – redundancy, parity, CRC, checksum. Error correction – Correction by retransmission, FEC, Burst error correction.
Flow control and error control – stop and wait ARQ, Go-back-N ARQ, selective repeat ARQ.

(10 Hrs, 20 Marks)

Unit – V

Ethernet – Traditional Ethernet, fast Ethernet, gigabit Ethernet.

Multiple access – random access, MA, CSMA, CSMA/CD, CSMA/CA, control access, FDMA, TDMA, and CDMA.
IEEE 802.3, 802.4, 802.5, X.21, X.25, SDLC/HDLC protocol standards.
Introduction to network connecting devices – repeater, bridge, router, gateway, hub etc.

(10 Hrs, 20 Marks)

Reference Books –

1. "Computer Networks" A S Tanenbaum 4th edition, Pearson
2. "Data Communication and Networking" B Forouzan, 3nd edition, TMH
3. "Data Communication and Networking" Achyut Godbole, TMH

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TERM – II

PROGRAMMING LABORATORY - II

Teaching Scheme:
Lectures: 2 Hrs / Week
Practical: 4 Hrs / Week

Examination Scheme:
Term work: 50 Marks
Practical: 50 Marks

Unit – I

Introduction to Object Oriented Programming - Need of Object Oriented Programming: A look at Procedure Oriented Programming, Object Oriented Programming Paradigm Basic Concept of OOP - Objects, classes, Data Abstraction, Encapsulation, Inheritance, Polymorphism, Data hiding ,Message Passing. Benefits of OOP, Application of OOP

Beginning with C++ : What is C++, Structure of C++ Program, A simple C++ program, comments, output using Cout, input using Cin, declaration of variables, Reference variables, Token, Keywords, Identifier, Constant, Basic data types, Derived data types.

Unit – II

Control structures , Classes and Objects - Control Structures: If statement, switch statement, Do while statement, while statement and For statement.
Classes and objects: Specifying a Class, Defining Member function, A C++ program with class, Nesting of member function, Private member function, Array within a class, memory allocation for objects, Static Data member, Static member function, Array of Objects, Objects as function argument, Friendly function, Returning objects.
Constructor and destructor - Constructor Parameterized Constructor ,Multiple Constructor in a class, Constructor with default argument, Dynamic Initialization of Objects,
Copy Constructor, Destructor

Unit – III

Functions and Operator overloading - Function in C++: The main function, Function prototype, Call by value, Call by reference, Return by reference, Inline Function, Default Argument, Function Overloading,
Operator - Operator in C++, Scope Resolution Operator, Operator Precedence
Operator Overloading - Defining Operator overloading, Overloading Unary Operator, Overloading Binary operator, Overloading binary operator using friend, Rules for operator overloading
Type conversion

Unit – IV

Inheritance and Pointer, Virtual function and Polymorphism, Inheritance: Introduction, Defining Derived classes, Single inheritance, Making a Private member inheritable, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid inheritance, Virtual base classes, Abstract classes, Constructor in derived class.
Pointer, Virtual Function and Polymorphism: Introduction, Pointer to Object, this pointer, Pointer to Derived classes, Virtual function.

Unit – V

Managing Console I/O operation and File Operation - Managing Console I/O operation: C++ Stream, C++ Stream Classes, Unformatted I/O Operation, Formatted Console I/O operation, Managing Output with manipulators
Working with files: Classes for File Stream Operations, Opening and Closing a File, Detecting End Of File ,More about Open() : File Modes, File Pointer and their manipulator, Sequential Input and Output Operations, Updating a File: Random Access. Error handling during file operation, Template: Function template, Class Template

List of Experiments -

1. One Simple C++ Program
2. C++ Simple Program using Control Structure.
3. Program to create array of Object.
4. Program that illustrate use of various types of constructor
5. Program for String Manipulation
6. Program for Unary Operator Overloading.
7. Program for Binary Operator Overloading
8. Program for Function Overloading
9. Program for Multilevel inheritance
10. Program for Run time polymorphism using Virtual Function
11. Program to format output using manipulator
12. Program for File Handling
13. Program using Template
14. Mini project in C++ (e.g. Banking system, Railway reservation system etc.)
15. Program for stack operations using class
16. Program for Queue operations using class

Term work should include minimum 12 experiments from the above list.
The programs should be developed with integrated development environment (IDE) like Borland C++ with emphasis on step by step development and debugging.

Reference Books –

1. E. Balgurusamy ," Object Oriented Programming with C++ ", III Edition TATA McGraw –Hill Publication
2. Kanetkar Y. , " Let Us C++" , BPB Publication
3. Schildt , " C++ The Complete Reference " ,Tata McGraw Hill Publication.

North Maharashtra University, Jalgaon
New Syllabus with effect from Year 2006-07
TE IT Term I

Sr. No	Subject	Teaching Scheme per Week			Examination Scheme				
		L	T	P	Paper Hr.	Paper	TW	PR	OR
1	Multimedia Techniques	4	-	2	3	100	25	25	-
2	Theory of Computer Science *	4	-	-	3	100	-	-	-
3	Computer Network *	4	-	2	3	100	25	-	25
4	Computer Graphics *	4	-	2	3	100	25	-	-
5	Systems Programming *	4	-	2	3	100	50	-	25
6	Advanced Development Tools Laboratory *	-	-	4	-	-	50	-	-
	Total	20	0	12		500	175	25	50
	Grand Total	**32**			**750**				

TE IT Term II

Sr. No	Subject	Teaching Scheme per Week			Examination Scheme				
		L	T	P	Paper Hr.	Paper	TW	PR	OR
1	Management Information Systems	4	-	-	3	100	-	-	-
2	Operating Systems *	4	-	2	3	100	25	-	-
3	Software Engineering *	4	-	2	3	100	25	-	50
4	Database Management System *	4	-	2	3	100	25	25	-
5	Web Design	4	-	4	3	100	25	-	50
6	Practical Training/Mini Project/Special Study		-		-	-	25	-	-
	Total	20	0	10		500	125	25	100
	Grand Total	**30**			**750**				

* Common subject with TE Computer

NORTH MAHARASHTRA UNIVERSITY, JALGAON

TE (INFORMATION TECHNOLOGY)
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TERM – I

Multimedia Techniques

Teaching Scheme:
Lectures: 4 Hrs / Week
Practical: 2 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)
Term Work: 25
Practical: 25

Unit – I
What is Multimedia? Medium, Types of media, Properties of multimedia system, Data stream characteristics Multimedia applications, Multimedia system architecture, Objects for multimedia system: text, images, audio, video. Basic sound concepts, Computer representation of sound, Music: MIDI, MIDI Devices, MIDI Messages, MIDI Software.

(10 Hrs, 20 Marks)

Unit – II
Image and Graphics : Digital Image representation, Computer image processing, Dithering, Image recognition steps.
Rich Text Format (RTF), Introduction to TIFF and RIFF.
Video: Video Signal Representation, Properties of Visual representation,
Animation: Computer based animation, Basic concepts, Methods of controlling animation.

(10 Hrs, 20 Marks)

Unit – III
Data Compression: Need of compression, Coding requirements, Classification of compression techniques, Major steps of data compression,
Basic compression techniques: Run length Encoding, arithmetic, Huffman coding, DCT
JPEG: Steps of JPEG Image Compression, Image Preparation, Lossy sequential DCT based mode, Expanded Lossy DCT based mode., lossless, hierarchical mode.
H.261, MPEG, MPEG audio encoding

(10 Hrs, 20 Marks)

Unit – IV
Multimedia database management system, Characteristics of MDBMS, Data analysis, data structure, operations on data, Integration in database model.
User interfaces : General design issues, Video at the user interface, audio at the user interface

(10 Hrs, 20 Marks)

Unit – V
Multimedia Network communications: Quality of multimedia data communication, , Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media on demand, Multimedia over wireless networks.

(10 Hrs, 20 Marks)

Reference Books -

1. Steinmetz & Klara Nahrstedt, “Multimedia Computing Communication & Applications”, Innorative Tech Series.
2. Chapman,” Digital Multimedia” Wiley India.
3. Prabhat, Kiran Thakar, “Multimedia System Design”, PHI

4. Ze-Nian Li, Mark S Drew, “Fundamentals of Multimedia Systems”, Pearson
5. Ranajan Parekh, “Principles of Multimedia”, Tata McGraw Hill
6. Tay Vaughan - “Multimedia, Making it Work.” Vth Ed, Tata McGraw Hill
7. Buford – “Multimedia Systems”, Pearson
8. Vikas Gupta,” Multimedia and Web Design with Tutor CD” Dreamtech Press(Wiley India)

Term Work / List of experiments -

Any six lab assignments should be framed by concern staff member based on above syllabus.

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TERM – I

Theory of Computer Science

Teaching Scheme:
Lectures: 4 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)

Unit – I
Mathematical Preliminaries: Alphabets, Strings, Languages, States, Graphs and trees, Concept of basic machine.
Finite State Machines: State tables, Transition graph, Adjacency matrix, Moore and Mealy FSM’s, Deterministic and Non-deterministic FSM’s, Equivalence of DFA and NFA, FSM with Epsilon moves, Minimization of FSM

(10 Hrs, 20 Marks)

Unit – II
Regular Expressions: Definition, Building RE, Converting DFA’s to RE, Conversion of RE to NFA.
Properties of Regular Sets: Pumping lemma for regular sets, Applications of Pumping lemma, Closure properties of Regular sets, and Decision algorithms for regular sets.

(10 Hrs, 20 Marks)

Unit – III
Grammars: Definition, Production rules, Formalization, Derivation trees, Ambiguous grammar, Removal of ambiguity, Reduced form grammar – Removal of unit productions, Epsilon productions, Useless symbols, Chomsky hierarchy.
Context Free Grammars: Definition, Simplification of CFG, Regular Grammar – Definition, Left linear and right linear regular grammar, Interconversion between left linear and right linear grammar, Reduced Forms – CNF and GNF, Reduction to CNF and GNF, Construction of regular grammar from DFA, Construction of FA from regular grammar.
Context Free Languages: Definition, Properties, Pumping lemma for CFL’s, Decision algorithms for CFL’s, CYK algorithm

(10 Hrs, 20 Marks)

Unit – IV
Pushdown Stack Memory Machines: Definition, PDM examples, Power of PDM, Deterministic and Non-deterministic PDM, PDA and CFL, Construction of PDA from CFG, Construction of CFG from PDA.
Production Systems: Definition, Post canonical system, PMT systems, Acceptors and Generators, Markov algorithm

(10 Hrs, 20 Marks)

Unit – V
Turing Machine: Definition, Notations, Transition diagram, Power of TM over FSM, PDM and PM, Design of TM, Universal TM, Church's Turing Hypothesis, Multi-stack TMs, TM limitations, Halting problem, Undecidability, Tractable and intractable problems

(10 Hrs, 20 Marks)

Reference Books -

1. E V Krishnamurthy, 'Theory of Computer Science', EWP.
2. Hopcroft, Ullman, 'Introduction to Automata Theory' Narosa.
3. K.L.P.Mishra, 'Theory of Computer Science', PHI.
4. Daniel Cohen, 'Introduction to computer Theory', Wiley India.
5. John Martin, 'Introduction to Language and Theory of Computations', TMH.

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TERM – I

Computer Network

Teaching Scheme:
Lectures: 4 Hrs / Week
Practical: 2 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)
Term Work: 25
Oral: 25

Unit – I
Review of Data Communication and Introduction to computer networks.
Data Link layer: Data Link layer design issues, Elementary data link layer protocols, Sliding window protocols, Data Link Layer switching, Bridges 802.x to 802.y, Local inter-networking, Spanning tree and remote bridges.
Review of network connecting devices and multiple access protocols.

(10 Hrs, 20 Marks)

Unit – II
Network Layer: Logical Addressing - IPv4 addresses- Address space, notations, Classful addressing, Classless Addressing, Network Address Translation.IPv6 addresses- Structure and address space
Internet Protocols: Internetworking- Need of network layer, datagram network, connectionless network
IPv4- Datagram, Fragmentation, Checksum, Options
IPv6- Advantages, packet formats, extension headers
Transition from IPv4 to IPv6: Dual stack, Tunneling, Header Translation

(10 Hrs, 20 Marks)

Unit – III
Network Layer: Address Mapping - ARP, RARP, BOOTP and DHCP
ICMP: Types of messages, message formats, error reporting, query, debugging tools
IGMP: Group Management, messages, message format, IGMP operations, Encapsulation, Netstart utility.
ICMPv6: Error reporting and queries
Delivery: Direct versus Indirect delivery
Forwarding: Techniques, process, routing tables

(10 Hrs, 20 Marks)

Unit – IV

Unicast Routing Protocols: Optimization, Intra and Inter domain routing, distance vector routing, link state routing, path vector routing

Multicast Routing Protocols: Unicast, Multicast and Broadcast, applications, routing protocols

Transport Layer: Process to process delivery, UDP

(10 Hrs, 20 Marks)

Unit – V

TCP/IP Protocol Suite: Addressing+

TCP: Services, features, segments, connections, flow control, error control, congestion control

Congestion control: Data Traffic, open- loop, closed- loop congestion control, congestion control in TCP and frame relay

Quality of Service: Flow characteristics and classes, techniques to improve QOS such as Scheduling, Traffic shaping, resource reservation, admission control

Integrated Services: Signaling, flow specification, admission, Service Classes, RSVP, problems with Integrated Services

(10 Hrs, 20 Marks)

Reference Books -

1. Andrew S. Tanenbaum, “Computer Networks”, 4th edition, Pearson.
2. Behrouz Forouzan, “Data Communications and Networking”, TMH, 4th Ed.
3. Irvine,”Data Communication and Networks:An Engg. Approach” Wiley India
4. S. Keshav, “An Engineering Approach to Computer Networking”, Pearson Education, 5th Ed
5. Irvine Olifer,”Computer Networks:Principles,Technologies and Protocols” Wiley India

List of experiments -

1. Study of network resources and various components.
2. TCP/IP Socket Programming.
3. Implementation of Data link layer protocol.
4. Implementation of Network routing algorithm.
5. Implementation of data compression and decompression algorithm (Huffman Algorithm).
6. Implementation of Network security algorithm (Encryption and Decryption Algorithm).
7. Program using FTP to exchange files between computers,
8. Study of proxy server/DNS Server/mail server/NFS server.

1 to 6 assignments are compulsory.

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TERM – I

Computer Graphics

Teaching Scheme:
Lectures: 4 Hrs / Week
Practical: 2 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)
Term Work: 25

Unit – I

Basic Concepts: Introduction to computer graphics, Types of Computer Graphics, Application of Computer Graphics, Graphics Standards, Graphics file formats such as BMP, TIFF, PCX and GIF

Interactive Computer Graphics: Working of Interactive Computer Graphics, Graphics Hardware, CRT, display and controller, Interlaced and non interlaced display, Vector and raster scan display, Random scan display, Frame buffers, Display adapters, VGA, SVGA, Bios video support, Various input devices, Graphics device drivers, Graphics software, Co-ordinates representations, Graphical functions, Plotters, Scanners, Digitizers and Light Pen.

Linear and Circle Generation: Line generation – DDA and Bresenhams /algorithm Thick line generation, Antialiasing, Circle Generation – DDA and Bresenham's Algorithm, Character Generation – Stroke principal, Starburst principle, Bitmap method.

(10 Hrs, 20 Marks)

Unit – II

Polygons: Types, representations, entering polygon, Polygon filling: Fance fill, Edge flag, Seed fill, Edge fill, Scan conversion algorithm. Scan conversion algorithm. Scan conversion: Real time scan conversion, Solid area scan conversion, Run length encoding, Cell encoding.

Segments: Concepts, Segment table, Segment creation, Deletion, Renaming, Image Transformation.

(10 Hrs, 20 Marks)

Unit – III

2D & 3D Geometry: 2D transformation primitives and concepts Translation, Rotation, Rotation about an arbitrary point, Scaling and Shearing, 3 D transformations, Rotation about an arbitrary axis, 3D viewing transformation , Concept of parallel perspective projections, Viewing parameters.

Clipping Fundamentals, Types of clipping.

(10 Hrs, 20 Marks)

Unit – IV

Windowing and Clipping: Viewing transformation, 2 D clipping and 3D clipping, Sutherland Cohen line clipping algorithm, Mid-point subdivision algorithm, Generalized clipping, Cyrus-Beck Algorithm, Interior and Exterior clipping, Polygon Clipping, Sutherland-Hodgman algorithm.

Hidden Surfaces and Lines: Back face removal algorithm, Hidden line methods, Z-buffer, Warnock and Painter algorithm, Floating horizon.

(10 Hrs, 20 Marks)

Unit – V

Light, Color and Shading: Diffused Illumination, Point source illumination, Shading algorithm, Color Models – RGB, HVS, CYM etc Elimination back faces, Transparency, polygons, B-Splines and corner, Bezier Curves, Fractals, Fractal Surfaces and lines

Graphical User Interface: Concepts of X-Windows, Concept of client/server model, Protocols, Message passing (only GUI related) Motif – widget, gadget structure (Only GUI concept) Concept of MS Windows, Open GL, Why 3D? Why Open GL? OpenGL and Animation

Graphics Standard: Introduction to graphics kernel system with basic primitives

Graphics Applications: Scientific and engineering applications, Business applications, Application concept in Animation and concept in Animation and Simulation

(10 Hrs, 20 Marks)

Reference Books -

1. David F. Rogers, "Procedural Elements for Computer Graphics:, Tata McGraw Hill, 2nd Ed
2. Steven Harringtom, "Computer graphics A Programming Approach", MGH
3. Hill, "Computer Graphics using OpenGL", Pearson, 2nd Ed
4. Foley, Vandam, Feiner, Hughes, "Computer Graphics Pricipals & Practice", Pearson LPE, 2nd Ed
5. Donald Hearn and Pauline Baker," Computer Graphics", Pearson LPE, 2nd Ed
6. Rao and Prasad," Graphics user interface with X windows and MOTIF", New Age
7. ISRD, "Computer Graphics", Tata McGraw Hill
8. Mukherjee, "Fundamentals of Computer Graphics and Multimedia", PHI

List of experiments -

1. Study of various Graphics Commands
2. Line generation using DDA
3. Different Line Style using Bresenhams Algorithm
4. Circle Generation using Bresenhams Algorithm
5. Program for Polygon Filling
6. Program for 2D Transformations (Translation, Rotation and Scaling)
7. Program for Segmentation
8. Program for line clipping
9. Program for Polygon clipping
10. Program for 3D rotation
11. Program for Parallel Projections
12. Program for Perspective Projection
13. Program for Animation
14. Program for Bezier Curve
15. Mini Project: Developing some Graphics application
16. Study assignment on any latest GUI application or mini-project.

The term work should include a minimum of ten assignments.

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TERM – I

Systems Programming

Teaching Scheme:
Lectures: 4 Hrs / Week
Practical: 2 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)
Term Work: 50
Oral: 25

Unit – I

Introduction: Introduction to system programming, Types of s/w and application software, System programming and system programs, Need of system software, Assemblers, Loaders, Compilers, Interpreters, Macros, Operating system and formula system, Translators and its types.

Assemblers: Structure of assembler, Basic function, Machine dependent and machine independent features of assembler, Types of assemblers – single pass, multi-pass, cross assembler, General design procedure of assembler, Design of Pass-I and Pass-II assembler (with reference to 8086 assembler), Single pass assembler for IBM PC, Implementation examples – MASM example.

(10 Hrs, 20 Marks)

Unit – II

Macros and Macro Processors: Definition and function of Macro Processor, Features of macro facility, Macro expansion, Nested macros, Design of macro processor – single pass and two pass macro processor, Detailed design of two pass macro processor.

Loaders and Linkage Editors: Basic loader functions, Relocation and linking concepts, Various loader schemes with their advantages and disadvantages, Other loader schemes – binders, Linking loaders, Overlays, Dynamic binders, Design of direct linking loaders, Specification of problem, Specification of data structures, Format of databases.

(10 Hrs, 20 Marks)

Unit – III

Design of a linker, A linker for MS DOS, Linking for overlays

Grammar and scanner, Overview of compilation process, Programming language grammar, Derivation, Reduction and syntax tree, Ambiguity, Regular grammar and regular expression, Basic functions of complier, Machine dependent and machine independent features of compiler, Types of compilers – single pass, multi-pass, cross compiler and pseudo code compiler, Phases of compiler

(10 Hrs, 20 Marks)

Unit – IV

Design of lexical analyser, Software tools for program development YACC and LEX.

Functions of parser, Parsing techniques, Top-down and Bottom-up parsing, Limitations of top-down parsing, Shift reduce and recursive descent parser, Operator precedence parser, Predictive parser, L-R parser, Syntax directed translation (design of parser not expected)

(10 Hrs, 20 Marks)

Unit – V

Symbol table organization and memory allocation, Elementary symbol table organization, Hash tables, Linked list and tree structure symbol tables, Memory allocation – static and dynamic memory allocation.

Dynamic linking in Windows (only introduction and concepts only) – concept of clipboard, OLE terminology and technology, Dynamic Data Exchange, Dynamic Link Libraries (DLL)

(10 Hrs, 20 Marks)

Reference Books -

1. John J. Donovan “System Programming”, TMH
2. Dhamdhere “System Programming & Operating System”, TMH, 2nd Ed
3. L. Beck “System Software”, Pearson, 3rd Ed
4. Aho, Ulman “Compiler Construction” Pearson LPE
5. J P Bennett, “Compiling Techniques”, TMH
6. Dick Grune,”Modern Compiler Design” Wiley India
7. David Galles,”Starting out with Modern Compiler Design” Dreamtech Press(Wiley India

List of experiments -

1. Develop an application to simulate first pass of 2-pass assembler
2. Develop an application to simulate second pass of 2-pass assembler
3. Design a simple loader
4. Develop an application to create a simple text editor
5. Develop an application for simulating Lexical phase of Compiler
6. Develop an application for simulating Syntax Analysis phase of Compiler

The term work should include a minimum of five assignments.

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TERM – I

Advanced Development Tools Laboratory

Teaching Scheme:
Practical: 4 Hrs / Week

Examination Scheme:
Term Work: 50

Part I: Windows Programming
Basic Windows SDK programming, Programming involving Dialog Boxes, Menus and standard GUI components, Writing of Windows Help file using "HC", Writing DLLs and VXDs (Win 95/98/2k)

Part II: Front-End Tools
Assignments based on packages like C# / .NET / VC++ / VB / Java. Assignments should cover basic GUI components, Database Access, ActiveX technology, Network applications.

Part III: Internet Programming Tools
HTML programming, Java Scripts or VB Scripts programming, Internet programming using Java / C# / .NET, (Assignments should cover dynamic page creation) database connectivity (e.g. search engine), online communication (e.g. chatting, email-editor)

Reference Books -

1. Charles Petzold "Programming Windows", Microsoft Press, 5th Ed
2. Herbert Schildt, "Programming Windows 2000 – Ground Up", Tata McGraw Hill
3. Andrew Troelson,"C# and .Net Platform, A Press (Wiley India)
4. Schurman and Pardi, "Dynamic HTML in Action", Microsoft Press, 2nd Ed
5. Sells, "Windows Forms Programming in Visual Basic .NET", Pearson
6. Deitel, "C# How to program", Pearson
7. Bakharia, "Microsoft C# fast and easy web development", PHI
8. Steven Hozner," Java 2(Jdk 5) Progg. Black Book" Dreamtech Press(Wiley India)
9. Ivor Horton,"Beginning VC++" Wrox Press(Wiley India)
10. Steven Hozner ," VB.Net Progg. Black Book" Dreamtech Press(Wiley India)
11. Steven Hozner ,"HTML Black Book" Dreamtech Press(Wiley India)
12. Eric Brown,"Windows Forms in Action" Manning Press(Wiley India

Term work -

Term work should include at least four assignments from each part.

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TERM – II

Management Information Systems

Teaching Scheme:
Lectures: 4 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)

Unit – I
Introduction to information system: Why study information system, Functions of management, Managerial roles, Levels of management, Overview of management system, Operation support system, Management support system, Other classification of IS system, Alternative framework for information system as operational system

(10 Hrs, 20 Marks)

Unit – II
Introduction to concept of system and organization: System concepts, System & their environments, How system works, system approach for problem solving, Importance of feedback, Learning organizations. Internet, Intranet & Enterprise collaboration: Business value of internet, Interactive marketing, Customer value of internet, Internet and Intranet in business, Applications, Resource business value, Roles, Future enterprise collaboration, System concepts & tools

(10 Hrs, 20 Marks)

Unit – III
Operational information system: Accounting & finance, Marketing, Production, Human resource. Management information system & Design support system, Data warehouses, OLTP Vs OLAP, Overview of data mining, Management information system: DSS model and application using decision system, Executive information systems, Characteristics of Decision making process, Features, Components, Tools, Case studies Benefits & Risks of a DSS, GDSS.

(10 Hrs, 20 Marks)

Unit – IV
Planning & Development of MIS. MIS planning strategies, problems in determining information requirement, Business system planning (BSP),BSP study activities, assessment of business problems, Management strategies, organizing the information system plan, application development, Organization & management of information processing.

(10 Hrs, 20 Marks)

Unit – V
Tactical and Strategic information system: Nature of tactical and strategic information systems, Tactical & Strategic information system in Marketing & human resources.
Security & Ethical issues & challenges: Risks, Common control, Common threats, Protection of information system, Ethical issues.

(10 Hrs, 20 Marks)

Reference Books -

1. James A. O'Brien, "Management Information Systems", Tata McGraw Hill
2. W. S. Jawadekar, "Management Information System", Tata McGraw Hill
3. S. Sadagopan, "Management Information System", PHI
4. Robert Schulthesis and Mary Summer, "Management Information System", Tata McGraw Hill

5. Kenneth C Laudon and Jane Laudon, “Management Information System”, Pearson LPE
6. Gerald V. Post &David L. Anderson, “Management Information Systems”, Tata McGraw Hill
7. Mcnurlin, “Information Systems Management in Practice, 6th Ed., Pearson LPE

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TERM – II

Operating Systems

Teaching Scheme:
Lectures: 4 Hrs / Week
Practical: 2 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)
Term Work: 25

Unit – I
Introduction: Need of OS, Evolution of OS, Types of OS like Batch, Timesharing, Multiprogramming, Multitasking, Real-time and Personal OS.
OS Views and Concepts: Shell command language, system calls, user view, OS components, OS structure like monolithic, layered, kernel based, micro-kernel based, virtual machine.
Process and Process management: Process concepts, interleaved CPU and IO operations, CPU burst, Process states, OS services for process management, threading.

(10 Hrs, 20 Marks)

Unit – II
Scheduling: Process scheduling, schedulers – long term, middle term and short term. Scheduling algorithms and performance evaluation.
Inter-process communication and synchronization needs: Mutual exclusion, semaphores, critical regions and monitor. Classical problems in concurrent programming.

(10 Hrs, 20 Marks)

Unit – III
Deadlock: Principles, detection, prevention, avoidance and recovery with Bankers algorithm.
Process management in UNIX: Structure of process, process control, process system calls – fork, join, exec, system boot (No algorithms).
Memory Management: Types, contiguous and non-contiguous, segmentation and paging concepts.

(10 Hrs, 20 Marks)

Unit – IV
Virtual memory management: Concepts, implementation, allocation, fetch and replacement.
Memory management in Unix: Policies, swapping and demand paging
File management: Organization, concepts, files and directories, hierarchical structures, space allocation, free space management
Security and protection: Overview, goals of security and protection, security and attacks, formal and practical aspects of security, authentication and password security.

(10 Hrs, 20 Marks)

Unit – V
File management in Unix: Internal representation of files, inodes
File structure in Unix: Structure of file and directories, super block, inode assignment to a new file. Allocation of disk blocks, file creation, and pipes. (No algorithms)
Mass storage structures, disk scheduling, disk management and swap space management.

Distributed OS: Concepts, design issues and system models.

(10 Hrs, 20 Marks)

Reference Books -

1. Silberschatz, Galvin, Gagne, "Operating System Concepts", John Wiley and Sons, 7th Ed, Wiley India
2. D.M. Dhamdhere, "Operating Systems", Tata McGraw Hill, 2nd Ed.
3. Milenkovic, "Operating Systems Concepts and Design", Tata McGrawHill
4. M.J. Bach, "The design of Unix Operating System", Pearson LPE.
5. Tenenbaum, "Modern Operating Systems", Pearson, 2nd Ed
6. William Stallings, "Operating systems-Internals and design principles", Pearson LPE, 5th Ed.
7. Deitel, "Operating systems", Pearson, 2nd Ed
8. Paul Love, " Beginning Unix", Wrox Press, Wiley India

List of experiments -

1. Study of Unix / Linux commands.
2. Implementation of command interpreter using system calls
3. Simulation of windows explorer
4. Implantation of CPU scheduling algorithm
5. Implementation of Memory Management algorithms – best fit, first fit, worst fit
6. Simulation of page replacement algorithm
7. Implementation of Bankers algorithm
8. Implementation of Inter process communication
9. Implementation of threading
10. Installation of Unix/Linux/Windows server installation with configuration of web-mail and proxy server systems

The term work should include a minimum of six assignments.

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TERM – II

Software Engineering

Teaching Scheme:
Lectures: 4 Hrs / Week
Practical: 2 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)
Term Work: 25
Oral: 50

Unit – I

Introduction: What is and why software engineering? Product: Evolving role of software, Software Characteristics, Components, Applications, Software crisis and Myths, Software Engineering Process, Software development phases and Software Process Models, Prototyping and RAD Model, Water fall, Incremental Model, Spiral Model, 4 GT Model, CASE tools.

(10 Hrs, 20 Marks)

Unit – II
Planning and Managing Software projects:

People, Problem and Process, Measures, Metrics and Indicators, Metrics for software quality, Scoping, Software Project Estimation, Make by decision, Software Acquisition Software risks - Identification, Projection, Assessment, Monitoring Project Scheduling and tracking tasks/Work break down structures, Time line charts, Project plan, CASE tools.

System Engineering: Computer based system, System engineering hierarchy.

Information engineering: Information strategy, Planning Enterprise modelling, Business area analysis, Information flow modelling, Product engineering, System analysis, Feasibility study, Economic and Technical feasibility analysis, Modelling system architecture diagram, CASE tools.

(10 Hrs, 20 Marks)

Unit – III
Requirement Analysis: Communication Techniques, FAST, Quality deployment, Analysis Principals: Modelling, partitioning, Prototyping, Specification,

SRS and SRS review analysis models: Data modelling, Functional modelling, Information flow, Data flow Diagrams, Extension to real time systems, Behavioural models, Mechanism of structural analysis, E-R diagrams, controlled modelling, Data dictionary, CASE tools.

(10 Hrs, 20 Marks)

Unit – IV
Design Fundamentals: Software Design and software design process, principals and concepts, Abstractions, Refinement and modularity, Software architecture, Control hierarchy, Partitioning, Data structure, Information hiding, Effective modular design,

Cohesion, coupling, Design Model, Design documents, CASE tools

Design Methods: Architectural design and design process, transform and transaction flow, design steps, interface design, procedural design, graphical and tabular design notations.

(10 Hrs, 20 Marks)

Unit – V
Software Testing Techniques and Strategies: Software testing fundamentals, Test case design, White box testing, Black box testing, Control structure testing, Strategic approach to testing, Strategic issues, Unit testing, Integration testing, Validation testing, System testing, CASE Tools

Introduction to OOSE.
Introduction Unified Modeling Language (UML)

(10 Hrs, 20 Marks)

Reference Books -

1. Pressman, “Software Engineering”, McGraw Hill, 6th Ed
2. Ghezzi, Jazayeri, Mandrioli, ”Fundamentals of Software Engineering”, Pearson/PHI, 2nd Ed
3. Peters,” Software Engineering” Wiley India
4. Sommervile, “Software Engineering”, Pearson, 7th Ed
5. Rajib Mall, “Fundamentals of Software Engineering”, PHI, 2nd Ed

6. Javadekar, “Software Engineering” Tata McGraw Hill
7. Pfleeger,” Software Engineering : Theory & Practice”,6th Edition-Pearson LPE
8. Thayer ,”Software Engineering Project Management “2nd edition, Wiley India
9. Tian ,”Software Quality Engineering” 2nd Edition, Wiley India

Term Work-

The term work should include a minimum of four software mini projects covering problem definition, analysis, design and documentation for each.

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TERM – I

Database Management System

Teaching Scheme:
Lectures: 4 Hrs / Week
Practical: 2 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)
Term Work: 25
Practical: 25

Unit – I
Introduction to DBMS: Basic concepts, advantages of a DBMS over file processing system, Data abstraction, Data models and data independence, components of a DBMS and overall structure. Database terminology
Database administration issues: DBA role, indexes. Data dictionary, security, backups, Replication, SQL support for DBA, commercial RDBMS selection
Data modeling: Basic concepts, types of data models, E-R data model and Object oriented data model, relational, network and hierarchical data models and their comparison, E-R and ERR diagramming.

(10 Hrs, 20 Marks)

Unit – II
Relational Model: Basic concepts, attributes and domains, interaction and extensions of a relation, concept of integrity and referential constraints. Relational query languages (relational algebra, relational calculus), concepts of view and trigger

(10 Hrs, 20 Marks)

Unit – III
SQL: Structure of a SQL query, DDL and DML, SQL queries, set operations. Predicates and join membership, tuple variables, set comparison, ordering of tuples, aggregate functions, nested query. Database modification using SQL, Dynamic and embedded SQL and concepts of stored procedure, Query optimization

(10 Hrs, 20 Marks)

Unit – IV
Relational database design: Need of normalization, Notation of a normalized relation, Normalization using functional dependency, Multi-valued dependencies and join dependency, 1NF, 2NF, 3NF, BCNF, 4NF.
Transaction Management: Basic concepts of transaction, components of transaction management (concurrency control, Recovery system), Different concurrency control protocols such as Time stamps

and locking, different crash recovery such as log based recovery and shadow paging, concepts of cascaded abort, Multi-version concurrency control methods.

(10 Hrs, 20 Marks)

Unit – V

Object oriented DBMS: Review of object oriented concepts: Objects, Classes, attributes, Messages, Inheritance, and Polymorphism etc. Object schemas, Class subclass relationships, inter-object relationships, features of object oriented DBMS and ORDBMS, concepts of OID, persistence of objects in OODBMS, Physical organization, object-oriented queries, schemas modifications, Temporal databases, Active databases.

(10 Hrs, 20 Marks)

Reference Books -

1. Singh," Database Systems: Concepts,Design & Apllication"- Pearson LPE
2. Kahate, " Introduction to Database Management Systems"- Pearson LPE
3. Henry F. Korth, Abraham silberschatz, "Database system concepts", 5th Ed.Mc Graw Hill Inc.
4. Date, "Introduction to Database Management Systems", 8/e Pearson LPE.
5. Rajesh Narang, "Database Management System", PHI
6. Elmasri, Navathe, Somayajulu, Gupta, "Fundamantals of Database Systems", Pearson
7. ISRD, "Introduction to Database Management System", Tata McGraw Hill
8. Connolly, " Database Systems" – Pearson LPE.
9. Bipin Desai, "Introduction to database management systems", Galgotia.
10. Renu Vig, "Fundamentals of database management systems", ISTE learning materials centre
11. Phillip Pratt, "Concepts of DBMS", Thomson Learning, 3rd Ed.
12. Phillip Pratt, "A Guide to SQL", Thomson Learning, 5th Ed.
13. V.K.Jain, " Database Management System" Dreamtech Press (Wiley India)
14. Oracle Sql,Pl/Sql for 9i and 10 g, Dreamtech Press(Wiley India)
15. Andy Oppel, " Rational Databases-Principles and Fundamentals, Dreamtech Press(Wiley India)
16. Paul Wilton," Beginning SQL" Wrox Press, (Wiley India)

List of experiments -

1. Creating a sample database application using conventional file processing mechanism and "C" language. The program should provide facilities for retrieving, adding, deleting and modifying records
2. Prepare an E-R diagram for the given problem definition. Prepare and verify a relational database design using concepts of normalization techniques in appropriate normal form.
3. Creating a sample database file and indexes (for the design made in experiment No. 2) using any client server RDBMS (oracle/Sybase) package using SQL DDL queries. This will include constraints (key reference etc.) to be used while creating tables.
4. SQL DML queries: Use of SQL DML queries to retrieve, insert, delete and update the database created in experiment No. 3. The queries should involve all SQL features such as aggregate functions, group by, having, order by, sub queries and various SQL operators.
5. PL/SQL: Fundamentals of cursors, stored procedures, stored functions.
6. Screen design and Report generation: Sample forms and reports should be generated using Developer 2000 (in case of Oracle) or through Power builder or Visual basic front end tools or any prototyping software engineering tool.
7. Prototype of OODBMS/ Active database/ Temporal Database in C++

The term work should include a minimum of six assignments.

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TERM – II

Web Design

Teaching Scheme:
Lectures: 4 Hrs / Week
Practical: 4 Hrs / Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)
Term Work: 25
Oral: 50

Unit – I
Basic of Web Design, Web design process, Web site evaluation procedure, website design principles, Developing Effective Web Strategy, Server Issues : Discuss Pros and Cons of having own server with hiring server, Domain name issues (Choosing registration etc.) Website User Requirements and Interaction, Marketing on Internet.

(10 Hrs, 20 Marks)

Unit – II
Website Organisation, Site Types and Architecture, Navigation Theory and Practice, Use of Graphics, Marketing Site Appealing, Search and Design, Site Maps Indexes, Other Navigational and Use Aids, Basic of Web Page Design : Page Types, Layouts, Text and Fonts, Colour, Images and Backgrounds. Making Use of Mail Delivery Systems, Online Customer Services, Online payments

(10 Hrs, 20 Marks)

Unit – III
History of HTML, DTD, CSS, HTML Documents Representation, Character Encoding Set, HTML Elements, Attributes, Entity References (Numeric, Character)

Structure of HTML Documents, Discuss all Block Level Tags, Text Level Tags, Linking Tags, Images Maps, Tables, Frames, Forms, Integration With CGI, Integrating Components in a HTML Page

(10 Hrs, 20 Marks)

Unit – IV
Web Mastering Skills and Roles: Internet Specialist, Information Design Scientist, Media Designer, Technical Designer, Technical Manager Etc. Web Site Security Issues, Website publishing and maintaining Procedure

(10 Hrs, 20 Marks)

Unit – V
Introduction to XML, XML Advantages, XML implementations, XML Approach to Web Designing, Logical and Physical Structures of XML Documents, XML Prolog, DTD, Elements, Attributes, Entities, Linking in XML, Style Sheets, XML Processor, Morphing HTML into XML.

(10 Hrs, 20 Marks)

Reference Books -

1. Thomas A Powell, “The Complete Reference – Web Design”, TMH, 2nd Ed

2. Daniel Gary,"Web Design Fundamental Handbook" Dreamtech Press(Wiley india)
3. Wynkoop, "Running a perfect web site", PHI
4. Lehnert,"Web 101: making the Network for You",- Pearson LPE
5. James L Mohler, "Teach Yourself How to Become a Webmaster in 14 Days", Samsnet, Techmedia
6. Richard Light, "Presenting XML", Sams, Macmillan Computer Publishing
7. Joel Sklar, "Principles of Web Design", Thomson Learning
8. James L. Mohler, Jon M. Duff, "Designing Interactive Web Sites", Thomson Learning
9. Kathleen Kalata, "Internet Programming with VBScript and JavaScript", Thomson Learning
10. Vikas Gupta," Comdex multimedia and Web Design with Tutor CD," Dreamtech Press(Wiley India)
11. Jon Duckett," Beginning Web Proggramming" Wrox Press(Wiley India)
12. Bryan, "HTML,XHTML and CSS Bible", Wiley India.

List of experiments -

1. Detail Study of at least one of the Web Servers like PWS, IIS, Apache, Java Webserver.
2. Detail Study of and HTML Authoring Tool: Netscape Composer/Front page/First Page etc.
3. Detail Study of One Imaging Tool
4. Design, Publish a Website with not less than 15 full size pages for a selected topic (Commercial, Institute, Portal or decided jointly by the student and teacher). Exercise the Web Mastering Skills in various phases of the development of the site.
5. Develop an XML application for Inventory Control, Museum Information System or on the topic given by the teacher
6. Design Active Web Page Using any Scripting Language.

The term work should include a minimum of Five assignments.

NORTH MAHARASHTRA UNIVERSITY, JALGAON

TE (COMPUTER ENGINEERING / INFORMATION TECHNOLOGY)
(w.e.f. 2007-08)

TERM – II

Practical Training/Mini Project/Special Study

Examination Scheme:
Term Work: 25

Every student needs to complete following requirements for term work of Practical Training / Special Study / Mini Project.

Practical training in any industry for a period of minimum two weeks and submit training report certified by personnel manager or works manager or any other higher authority of that industry.

OR

Special study on a recent topic from reported literature and submit a report on it

OR

One mini Theoretical or development project and submit a report on it.

Notes:

1. Practical training is to be undergone in summer vacation after SE and / or in winter vacation after first term of TE.

2. Report should be typed on A4 size paper and two copies paper bounded are to be prepared, one copy for the candidate, and one for the library.

North Maharashtra University, Jalgaon
New Syllabus with effect from Year 2008-09
BE (Information Technology)
Term I

Sr. No	Subject	Teaching Scheme per Week			Examination Scheme				
		L	T	P	Paper Hr.	Paper	TW	PR	OR
1	Elective I	4	-	2	3	100	25	-	25
2	Enterprise Resource Planning	4	-	-	3	100	25	-	-
3	Advanced Unix Programming *	4	-	2	3	100	25	25	-
4	Object Oriented Modeling and Design *	4	-	2	3	100	25	-	25
5	E-Commerce	4	-	-	3	100	-	-	-
6	Seminar	-	-	2	-	-	25	-	-
7	Project I			2		-	25	-	25
	Total	20	0	10		500	150	25	75
	Grand Total	**30**			**750**				

Elective I
1. Operational Research * 2. Embedded Systems *
3. Image Processing *

BE IT
Term II

Sr. No	Subject	Teaching Scheme per Week			Examination Scheme				
		L	T	P	Paper Hr.	Paper	TW	PR	OR
1	Elective II	4	-	2	3	100	25	-	25
2	Data Warehousing and Mining *	4	-	2	3	100	25	-	25
3	Software Metrics and Quality Assurance *	4	-	2	3	100	25	-	25
4	Internet Security	4	-	2	3	100	25	-	-
5	Industrial Visit / Case Study		-			-	25	-	-
6	Project II		-	6	-	-	100	-	50
	Total	16	0	14		400	225		125
	Grand Total	**30**			**750**				

Elective II
1. Artificial Intelligence and Neural Networks 2. Mobile Network *
3. Information Retrieval

* Common subject with BE Computer

NORTH MAHARASHTRA UNIVERSITY, JALGAON

BE (COMPUTER ENGINEERING / IT)
(w.e.f. 2008-09)

TERM – I

Elective – I
Operation Research

Teaching Scheme:
Lectures: 4 Hrs./ Week
Practical: 2 Hrs./ Week

Examination Scheme:
Theory Paper: 100 Marks (03 Hrs.)
Term Work: 25
Oral: 25

Unit – I **(10 Hrs. 20 Marks)**

Introduction to Operation Research – Modeling in operation research, principles of modeling, Main phases of operation research, scope, role of operation research in decision making, linear programming, model formulation, graphical method, simplex method, advantages of Linear Programming.

Unit – II **(10 Hrs. 20 Marks)**

Dynamic Programming - Introduction ,Basic concepts and applications, characteristics of dynamic programming approach, special techniques of Linear programming, Transportation problems, North – West corner rule, Least cost method, Vogel's approximation method, Balanced and unbalanced problems, Assignment problems, Hungarian method, balanced and unbalanced problems, traveling sales man problem.

Unit – III **(10 Hrs. 20 Marks)**

Project Planning Using PERT/CPM : Phases of project management, construction of network or arrow diagrams, time estimates, earliest expected time, latest allowable time and slack, critical path computations for PERT, calculations on CPM networks various floats for activities, critical path, Difference between CPM and PERT , Project time Vs project cost, use of CPM/PERT in project management.

Unit – IV **(10 Hrs. 20 Marks)**

Replacement Model – Deterministic and probabilistic considerations, Replacement of old equipment by the most efficient by the sudden failure items, failure trees, examples of failure trees, sequencing model Terminology and notations, Principles assumptions, Solution of sequencing problems, Processing of n jobs through two machines, Processing n jobs through three machines, Two jobs through m machines, Processing n jobs through m machines .

Unit – V **(10 Hrs. 20 Marks)**

Decision theory and game theory: Decision trees, classes of decision model, decision under certainty, uncertainty and risk.

Game Theory: Theory concept characteristics, maximum and minimum principles saddle points, dominance, basic concept, terminology of two persons zero sum game, MXZ and ZX games subgames methods, graphical method.

Reference Books:

1. N. D. Vohra, Quantitative Techniques in Management, TMH
2. Taha H. A., Operation Research – An Introduction PHI
3. S. D. Sharma, Operation Research, Kedarnath Ramnath Compay
4. N. G. Nair, Operation Research, Dhanpat Rai
5. Prem kumar Gupta, D. S. Hira, Operation Research, S. Chand & Company
6. L. S. Srinath, PERT and CPM Principles & Applications, EWP

Term work:

Assignment based on:

1. Implementation of Linear Programming Model

2. Implementation of Simplex Method
3. Implementation of Dynamic Programming
4. Implementation of transportation model
5. Implementation of assignment model
6. Implementation of Traveling Sales man problem
7. Implementation of sequencing model
8. Implementation for replacement model
9. Game playing with min / max search
10. Program for decision tree

Any Five Lab Assignment should be framed by concern staff member based on above list.

NORTH MAHARASHTRA UNIVERSITY, JALGAON

BE (COMPUTER ENGINEERING / IT)
(w.e.f. 2008-09)

TERM – I

Elective – I
Embedded Systems

Teaching Scheme:
Lectures: 4 Hrs./ Week
Practical: 2 Hrs./ Week

Examination Scheme:
Theory Paper: 100 Marks (03 Hrs.)
Term Work: 25
Oral: 25

Unit – I **(10 Hrs. 20 Marks)**

Embedded system Introduction

Introduction to Embedded System, History, Design challenges, optimizing design metrics, time to market, applications of embedded systems and recent trends in embedded systems, embedded design concepts and definitions, memory management, hardware and software design and testing, communication protocols like SPI, SCI, I2C, CAN etc

Unit – II **(10 Hrs. 20 Marks)**

System Architecture

Introduction to ARM core architecture, ARM extension family, instruction set, thumb Instruction set, Pipeline, memory management, Bus architecture, study of on-chip peripherals like I/O ports, timers, counters, interrupts, on-chip ADC, DAC, RTC modules, WDT, PLL, PWM, USB etc.

Unit – III **(10 Hrs. 20 Marks)**

Interfacing and Programming

Basic embedded C programs for on-chip peripherals studied in system architecture. Need of interfacing, interfacing techniques, interfacing of different displays including Graphic LCD (320X240), interfacing of input devices including touch screen etc, interfacing of output devices like thermal printer etc., embedded communication using CAN and Ethernet, RF modules, GSM modem for AT command study etc.

Unit – IV **(10 Hrs. 20 Marks)**

Real time Operating System Concept

Architecture of kernel, task scheduler, ISR, Semaphores, mailbox, message queues, pipes, events, timers, memory management, RTOS services in contrast with traditional OS. Introduction to uCOSII RTOS, study of kernel structure of uCOSII, synchronization in uCOSII, Inter-task communication in uCOSII, memory management in uCOSII, porting of RTOS.

Unit – V **(10 Hrs. 20 Marks)**

Embedded Linux

Introduction to the Linux kernel, Configuring and booting the kernel, the root file system, Root file directories, /bin, /lib etc., Linux file systems, Types of file system: Disk, RAM, Flash, And Network. Some debug techniques- Syslog and strace, GDB, TCP/IP Networking- Network configuration, Device control from user space- Accessing hardware directly, Multi processing on Linux and Inter Process Communication- Linux process model and IPCs, Multithreading using pThreads - Threads vs. Processes and pThreads, Linux and Real-Time- Standard kernel problems and patches.

Reference Books:

1. Rajkamal, “Embedded Sytems “, TMH.
2. David Simon, “Embedded systems software primer”, Pearson
3. Steve Furber, “ARM System-on-Chip Architecture”, Pearson
4. DR.K.V.K.K. Prasad, “Embedded /real time system”, Dreamtech
5. Iyer,Gupta, “Embedded real systems Programming“, TMH

Laboratory exercise

- Integrated Development Environment Overview (Project creation, down load & debug)
- Study of JTAG Debugger/on-board debugger-emulator.
- ARM Instructions execution (Barrel Shifter, LDR/STR, SMT/LDM)

Term Work:

Group - A

1) Writing basic C-programs for I/O operations
2) C-Program to explore timers/counter
3) C-programs for interrupts
4) Program to demonstrate UART operation

Group - B

5) Program to demonstrate I2C Protocol.
6) Program to demonstrate CAN Protocol.

Group - C

7) Program to interface LCD
8) Program to interface Keyboard and display key pressed on LCD
9) Program to interface stepper motor

Group - D

10) Program to demonstrate RF communication
11) Program to implement AT commands and interface of GSM modem
12) Implementation of USB protocol and transferring data to PC.
13) Implementation of algorithm /program for the microcontroller for low power modes.
uCOSII /Embedded Linux RTOS Examples

Group - E

14) Interfacing 4 x 4 matrix keyboards and 16 x 2 character LCD display to microcontroller / microprocessor and writing a program using RTOS for displaying a pressed key.
15) Writing a scheduler / working with using RTOS for 4 tasks with priority. The tasks may be keyboard, LCD, LED etc. and porting it on microcontroller/ microprocessor.

Group - F

16) Implement a semaphore for any given task switching using RTOS on microcontroller board.
17) Create two tasks, which will print some characters on the serial port, Start the scheduler and observe the behavior.

Group – G

18) RTOS based interrupt handling using Embedded Real Time Linux.
19) Program for exploration of (Process creation, Thread creation) using Embedded Real Time Linux.

Group – H

20) Program for exploring Message Queues using Embedded Real Time Linux.
21) Ethernet Based Socket Programming using Embedded Real Time Linux.

Note: 1) At least one practical should be performed from each group.
2) Two practicals should be performed using the JTAG debugger/on-board Debugger-emulator.

Term work will be based on above list.

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(w.e.f. 2008-09)

TERM – I

Elective – I
Image Processing

Teaching Scheme:	**Examination Scheme:**
Lectures: 4 Hrs./ Week	Theory Paper: 100 Marks (03 Hrs.)
Practical: 2 Hrs./ Week	Term Work: 25
	Oral: 25

Unit – I **(10 Hrs. 20 Marks)**

Introduction - What is digital image processing?, Fundamental steps in digital image processing, A simple Image formation model, Image sampling and quantization , Representing Digital Images, Basic relationship between pixels,

Image Enhancement in the spatial domain: Basic Gray level transformations, Histogram Processing(Equalization, Matching), Basics of spatial filtering, Smoothing spatial filters, Sharpening spatial filters.

Unit – II **(10 Hrs. 20 Marks)**

Image Enhancement in the frequency domain: Fourier Transform and Frequency domain, Filtering in the frequency domain, Basics of filtering in the frequency domain, Basic filters and their properties, Smoothing Frequency domain filters, Sharpening Frequency domain filters, Homomorphic Filtering
Properties of 2 D Fourier Transform, The Convolution and Correlation Theorems

Unit – III **(10 Hrs. 20 Marks)**

Image Restoration: Model Of Image Restoration/ Degradation Process, Noise Models, Restoration in the presence of Noise- Spatial Filtering, Periodic Noise Reduction by Frequency Domain Filtering, Filtering Techniques to restore image.

Image Compression- Compression models- Lossy Compression- Lossless Compression.

Unit – IV **(10 Hrs. 20 Marks)**

Color Image Processing : Color Fundamentals, Color Models, Converting Colors from different color models, Gray Level to Color Transformations, Color Transformations, Color Slicing, Color Image Smoothing.

Morphological Image Processing
Basic Concepts, Dilation, Erosion, Thinning, Thickening, Pruning, Gray level Morphology

Unit – V **(10 Hrs. 20 Marks)**

Segmentaion- Edge linking and Boundary detection, Thresholding, Region Based Segmentation, Histogram Analysis,

Application of Image Processing,

Introduction to Content Based Image Retrieval.

Reference Books:

1. R.C. Gonzalez, R.R. Woods, Digital Image Processing Person Education, Pearson Education
2. B. Chanda, D.Datta Mujumdar, “Digital Image Processing And Analysis”, PHI ,
3. William Pratt, “Digital Image Processing”, John Willey & Sons
4. Anil Jain, “Fundamentals Of Digital Image Processing”, PHI

Term work:

1. Develop C/C++ code to create a simple image and save the same as bitmap image in .bmp file.
2. Develop C/C++ code to implement basic gray level transformations(Any One)
3. Develop C/C++ code to perform basic image enhancement operations
4. Develop C/C++ code to implement image histogram processing (Equalization or Matching)
5. Develop C/C++ code to find basic relationship between pixels.(Any One)
6. Develop C/C++ code to implement image compression (any one algorithm)
7. Implement gray scale thresholding to blur an image.
8. Implement C/C++ code to implement an algorithm for edge detection.
9. Implement C/C++ code to implement image morphological operations.(Any One)

The term work will be based on any 5 assignments from above list.

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TERM – I

Enterprise Resource Planning

Teaching Scheme:
Lectures: 4 Hrs./ Week

Examination Scheme:
Theory Paper: 100 Marks (03 Hrs.)
Term Work: 25

Unit – I **(10 Hrs. 20 Marks)**

Introduction to ERP, Evolution of ERP, What is ERP? Reasons for the growth of ERP, Scenario and justification of ERP in India, Evaluation of ERP, Various modules of ERP, Advantages of ERP, An overview of Enterprise, Integrated Management of Information, Business Modeling ERP for Small Business, ERP for Make to Order Companies

Unit – II **(10 Hrs. 20 Marks)**

Business Process Mapping for ERP Module Design, Hardware Environment and its selection for ERP implementation, ERP and Related Technologies, Business Process Reengineering (BPR), Management Information Systems (MIS), Executive Information Systems (EIS), Decision Support System (DSS), Supply Chain Management (SCM)

Unit – III **(10 Hrs. 20 Marks)**

ERP Modules: Introduction, Finance, Plant Maintenance, Quality Management, Materials Management, ERP Market: Introduction, SAP AG, Baan Company, Oracle Corporation, People Soft, JD Edwards, World Solutions Company, System Software Associates, Inc. (SSA), QAD, A comparative assessment and selection of ERP packages and modules

Unit – IV **(10 Hrs. 20 Marks)**

ERP Implementation Lifecycle, Issues in implementing ERP packages, Pre-evaluation Screening, Package Evaluation, Project Planning Phase, Gap Analysis, Reengineering, Configuration, Implementation, Team Training, Testing, Going Live, End-user Training, Post-implementation (Maintenance mode)

Unit – V **(10 Hrs. 20 Marks)**

Vendors, Consultants and Users, In-house Implementation – Pros and Cons, Future directions in ERP,

New Markets, New Channels, Faster Implementation Methodologies, Business Models and BAPIs, Convergence on Windows NT, Application platforms, New Business Segments, More features, Web Enabling, Market Snapshots.

Reference Books:

1. S. Sadagopan, "ERP – A Managerial Perspective", Tata McGraw Hill
2. Alexis Leon, "Enterprise Resource Planning", Tata McGraw Hill
3. Vinod Kumar Garg, N.K Venkitakrishna, "ERP Concepts and Practice", PHI
4. Henandez, "The SAP R/3 Handbook", 2nd ED., Tata McGraw Hill

Term Work:

It should contain at least 6 lab assignments covering the above syllabus.

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TERM – I

Advanced Unix Programming*

Teaching Scheme:
Lectures: 4 Hrs./ Week
Practical: 2 Hrs./ Week

Examination Scheme:
Theory Paper: 100 Marks (03 Hrs.)
Term Work: 25
Practical: 25

Unit – I **(10 Hrs. 20 Marks)**

UNIX System Overview – Introduction, UNIX Architecture, Logging In, Files and Directories, Input and Output, Programs and Processes, Error Handling, User Identification, Signals, Time Values, System Calls and Library Functions.

File I/O – Introduction, File Descriptors, open Function, creat Function, close Function, lseek Function, read Function, write Function, I/O Efficiency, File Sharing, Atomic Operations, dup and dup2 Functions, sync, fsync, and fdatasync Functions, fcntl Function, ioctl Function, /dev/fd.

Files and Directories – Introduction, stat, fstat, and lstat Functions, File Types, Set-User-ID and Set-Group-ID, File Access Per missions, Ownership of New Files and Directories, access Function, umask Function, chmod and fchmod Functions, Sticky Bit, chown, fchown, and lchown Functions, File Size, File Truncation, File Systems, link, unlink, remove, and rename Functions, Symbolic Links, symlinkand readlink Functions, File Times, utime Function, mkdirand rmdir Functions, Reading Directories, chdir, fchdir, and getcwd Functions, Device Special Files, Summary of File Access Per mission Bits.

Unit – II **(10 Hrs. 20 Marks)**

System Data Files and Information – Introduction, Password File, Shadow Passwords, Group File, Supplementary Group Ids, Implementation Differences, Other Data Files, Login Accounting, System Identification, Time and Date Routines.

Process Environment – Introduction, main Function, Process Termination, Command-Line Arguments, Environment List, Memory Layout of a C Program, Shared Libraries, Memory Allocation, Environment Variables, setjmp and longjmp Functions, getrlimit and setrlimit Functions.

Process Control – Introduction, Process Identifiers, fork Function, vfork Function, exit Functions, wait and waitpid Functions, waitid Function, wait3 and wait4Functions, Race Conditions, exec Functions, Changing User IDs and Group IDs, Interpreter Files, system Function, Process Accounting, User

Identification, Process Times.

Unit – III **(10 Hrs. 20 Marks)**

Signals – Introduction, Signal Concepts, signal Function, Unreliable Signals, Interrupted System Calls, Reentrant Functions, SIGCLD Semantics, Reliable-Signal Terminology and Semantics, kill and raise Functions, alarm and pause Functions, Signal Sets, sigprocmask Function, sigpending Function, sigaction Function, sigsetjmp and siglongjmp Functions, sigsuspend Function, abort Function, system Function, sleep Function, Job-Control Signals, Additional Features.

Advanced I/O – Introduction, Nonblocking I/O, Record Locking, STREAMS, I/O Multiplexing, 2 poll Function, Asynchronous I/O, readv and writev Functions, readn and written Functions, Memory-Mapped I/O.

Unit – IV **(10 Hrs. 20 Marks)**

Threads – Introduction, Thread Concepts, Thread Identification, Thread Creation, Thread Termination, Thread Synchronization.

Thread Control – Introduction, Thread Limits, hread Attributes, Synchronization Attributes, Reentrancy, Thread-Specific Data, Cancel Options, Threads and Signals, Threads and fork, Threads and I/O.

Daemon Processes – Introduction, Daemon Characteristics, Coding Rules, Error Logging, Single-Instance Daemons, Daemon Conventions, Client-Server Model.

Unit – V **(10 Hrs. 20 Marks)**

Interprocess Communication – Introduction, Pipes, popen and pclose Functions, Coprocesses, FIFOs, XSI IPC, Message Queues, Semaphores, Shared Memory, Client-Server Properties.

Network IPC: Sockets – Introduction, Socket Descriptors, Addressing, Connection Establishment, Data Transfer, Socket Options, Out-of-Band Data, Nonblocking and Asynchronous I/O.

Advanced IPC – Introduction, STREAMS-Based Pipes, Unique Connections, Passing File Descriptors, An Open Server, Version 1, An Open Server, Version 2.

Reference Books:

1. W. Richard Stevens and Stephen A. Rago, Advanced Programming in the UNIX Environment, 2/E, Pearson Education
2.W. Richard Stevens, Unix Network Programming - Interprocess Communications, Volume 2, 2/E, Pearson Education

Term Work:

Concerned staff members should suitably frame the term work (at least 6) based on above syllabus and implementation of Unix commands using library functions as well as implementation of shell scripts.

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TERM – I

Object Oriented Modeling and Design

Teaching Scheme:
Lectures: 4 Hrs./ Week
Practicals: 2 Hrs./Week

Examination Scheme:
Theory Paper: 100 Marks (03 Hrs.)
Term Work: 25 Marks
Oral: 25 Marks

Unit – I **(10 Hrs. 20 Marks)**

Review of Object Modeling, New Paradigms, Object Oriented Thinking, UML Concepts: Overview of UML.
UML 2.0 New Features.
Rational Unified Process emphasizing Inception, Elaboration, Construction, Transition Phases. 4+1 View architecture, Architectural approaches: Use case Centric, Architecture driven, Iterative approach, OO Concepts Review.

Unit – II **(10 Hrs. 20 Marks)**

Introduction to UML. UML MetaModel. Extensibility mechanisms like stereotypes, tagged values, constraints and profiles. OCL. Overview of all diagrams in UML 2.0.

Unit – III **(10 Hrs. 20 Marks)**

Object diagrams, CRC method, Review of OO concepts. Class diagrams, Classes and Relationships, Interfaces and ports, Templates, Active Objects, Advanced relationships generalization, association, aggregation, dependencies. Composite structure diagrams including composite structures, collaborations.

Unit – IV **(10 Hrs. 20 Marks)**

Interaction diagrams. Interaction Overview diagrams including interactions, signals, exceptions, regions, partitions, Sequence diagrams, Communication diagrams.
State Machine diagrams, States, encapsulation of states, transitions, submachine, state generalization. Timing diagrams, Activity diagrams, Activities, sub activities, signals, exceptions, partitions, regions.

Unit – V **(10 Hrs. 20 Marks)**

Support for modeling Architecture in UML. Package diagrams, Component diagrams, Deployment diagrams. Applications of UML in embedded systems, Web applications, commercial applications.

Reference Books:

1. Grady Booch, James Rumbaugh, Ivar Jacobson “Unified Modeling Language User Guide”, Addison-Wesley
2. Joseph Schmuller “SAMS Teach yourself UML in 24 Hours”, Third edition.
3. Martin Fowler, “UML Distilled: A Brief Guide to the Standard Object Modeling Language”, Third Edition (Paperback) ,Addision Wesley
4. Dan Pilone, Neil Pitman “UML 2.0 in a Nutshell”, O'Reilly
5. Rambaugh, “Object Oriented Modeling and Designing”. PHI
6. Bouch. “Object Oriented Analysis and Design with Applications”. Addison Wesley.
7. Schah, “Introduction to OOAD with UML and Unified Process”, TMH

Term Work:

Concerned staff members should suitably frame the term work at least 5 assignments based on above

syllabus. Each assignment must consider definition, analysis, design and modeling of a project.

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TERM – I

E-Commerce

Teaching Scheme:
Lectures: 4 Hrs./ Week

Examination Scheme:
Theory Paper: 100 Marks (03 Hrs.)

Unit – I **(10 Hrs. 20 Marks)**

Overview of electronic commerce- Introduction, Definition of Electronic Commerce, Electronic Business, Potential benefits of electronic commerce, Impact of Electronic Commerce on business model, Overall Business and E-commerce goal congruence, The impact of electronic commerce security, Implications for the Accounting profession.

Unit – II **(10 Hrs. 20 Marks)**

Electronic Commerce and the role of Independent Third parties – Introduction, Consulting practices and Accountants Independence, CPA Vision Project, New assurance services identified by AICPA, The Elliott committee and the Cohen Committee, Impact of electronic commerce on the traditional assurance function, Third party assurance of Web based electronic commerce.

Unit – III **(10 Hrs. 20 Marks)**

EDI, Electronic commerce and the Internet – Introduction, traditional EDI Systems, data transfer and standards, Financial EDI, EDI Systems and the internet, Impact of EDI- Internet applications on the accounting profession. PGP Email, Encryption Software.

Unit – IV **(10 Hrs. 20 Marks)**

Risks of Insecure Systems – Introduction, Internet Associated Risks, Social Engineering, Risk associated with Business transaction data transferred between Trading and Partners. Risk associated with Viruses and malicious code overflows, Implications for the accounting profession. Fire walls security issues, Authentication.

Unit – V **(10 Hrs. 20 Marks)**

Electronic Commerce Payment Mechanism – Introduction, The SET Protocol, Magnetic Strip cards, smart cards, Electronic checks, Electronic cash.

Reference Books:

1. Greenstein, Feinnon, " Electronic Commerce", Tata McGraw Hill Edition
2. Ravi Kalakota, et al, " Electronic Commerce – A Manager's Guide", Addison Wesley Longman.

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TERM – I

Seminar

Teaching Scheme:
Practical: 2 Hrs./ Week

Examination Scheme:
Term Work: 25 Marks

1. For seminar every student will individually study a topic assigned to him / her and submit a report and shall deliver a short lecture / Seminar on the topic at the end of term.
2. Selection of topic should be done by students in consultation with concerned guide
    a. Topic should be related to branch but it should be extended part of the branch (latest and advance topic).
    b. The topic should be such that the student can gain latest knowledge. Student should preferably refer at least one research paper
3. Seminar topic should not be repeated in the department and registration of the same should be done on first come first served basis
4. Seminar report should be submitted in paper bound copy prepared with computer typing
    a. Size of report depends on advancement of topic.
    b. Student should preferably refer minimum 5 reference books / magazines.
    c. Format of content
        i. Introduction.
        ii. Literature survey.
        iii. Theory
            1. Implementation
            2. Methodology
            3. Application
            4. Advantages, Disadvantages.
        iv. Future scope.
        v. Conclusion.
5. ASSESSMENT OF SEMINAR for TERM WORK
    Title of seminar : _____
    Name of guide : _____

Sr. No.	Exam Seat No.	Name of Student	Assessment by examiners					Grand Total
			Topic Selection	Literature Survey	Report Writing	Depth of understanding	Presentation	
			5	5	5	5	5	25

6. Assessment of Literature survey will be based on
    a. collection of material regarding history of the topic,
    b. implementation,
    c. recent applications.

7. Assessment of Depth of understanding will be based on
    a. Questioning by examiners.
    b. Questioning by students.
    c. What the student understands i.e. conclusion regarding seminar.

8. Assessment of presentation will be based on;
    a. Presentation time (10 minutes)
    b. Presentation covered (full or partial)
    c. Way of presentation
    d. Questioning and answering (5 minutes)
9. Examiners should be a panel of two one of them must be guide. Examiner must have experience at least 3 years. Examiners will be appointed by HOD in consultation with Principal.

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TERM – I

Project - I

Teaching Scheme:	**Examination Scheme:**
Practical: 2 Hrs./ Week	Term Work: 25
	Oral: 25

1. Every student individually or in a group (group size is of 3 students. However, if project complexity demands a maximum group size of 4 students, the committee should be convinced about such complexity and scope of the work) shall take a project in the beginning of the (B.E. first Term) seventh term in consultation with the guide and the project must be completed in the (B.E. Second Term) eighth term.

2. The project proposal must be submitted in the institute in the beginning of the (B.E. first Term) seventh term. While submitting project proposal care is to be taken that project will be completed within the available time of two term i.e 2 Hrs per week for (B.E. first Term) seventh term and 4 Hrs per week for (B.E. Second Term) eighth semester (total time become 12*2 + 12*4 = 72 Hrs per project partner). The final title of the project work should be submitted at the beginning of the (B.E. Second Term) eighth semester. .

3. Project title should be precise and clear. Selection and approval of topic:
   Topic should be related to real life or commercial application in the field of Information Technology

   OR

   Investigation of the latest development in a specific field of Information Technology

   OR

   Commercial and Interdisciplinary projects should be encouraged. The examination will be conducted independently in respective departments.

4. The group should maintain a logbook of activities. It should have entries related to the work done, problems faced, solution evolved etc., duly signed by guide.
5. The group is expected to complete details system/problem definition, analysis, design, etc. in (B.E. first Term) seventh term, as a part of term work in the form of a joint report. Project report must be submitted in the prescribed format only. No variation in the format will be accepted.

6. One guide will be assigned at the most three project groups.
7. The guides should regularly monitor the progress of the project work.
8. Assessment of the project for award of term work marks shall be done by the guide and a departmental committee (consisting of minimum two teachers with experience more than three years) as per the guidelines given in the following table.

A) ASSESSMENT OF PROJECT I TERMWORK B.E. FIRST TERM

NAME OF THE PROJECT: _____
NAME OF THE GUIDE: _____

Sr No	Exam Seat No	Name Of Student Marks	Assessment by guide (70%)					Assessment by Departmental committee (30%)			Grand Total	Out of 25 Marks
			Literature survey	Topic Selection	Docum-entation	Attendance	Total	Evaluation (10%)	Pres-ntaion (20%)	Total		
			10	05	15	05	35	05	10	15	50	25

Sign of Guide Sign. of Committee Members Sign. of H. O. D.

9. The guide should be internal examiner for oral examination (If experience is greater than three years).
10. The external examiner should be from the related area of the concerned project. He should have minimum of five years of experience at degree level / industry.
11. The evaluations at final oral examination should be done jointly by the internal and external examiners.

NORTH MAHARASHTRA UNIVERSITY, JALGAON

BE (Information Technology)
(w.e.f. 2008-09)

TERM – II

Elective – II
Artificial Intelligence and Neural Networks

Teaching Scheme:
Lectures: 4 Hrs./ Week
Practical: 2 Hrs./ Week

Examination Scheme:
Theory Paper: 100 Marks (03 Hrs.)
Term Work: 25
Oral: 25

Unit – I **(10 Hrs. 20 Marks)**

Introduction to Artificial Intelligence:
Definition, AI Problems, AI Technique ,Turing test, Problem as a state space search, production system, water jug problem, Problem characteristics, breadth first search, depth first search, Properties of internal Representation, Heuristic search techniques, Best first search, OR graph, AND-OR graph , A* and AO* Algorithms, Means and ends analysis.

Unit – II **(10 Hrs. 20 Marks)**

Knowledge Representation using Predicate Logic:
Predicate calculus, Predicates and Arguments, ISA hierarchy, Frame notation, Resolution,
Knowledge Representation using Non-monotonic Logic:
TMS (Truth Maintenance System), Knowledge representation, Semantic Net, Frames, Conceptual dependency, Script.

Unit – III **(10 Hrs. 20 Marks)**

Planning:
Types of planning, Block world, strips, Implementation using goal stack, Nonlinear planning with goal stacks, Hierarchical planning, List commitment strategy.
Perception:
Robot architecture, Vision, Representing and recognizing scenes, Constraint determination, Trihedral and Nontrihedral figures labeling, Waltz algorithm.

Unit – IV **(10 Hrs. 20 Marks)**

Introduction to Neural Network:
Biological Neuron, Artificial Neuron, Characteristics of Neural Network, Neural Network Architectures, Learning in Neural Networks, Various learning Methods and Learning Rules, Single layer Perceptron , Applications of Neural Networks for Pattern Recognition, Classification and Clustering.

Unit – V **(10 Hrs. 20 Marks)**

Multilayer and Recurrent Neural Network:
Multilayer Perceptron: - Introduction, different activation functions, Error Back Propagation Algorithm, Introduction and working of counter propagation network .
Introduction to Hopfield/Recurrent Networks, Associative and Bidirectional Associative Memory.

Reference Books:

1. Elaine Rich, K. Knight, “Artificial Intelligence". TMH.
2. Eugene Charniak, Drew McDermott, "Introduction to Artificial Intelligence".
3. J.M.Zurada, “Introduction to Artificial Neural Networks”, Jaico Publishing House.
5. Robert J. Schalkoff, “Artificial Neural Networks”, McGraw-Hill
6. Philip D.Wasserman “Neural Computing:- theory and practice”.
7. Eugene Charniak, Drew McDermott, "Introduction to Artificial Intelligence".

Term Work:

1. Design and Implement Water Jug Problem.
2. Implementation of Unification Algorithm.

3. Implementation of Dynamic database.
4. Implementation of Waltz algorithm.
5. Implementation of single perceptron training algorithm.
6. Application development using Neural Network.
7. Development of Intelligent Perception System.

Any five lab assignments should be framed by concern staff member based on above list.

NORTH MAHARASHTRA UNIVERSITY, JALGAON

BE (Computer Engineering / Information Technology)
(w.e.f. 2008-09)

TERM – II

Elective – II
Mobile Network

Teaching Scheme:
Lectures: 4 Hrs./ Week
Practical: 2 Hrs./ Week

Examination Scheme:
Theory Paper: 100 Marks (03 Hrs.)
Term Work: 25
Oral: 25

Unit – I **(10 Hrs. 20 Marks)**

Introduction – PCS Architecture, Cellular Telephony, Cordless Telephony and Low-tier PCS, Third Generation wireless system

Mobility Management – Handoff, Inter - BS handoff, Intersystem handoff, Roaming management, Roaming management under SS7 and Roaming management for CT2.

Handoff Management – Detection and Assignments, Handoff detection, Strategies for handoff detection, Mobile controlled handoff, Network controlled handoff, Mobile assisted handoff, Handoff failure, Channel assignment, Non- prioritized scheme and Reserved channel scheme, Queuing priority scheme, Sub rating scheme, Implementation issues, Hard handoff – MCHO link transfer, MAHO/NCHO link transfer, Sub rating MCHO link transfer, Soft handoff – adding new BS, dropping a BS.

Unit – II **(10 Hrs. 20 Marks)**

GSM Overview – GSM Architecture, location tracking and call setup, Security, Data Services – HSCSD, GPRS, Unstructured supplementary service data.
GSM Network Signaling – GSM MAP service frame work, MAP protocol machine, MAP dialogue.
GSM Mobility management – GSM location update, Mobility databases, Failure restoration, VLR Identification algorithm, VLR Overflow control.

Unit – III **(10 Hrs. 20 Marks)**

GSM short message service – SMS architecture, SMS protocol hierarchy, Mobile originated messaging, Mobile terminated Messaging.
International Roaming for GSM – International GSM call setup, Reducing the International call delivery cost
GSM Operations, Administration, and Maintenance – Call recording functions, Performance Measurement and Management, Subscriber and Service data Management.
Mobile number portability – Fixed network number portability, Number portability for Mobile networks, Mobile number portability mechanism.

Unit – IV **(10 Hrs. 20 Marks)**

VoIP Service for mobile networks – GSM on the Net, iGSM wireless VoIP solution, iGSM procedures and Message flows.

General Packet Radio Services – Architecture, Network nodes, Interfaces, Procedures, Billing, Evolving from GSM to GPRS.

Unit – V **(10 Hrs. 20 Marks)**

Wireless Application Protocol – WAP Model, WAP Gateway, WAP Protocol – WDP, WTLS, WTP, WSP, WAE, Mobile station Application execution environment.

Third Generation Mobile Services – Paradigm shifts in 3G Systems, W-CDMA, cdma 2000, Improvements on core network, Quality of service in 3G, Wireless Operating System for 3G Handset.

Paging Systems – Paging Network Architecture, User Access Interface – Telocator Alphanumeric Input Protocol (TAP), Telocator Message Entry Protocol (TME), Intersystem Interface.

Wireless Local Loop – WLL Architecture, WLL technologies.

Reference Books:

1. Yi-Bing Lin and Imrich Chlamtac "Wireless and Mobile Network Architecture", Wiley Publication.
2. Kasera Sumit, Narang Nishit, "3G Networks: Architecture, Protocols and Procedures", TMH

Term Work:

1. Setting up wireless network with and without infrastructure support.
2. Configuring Access Point with bridging mode (Point to Point and Point to Multi Point).
3. Configuring Routing between wired and wireless Networks.
4. Configuring Security in wireless network with and without infrastructure support.
5. At least 3 lab assignments based on above syllabus using any network simulator such as NS2, OPNET, OMNET etc.

Concerned staff members should suitably frame the term work (at least 6) based on above syllabus. Oral will be conducted based on the above syllabus and the term work submitted in the form of journal.

NORTH MAHARASHTRA UNIVERSITY, JALGAON

BE (Information Technology)
(w.e.f. 2008-09)

TERM – II

Elective – II
Information Retrieval

Teaching Scheme:
Lectures: 4 Hrs./ Week
Practical: 2 Hrs./ Week

Examination Scheme:
Theory Paper: 100 Marks (03 Hrs.)
Term Work: 25
Oral: 25

Unit – I **(10 Hrs. 20 Marks)**

Background: traditional methods, classification systems, classification of documents, cataloguing, types of catalogues, indexing, types of collections, user requirements

Automatic text analysis: Introduction, Generating document representatives – conflation, Indexing, Index term weighting, Probabilistic indexing, Discrimination and/or representation, Automatic keyword classification, Normalization

Unit – II **(10 Hrs. 20 Marks)**

Automatic classification: Introduction, Measures of association, Classification methods, The cluster hypothesis, The use of clustering in information retrieval, Single-link, The appropriateness of stratified hierarchic cluster methods, Single-link and the minimum spanning tree, Implication of classification methods

Unit – III **(10 Hrs. 20 Marks)**

Search strategies: Introduction, Boolean search, Matching functions, Serial search, Cluster

representatives, Cluster-based retrieval, Interactive search formulation, Feedback

Unit – IV **(10 Hrs. 20 Marks)**

Retrieval: user requirements, performance of information systems, manual and automatic methods compared, Retrieval of relevant information in a world-wide web environment, Information retrieval on WWW, advances in searching

Unit – V **(10 Hrs. 20 Marks)**

Retrieval Strategies: Boolean retrieval, Vector space retrieval, Probabilistic retrieval

Reference Books:

1. Korfhage, R.R. "Information Storage and Retrieval", John Wiley & Sons
2. Kowalski, G. "Information retrieval systems: theory and implementation", Kluwer
3. Charles T. Meadow "Text Information Retrieval Systems", Academic Press
4. Salton, G. and McGill, M.J. "Introduction to modern information retrieval", McGraw-Hill
5. Frakes and Baeza-Yates, "Information Retrieval: Data Structures and Algorithms" Prentice-Hall

Term Work:

It should contain at least 6 lab assignments covering the above syllabus.

NORTH MAHARASHTRA UNIVERSITY, JALGAON

BE (COMPUTER ENGINEERING/IT)
(w.e.f. 2008-09)

TERM – II

Data Warehousing and Mining

Teaching Scheme:
Lectures: 4 Hrs./ Week
Practical: 2 Hrs./ Week

Examination Scheme:
Theory Paper: 100 Marks (03 Hrs.)
Term Work: 25
Oral: 25

Unit – I **(10 Hrs. 20 Marks)**

Evolution of database technology, What is data mining?, Data Mining Applications, Steps in Knowledge Discovery, Architecture of typical data mining System, Data mining- On What kind of data, Data mining Functionalities, Classification of data mining systems, Major Issues in Data Mining.

What is Data Warehouse? Difference between Operational Database systems and Data Warehouse (OLTP and OLAP), Why Separate Data Warehouse?

A Multidimensional Data Model, Schemas for Multidimensional Databases: Stars, Snowflakes, and Fact Constellations. Measures, Concept Hierarchies, OLAP Operations in the Multidimensional Data Model.

Unit – II **(10 Hrs. 20 Marks)**

Data Warehouse Architecture, Process of Data Warehouse design, A Three tier Data Warehouse Architecture., Types Of OLAP servers.

Data Preprocessing: Why Preprocess Data? Data Cleaning Techniques, Data Integration and Transformation, Data Reduction Techniques, Discretization and Concept Hierarchy Generation for numeric and categorical data.

Data mining Primitives, A Data Mining Query Language.

Unit – III **(10 Hrs. 20 Marks)**

Concept Description: What is Concept Description? Data Generalization and Summarization-Based Characterization, Attribute Oriented Induction, Analytical Characterization: Attribute Relevance Analysis, Methods, Mining Descriptive Statistical Measures in Large Databases.

Mining Association Rules: Association Rule Mining, Market Basket Analysis, Association Rule classification, Mining Single-Dimensional Boolean Association Rules from Transactional Databases,

The Apriori Algorithm, Mining Multilevel Association Rules, Constraint-Based Association Mining.

Unit – IV **(10 Hrs. 20 Marks)**

Classification and Prediction: What is Classification and Prediction? Data Classification Process, Issues Regarding Classification and Prediction., Classification by Decision Tree Induction, Bayesian Classification, , Classification by Back propagation, A Multilayer Feed Forward Neural Network, Classification Based on Association Rule Mining, Other Classification Methods

Cluster Analysis: What is Cluster Analysis? Types of Data in Cluster Analysis, A Categorization of Clustering Methods, Partitioning Methods, Hierarchical Methods, Density Based Methods, Grid Based Methods, Model Based Clustering Methods.

Unit – V **(10 Hrs. 20 Marks)**

Cluster Analysis: What is Cluster Analysis? Types of Data in Cluster Analysis, A Categorization of Clustering Methods, Partitioning Methods, Hierarchical Methods, Density Based Methods, Grid Based Methods, Model Based Clustering Methods

Mining Complex Types Of Data: Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Mining Multimedia Databases, Mining Text Databases, Mining the World Wide Web.

Reference Books:

1. Han and Kamber, “Data Mining: Concepts and Techniques”, Morgan Kaufmann Publishers
2. Alex and Berson, “Data warehousing, Data Mining and OLAP”, TATA McGraw Hill

Term Work:

1. Develop a application to construct a multidimensional data model (Star, Snowflake or Fact constellations)
2. Develop a application to perform OLAP operations.
3. Develop a application to implement data preprocessing techniques.
4. Develop a application to implement data integration techniques.
5. Develop a application to implement data generalization and summarization techniques
6. Develop a application to extract association mining rules.
7. Develop a application for classification of data.
8. Develop a application for implementing one of the clustering technique.
9. Study of commercial data mining tools.

Any 6 laboratory assignments should be framed by concern staff member based on above list.

NORTH MAHARASHTRA UNIVERSITY, JALGAON

BE (COMPUTER ENGINEERING / IT)
(w.e.f. 2008-09)

TERM – II

Software Metrics and Quality Assurance

Teaching Scheme:
Lectures: 4 Hrs./ Week
Practical: 2 Hrs./ Week

Examination Scheme:
Theory Paper: 100 Marks (03 Hrs.)
Term Work: 25
Oral: 25

Unit – I **(10 Hrs. 20 Marks)**

Software Measurements: Measurement in Software Engineering, Scope of Software Matrices, The representational theory of measurements, Measurement and Models, Measurements Scales and scale types, Meaningfulness in measurement, Classifying software measures, Applying the framework, Software measurement validation.

Unit – II **(10 Hrs. 20 Marks)**

Measuring internal product attributes: Size- Aspects of software size, Length, Reuse, Functionality, Complexity.

Measuring internal product attributes: Structure- Types of structural measures, Control-flow structure, Modularity and information flow attributes, Data structure, Difficulties with general "complexity" measures.

Measuring internal product attributes: Modeling software quality, Measuring aspects of quality.

Unit – III **(10 Hrs. 20 Marks)**

Software Reliability: Basics of reliability theory, software reliability problem, parametric reliability growth models, predictive accuracy, importance of operational environment.

Good estimates, cost estimation: problems and approaches, models of effort and cost, problem with existing modeling methods, dealing with problems of current estimation methods, implication for process predictions.

Unit – IV **(10 Hrs. 20 Marks)**

Software documentation, Standards, Practices, Conventions and metrics, The software inspection process, The walkthrough process, Audit process, Document verification, The ISO 9000 Quality Standards, Comparison of the ISO 9000 model with SEI's CMM.

Unit – V **(10 Hrs. 20 Marks)**

Cleanroom Software Engineering: The cleanroom approach, Functional Specification, Cleanroom design, Cleanroom testing.

Reengineering: Business process reengineering, Software reengineering, Reverse reengineering, Reconstructing, Forward engineering, The economics of reengineering.

Reference Books:

1. Flanton, Pfleeger, "Software Metrics- A Rigorous and Practical Approach", Thompson Learning
2. Mordechai Ben-menachem/Garry S.Marliss, "Software Quality", Thompson Learning
3. Roger S. Pressman, "Software Engineering- A Practitioner's Approach", TMH
4. Swapna Kishore and Rajesh Naik, "ISO 9001:2000 for Software Organizations", TMH

Term Work:

Concerned staff members should suitably frame the term work at least 5 assignments based on above syllabus.

NORTH MAHARASHTRA UNIVERSITY, JALGAON

BE (Information Technology)
(w.e.f. 2008-09)

TERM – II

Internet Security

Teaching Scheme:
Lectures: 4 Hrs./ Week
Practical: 2 Hrs./ Week

Examination Scheme:
Theory Paper: 100 Marks (03 Hrs.)
Term Work: 25

Unit – I **(10 Hrs. 20 Marks)**

Security Basics – Define information security as process. Anti virus Software, Accesses controls, smart cards, biometrics, intrusion detection, policy management Encryption, physical security mechanism. Type of attacks – assess attacks modification attacks, Denial of services attacks repudiation attacks.

Unit – II **(10 Hrs. 20 Marks)**

Hackers techniques – Hackers motivations, historical hacking techniques, advanced techniques. Identification – Malicious code, Method of untargeted hackers, Methods of targeted hacker. Information security services, confidentiality, integrity, availability, accountability, Understanding of laws of India and U.S. Understanding privacy, civil issues.

Unit – III **(10 Hrs. 20 Marks)**

Policy- importance various policies, creating policy, Deploy policy, using effectively policy. Management Risk – risk, identification of risk , measure risk

Information security Process. Conduct an assessment, develop policy, implementation of security conduct training and audit.

Unit – IV **(10 Hrs. 20 Marks)**

Information security, Best practices administrative, technical security university, make use of ISO 17799. Firewalls – types configuration, Rule set. Encryption- private key, public key, digital signature, understand key management, trust in system, Intrusion detection.

Unit – V **(10 Hrs. 20 Marks)**

Unix security issues, setup a system. User management system management, Windows 2000/windows2003 server issues set up system, manage users ,manage the system, use active directory.

Reference Books:

1. Roberta Bragg, Mark Rhodes, Keith Strassberg, “Network Security- The complete Reference”, TMH
2. Eric Maiwald , “Network security a Beginner’s guide”
3. Basics of n/w security, firewalls and VPN , PHI
4. Tanenbaum, “Computer Networks”, PHI

Term Work:

Any five lab assignments should be framed by concern staff member based on above syllabus.

NORTH MAHARASHTRA UNIVERSITY, JALGAON

BE (Information Technology)
(w.e.f. 2008-09)

TERM – II

Industrial Visit / Case Study

Teaching Scheme: -

Examination Scheme:
Term Work: 25

EDUCATION TOUR / TECHNICAL VISITS / CASE STUDY AND ITS EVALUATION

1. During (B.E. First Term / Second Term) seventh and / or eighth terms or during vacation between (B.E. First Term / Second Term) seventh and eighth terms, every student; shall visit minimum two industries, factories arranged by colleges and accompanied by teachers. There shall be at least one teacher for a group of 20 students and at least one non-teaching staff accompanied with the students.

2. The colleges should obtain appropriate certificates of visit from the concerned organizations just after the visits.

3. Students should submit written report about the visits individually at the end of (B.E. Second Term) eighth term.

4. The report should contain information about the following points:

   (a) The organization - activities of organization and administrative setup technical personnel and their main duties.
   (b) The project / industry brief description with sketches and salient technical information.
   (c) The work / processes observed with specification of materials, products, equipments etc. and role of engineers in that organization.
   (d) Suggestions (if any) for improvement in the working of those organizations.

5. The evaluation of the report of technical visits will be made by panel of two teachers appointed by principal based on following points:

   (a) Coverage aspect: All above points should be covered.
   (b) Detailed observations: System / Process / Product explained with data, diagram specifications.
   (c) Quality of presentation: Report should be very objective and should consist of clear and systematic organization of topics and information.
   (d) Viva - voce: A viva -voce shall be conducted on the technical visit report by the teachers to assess the specific knowledge gained by the students for technical applications.

6. The case study should include the study problem in Computer Engineering branch.

NORTH MAHARASHTRA UNIVERSITY, JALGAON

BE (Information Technology)
(w.e.f. 2008-09)

TERM – II

Project - II

Teaching Scheme:	**Examination Scheme:**
Practical: 6 Hrs./ Week	Term Work: 100
	Oral: 50

1. The Project group in (B.E. first Term) seventh term will continue the project work in (B.E. Second Term) eighth term and complete project.
2. The group should maintain a logbook of activities. It should have entries related to the work done, problems faced, solution evolved etc., duly signed by guide.
3. The guides should regularly monitor the progress of the project work.
4. The project work along with project report should be submitted as part of term work in (B.E. Second Term) eighth term on or before the last day of the (B.E. Second Term) eighth term.
5. Project report must be submitted in the prescribed format only. No variation in the format will be accepted.
6. Assessment of the project for award of TW marks shall be done by the guide and a departmental committee (consisting of minimum two teachers with experience more than three years) as per the guidelines given in the following table.

B) ASSESSMENT OF PROJECT II TERMWORK (B.E. SECOND TERM)

NAME OF THE PROJECT: _____
NAME OF THE GUIDE: _____

Sr. No	Exam. Seat No	Name Of Students Marks	Assessment by guide (70%)						Assessment by department (30%)			Grand Total
			Fabrication /software / actual work	Execution of project	Project report	Scope/ Cost / Utility	Attende-nece	Total	Evaluation (10%)	Prese-ntaion (20%)	Total	
			20	10	20	10	10	70	10	20	30	100

Sign of Guide Sign. of Committee Members Sign. of H. O. D.

7. The guide should be internal examiner for oral examination (If experience is greater than three years).
8. The external examiner should be from the related area of the concerned project. He should have minimum of five years of experience at degree level / industry.
9. The evaluation at final oral examination should be done jointly by the internal and external examiners.
10. The Project work should be kept in department for one academic year after University Examination.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
STRUCTURE OF TEACHING AND EVALUATION
S.E. (MECHANICAL ENGINEERING)

FIRST TERM

W.E.F. 2006-07

Sr. No.	Subject	Teaching Scheme Hours/week			Examination Scheme				
		Lectures	Tutorial	Practical	Paper Duration Hours	Paper	TW	PR	OR
1	***Engineering Mathematics-III	4	--	--	3	100	--	--	--
2	***Strength of Materials	4	--	--	3	100	25	--	--
3	***Material Science	4	--	2	3	100	25	--	25
4	Manufacturing Engineering-I	4	--	--	3	100	--	--	--
5	Applied Thermodynamics	4	--	2	**3**	100	25	--	25
6	Machine Drawing	--	--	2	--	--	25	--	--
7	**Computer Graphics	--	--	2	--	--	25	25	--
8	***Workshop Practice -III	--	--	2	--	--	50	--	--
	Total	**20**	**--**	**10**		**500**	**175**	**25**	**50**
	Grand Total	**30**			**750**				

** Common with Automobile Engineering
******* Common with Production Engineering and Automobile Engineering

SECOND TERM

Sr. No.	Subject	Teaching Scheme Hours/week			Examination Scheme				
		Lectures	Tutorial	Practical	Paper Duration Hours	Paper	TW	PR	OR
1	**Theory of Machines	4	--	2	3	100	25	--	25
2	***Industrial Engineering	4	--	--	3	100	25	--	--
3	***Fluid Mechanics	4	--	2	3	100	25	--	25
4	***Electrical Machines and Industrial Electronics	4	--	2	3	100	25	--	--
5	Manufacturing Engineering-II	4	--	--	3	100	25	--	--
6	***Workshop Practice-IV	--	--	4	--	--	25	--	50
	Total	**20**	**--**	**10**		**500**	**150**	**00**	**100**
	Grand Total	**30**			**750**				

** Common with Automobile Engineering
******* Common with Production Engineering and Automobile Engineering

Engineering Mathematics-III

(Common with Production Engineering And Automobile Engineering)

Teaching Scheme
Lecture: 4 Hours/Week

Examination Scheme
Theory Paper: 100 Marks
Paper Duration: 3 Hours.

Unit: I Linear Differential Equations

Linear Differential Equations of order n, Solution of LDE with constant coefficient, method of variation of parameters, Equations reducible to linear form (with constant coefficient), Cauchy's linear equation, Legendre's linear equation. Whirling of Shafts.

(10 Hrs, 20 Marks)

UNIT: II

a) Simultaneous differential equation. Introduction to Applications to mass spring system.

b) Solution of Partial Differential Equations.

(i) One dimensional heat flow equation : $\partial u/\partial t = a^2 \partial^2 u/\partial x^2$

(ii) Laplace's equations (Two dimensional heat flow equation):

$\partial^2 u/dx^2 + \partial^2 u/dx^2 = 0$ by separating variables only. Applications of Partial Differential equations to problems of Mechanical and Allied Engineering.

(10 Hrs, 20 Marks)

Unit: III Lap lace transforms

Laplace Transform (LT): Defination, Exisistance, Laplace transforms of elementary/slandered functions, Theorems & Properties of LT(without proof), Inverse LT, Solution of differential equations using LT

(10 Hrs, 20 Marks)

Unit: IV Statistics

Introduction to Mean, Mode, Median, Standard deviation.
Variance, Coefficient of variation, Moments, Skewness and Kurtosis.
Correlation and Regression, Chi-square tests.

(10 Hrs, 20 Marks)

UNIT: V a) Probability

Revision of probability theorems. Probability distribution, Binomial, Poission & Normal distributions.

b) Fourier Transform (FT)

Fourier Integral theorem, Sine & Cosine Integrals. Fourier Transforms, Fourier Cosine Transforms, Fourier Sine Transform and their inverse.

(10 Hrs, 20 Marks)

* No question is to be set on introductory part.

Text Books

1. P.N. Wartikar & J.N. Wartikar A text of applied Mathematics (Volume –III), Pune Vidyarthi Griha Prakashan, Pune.
2. B.S. Grewal Higher Engineering Mathematics, Khanna Publication, New Delhi.
3. H.K. Das, Advance Engineering Mathematics S. Chand & Co. New Delhi.

Reference Books

1 Erwin Kreyszig, Advanced Engineering Mathematics (7^{th} edition) Wiley Eastern Ltd., Bombay.

2. C.R. Wylie, Advanced Engineering Mathematics McGraw Hill Publications, New Delhi.

3 Peter V.O'Neil, Advanced Engineering Mathematics (5^{th} edition) Thomson Brook Cole, Singapore.

4 Kishore S, Trivedi, Probability & Statistics with reliability, queuing & Computer Science application Prentice Hall of India Pvt. Ltd., New Delhi.

STRENGTH OF MATERIALS

(Common with Production Engineering And Automobile Engineering)

Teaching Scheme
Lecture: 4 Hours/Week

Examination Scheme
Theory Paper: 100 Marks
Term Work: 25 Marks
Paper Duration: 3 Hours.

UNIT: I SIMPLE STRESSES AND STRAIN

Concept of stress and strain (linear, lateral, shear and volumetric), Hook's law, Poisson's ratio, modulus of elasticity, modulus of rigidity, stress-strain diagram for ductile and brittle materials, factor of safety and working stress, concept of 3-D stress state, bulk modulus, inter relation between elastic modulus.

Axial force diagram, stress-strain, deformations in determinate homogeneous and composite bars of following types.

1) Prismatic
2) Linearly varying
3) Stepped section under concentrated loads and self-weights.

Axial stresses and strain in determinate members –axial stress, strain and deformation in following indeterminate, homogeneous and composite bars.

1) Prismatic
2) Linearly varying
4) Stepped section under concentrated loads, self-weights and temperature changes.

(9 Hrs, 20 Marks)

UNIT: II PRINCIPLE STRESSES AND STRAINS

Normal and shear stress on any oblique plane, concept of principle plane, derivation of expression for principle stresses and planes and plane of max. Shear stress, position of principle plane and plane of max. Shear, graphical solution using Mohr's circle of stresses, combined effect of shear and bending in beams.

Strain energy and impact-concept of stain energy, derivation and use of expression for deformation of axially loaded members under gradual, sudden and impact loads. Strain energy due to self-weight.
Theories of failure- Maximum stress, maximum strain, maximum shear stress, maximum total strain energy.

(9 Hrs, 20 Marks)

UNIT: III SHEAR FORCE AND BENDING MOMENT DIAGRAM

Concept and definition of shear force and bending moment in determinant beams due to concentrated loads, UDL, UVL and couple.

Relation between SF, BM and intensity of loading, construction of shear force and bending moment diagram for cantilever, simple and compound beams, defining critical and maximum value and position of point of contra flexure.

Construction of BMD and load diagram from SFD, Construction of load diagram and SFD from BMD.

Slope and deflection for member in bending relation between moment and slope, slope and deflection of determinate beams, double integration method (Macaulay method) Derivation of formulae for slopes and deflections for standard cases, moment area method, conjugate beam method.

(9 Hrs, 20 Marks)

UNIT: IV BENDING STRESSES

Theory of simple bending, assumptions in bending theory, Derivation of flexural formula, Area center and moment of inertia of common cross section (regular section, T- section, channel section, I-section) with respect to centroidal and parallel axis, bending stress distribution diagram, moment of resistance and section modulus calculations.

Direct and bending stresses in short column and other structural component, Stress distribution diagram, axial load for single eccentric self weight combined with lateral loads, concept of core section, middle third rule.

Shear stresses: - Concept, derivation of shear stress distribution formula, shear stress distribution diagram for common cross section, maximum and average shear stresses, shear connection between flange and web.

(9 Hrs, 20 Marks)

UNIT: V TORSION IN CIRCULAR SHAFTS

Stresses, strains and deformations in solid and hollow shafts, homogeneous and composite circular cross-sections subjected to torsion. Derivation of torsion equation. Stress due to combined torsion, bending and axial force on shafts.

Thin and thick walled pressure vessels: - Stress, strain and deformation in thin wall seamless cylindrical and spherical vessel due to internal fluid pressure, change in volume, constants, effects of additional compressible and incompressible fluid injected under pressure, use of I.S.code.

(9 Hrs, 20 Marks)

REFERENCE BOOKS

1) Timoshenko, Mechanics of Materials, CBS Publisher &Distributor
2) Ramamruthum, Strengths of Materials, Dhanpat Rai Publication
3) Junnarkar & Advi, Mechanics of Structure, Charorar Publication House, ANAND
4) Bear &Johnson, Mechanics of Materials
5) Shigley J.E., Mechanical Engineering Design

MATERIAL SCIENCE

(Common with Production Engineering And Automobile Engineering)

Teaching Scheme	Examination Scheme
Lecture: 4 hrs/week	Theory Paper: 100 Marks
Practical: 2-hrs/week	Term work: 25 Marks
	Oral: 25 Marks
	Paper Duration: 3 hrs.

UNIT-I Nature of Engineering Materials

Nature of metals and alloys, structure-property relationship, atomic structure, atomic bonds, atomic arrangements in materials, crystal structure of metals, development of grain structure, elastic and plastic deformation of single crystals, dislocation theory of slippage, strain hardening or work hardening, plastic deformation in polycrystalline metals, ductile and brittle fractures, cold working, recrystallization and hot working.

Non-metallic materials: Plastic elastomers, ceramics and composites, property and structures. Application of these materials in various engineering fields.

(9 Hrs, 20 Marks)

UNIT-II Mechanical Properties and Testing

Static property, tensile test, engineering and true stress, true strain curves, evaluation of properties and significance of test, typical engineering stress-strain diagrams, compression test, cupping test on sheet metals. Hardness test- Brinell, Poldi, Vickers, Rockwell superficial, Micro hardness test, Sceleroscope, Durometer, Mohr's test, relationship among the various hardness test, relationship of hardness to tensile strength, Dynamic properties, Impact tests, Charpy and Izod, Fatigue

test and the endurance limit, temperature effects, creep test, machinability, formability and weldability.

Non-destructive testing: Advantages and limitations of destructive and non-destructive testing, liquid penetrant, magnetic particle inspection, and ultrasonic test, radiography and eddy current test.

(9 Hrs, 20 Marks)

UNIT-III Equilibrium Diagrams

Equilibrium Diagrams: Introduction, alloys, alloy types, phases, Hume Rothery's rule of solid solubility, Gibb's phase rule, Polymorphism, cooling curves, plotting of equilibrium diagrams, utilization of diagrams, solidification of alloy, types of equilibrium diagram, Isomorphs, eutectic and partial eutectic and layer type, Non-equilibrium cooling and it's effects.

Strengthening mechanisms: Refinement of grain size, solid solution, hardening, desperation hardening, age hardening, martensitic transformation.

(9 Hrs, 20 Marks)

UNIT-IV Powder Metallurgy and Pyrometry

Powder Metallurgy: Introduction Basic process, power manufacturing, powder testing and evaluation, powder mixing and blending, compacting, sintering, hot isostatic pressing, secondary operations, applications, merits and demerits.

Pyrometry: principle, operation and uses of various pyrometers, thermocouples, thermocouple materials, resistance pyrometer, disappearing filament pyrometer, radiant pyrometer.

(9 Hrs, 20 Marks)

UNIT-V Corrosion and Prevention

Corrosion and Prevention: Cost of corrosion, dry corrosion, wet corrosion, electrochemical mechanism, corrosion tendency and electrode potential polymerization, corrosion rates, passivity, forms of corrosion, galvanic pitting, crevice and intergranular corrosion, stress corrosion etc. Prevention of corrosion: selection of materials, modification of environment, design of components, cathodic protection, coating, anodizing, Inhibitors

Methods of surface improvement, surface treatment, coating, painting, paint application, methods- spray painting, electrostatic deposition, electro- coating, hot dip coating, chemical conversions coatings, electroplating, anodizing, electroless plating, vaporized metal coating, vacuum metallizing, spurting, chemical vapuor deposition.

(9 Hrs, 20 Marks)

Term Work:

1. Tensile test on mild steel and aluminum test pieces.
2. Rockwell and Rockwell superficial test on different samples with different scales.
3. Brinell hardness test on steel, cast iron, brass and aluminum alloys.
4. Vicker's hardness test on mild steel, hardened steel and cast iron.
5. Poldi hardness test on samples of three different metals.
6. Erichson cupping test.
7. Non-destructive tests: Dye penetrant test.
8. Magnetic particle testing or eddy current test.
9. Izod and charpy impact test.
10. Effect of cold working on hardness of minimum two materials.
11. Testing of bulk properties such as flow rate, apparent density and tap density of metal powder.

MANUFACTURING ENGINEERING-I

Teaching Scheme
Lecture: 4 Hours/Week

Examination Scheme
Theory Paper: 100 Marks
Paper Duration: 3 Hours.

UNIT: I CASTING

Molding Sand: Types and Properties, Patterns: Types, Allowances, Cores: Types, Chaplets, Moulding Box, Principle of Operation, sketch, applications of Sand mould casting, Die Casting, Permanent mould Casting, Centrifugal Casting, Investment Casting, Continuous Casting. Defects in Casting, Cleaning and finishing of casting, Inspection and testing of casting.

(9 Hrs, 20 Marks)

UNIT: II MECHANICAL WORKING OF METALS

Re-crystallization temperature, Hot Working and Cold Working of Metals, Principle of Operation, Sketch, Advantages, limitations and applications of: Rolling-rods, Wires, Tubes; Sheet Metal Working-Shearing, Piercing, Blanking, Drawing, Bending; Forging-Open Die, Closed Die, Drop Forging, Press Forging, Machine Forging, Cold Forging.

(9 Hrs, 20 Marks)

UNIT: III JOINING PROCESSES

Welding, Classification of Welding Processes, Principle of Operation, Sketch, Advantages, limitations and applications of: Forge Welding, Friction Welding, Thermit Welding, Spot Welding, Seam Welding, Projection Welding, Arc Welding, Difference between AC and DC Welding, Shielded Metal Arc Welding, Gas Welding: Flames and Techniques, Tungsten Inert Gas Welding, Metal Inert Gas Welding, Submerged Arc Welding, Brazing, Soldering, Welding Defects.

(9 Hrs, 20 Marks)

UNIT: IV GEAR AND THREAD MANUFACTURING

Gear Manufacturing Processes, Form Cutter Method, Gear Generating Method, Gear Cutting by Single Point Cutting Tool, Gear Shaping, Gear Manufacturing by –Casting, Roll Forming, Extrusion, Cold Drawing, Stamping, Hot Forging, Gear Finishing Operations-Gear Shaving, Gear Burnishing, Gear Grinding. Thread Manufacturing Methods-Casting, Chasing, Thread Rolling and Die Threading and Tapping, Thread Milling, Thread Grinding.

UNIT: V MACHINING PROCESSES & CAPSTAN AND TURRET LATHE

Machining Processes – Turning, shaping, planning, boring, drilling, milling

Capstan & Turret Lathe --Introduction, Difference between Engineering Lathe, Capstan and Turret Lathe, Indexing mechanisms, Bar feeding mechanisms, Work holding devices, tool holding devices, Automates-single and multi spindle automates.

(9 Hrs, 20 Marks)

Reference Books

1 Bawa, Manufacturing Technology- I (Ascent Series),Tata McGraw Hill, New Delhi

2 P.C. Sharma, A text Book of Production Technology - S. Chand Publication.

3 K. C. Jain Production Engineering – Tata McGraw Hill,New Delhi

4 E. Paul De Garmo, Materials & Processes in Manufacturing – Prentice Hall of India

5 Hajara Choudhari, Bose S.K. Elements of Workshop Technology Volume I&II Asia Publishing House

APPLIED THERMODYNAMICS

Teaching Scheme
Lecture: 4 Hours/Week
Practical: 2 Hours/ Week

Examination Scheme
Theory Paper: 100 Marks
Term Work: 25 Marks
Oral: 25 Marks
Paper Duration: 3 Hours.

UNIT: I FUELS AND COMBUSTION

Types of fuels, Ultimate and proximate analysis of fuel, Gravimetric and volumetric analysis and their conversions, Physical law of combustion, basic combustion equations, composition of dry air, Stoichiometric air-fuel ratio, Actual air fuel relation, excess air, determination of actual quantity of air from combustion analysis, Fuel gas analysis, Orsat apparatus, Enthalpy of formation, Enthalpy of combustion, calorific values and their determination.

(9 Hrs, 20 marks)

UNIT: II STEAM GENERATORS

Classification of boilers, introduction to water tube and fire tube boiler, introduction to IBR laws, characteristics and features of high pressure boilers, Stirling, Lamount, Loeffler, benson boilers, Boiler mountings and accessories, boiler draught, natural and artificial draught, draught losses, regulation and calculation for chimney height, Condition for maximum discharge, Equivalent evaporation, boiler efficiency, Heat balance.

(9 Hrs, 20 Marks)

UNIT: III STEAM CYCLES AND CONDENSERS

Introduction to steam power plant, carnot vapour power cycle, Rankine cycle, work ratio, back work ratio, specific steam consumption. Effect of operating variables (boiler pressure, condenser pressure and super heat) on Rankine cycle, Reheat and regenerative Rankine. Introduction to condensers, Jet and Surface condensers, types of condensers, condensres vacuum and vacuum efficiency, air pumps, capacity of air extraction pumps, sources of air leakage and effect of air leakage, cooling towers.

(9 Hrs, 20 Marks)

UNIT: IV COMPRESSIBLE FLUID FLOW AND STEAM NOZZLES

Static and stagnation properties, sonic velocity, Mach number, types of nozzles, one dimensional steady isentropic flow through nozzles and diffusers, critical pressure ratio and maximum discharge, supersaturated

flow, effect of variation in back pressure on nozzle characteristics, shocks and losses, effect of friction and nozzle efficiency.

(9 Hrs, 20 Marks)

UNIT: V RECIPROCATING AIR COMPRESSORS

Introduction, uses of compressed air, classification of compressors, air compressor terminology, Constructions and workings of single cylinder, single stage, single and double acting reciprocating air compressors, indicated work done (polytropic, isothermal and isentropic) without clearance, isothermal efficiency, effect of clearance, volumetric efficiency, F.A.D., theoretical and actual indicator diagrams, methods of improving volumetric efficiency, Multistage compression: requirement, work done in multistage compression, inter cooling and after cooling, condition for maximum efficiency.

(9 Hrs, 20 Marks)

LIST OF EXPERIMENTS

Minimum eight experiments should be performed from following lists:

1. Determination of calorific value of solid/ liquid/gaseous fuel.
2. Analysis of flue gases by Orsat / PUC apparatus.
3. Study of high-pressure boilers.
4. Determination of Isothermal and Volumetric efficiency of reciprocating air compressor.
5. Study of steam nozzles.
6. Study of steam condensers and cooling towers.
7. Study of thermal power plant by actual visit.
8. Study of boiler draughts.
9. Study of Rankine cycle (five numericals based on the syllabus)
10 Study of on boiler efficiency and heat balance sheet. (Assignment on the same)

REFERENCE BOOKS

1. R. K. Rajput, Thermal Engineering, Laxmi Publication, New Delhi.
2. Domkundwar, Refrigeration & Air Conditioning, Dhanpatrai and Sons, New Delhi.
3. P.L. Ballany, Thermal Engineering, Khanna Publication, New Delhi.
4. Kumar, Vasandani Heat Engineering, Metropolitan Book Company. Pvt.Ltd. New Delhi.
5. Rudramurthy, Thermal Engineering, Tata McGraw Hill, New Delhi.
6. S.C. Gupta, Thermal Engineering, Pearson Education Pvt. Ltd. New Delhi.
7. P. K. Nag, Thermodynamics, Tata McGraw Hill, New Delhi.

Machine Drawing

Teaching Scheme	Examination Scheme
Practical: 2 Hours/Week	Term Work: 25 Marks

Term work shall consist of:

Two projects consisting of a full imperial size sheet each involving assembly drawing with a part list, overall dimensions and detailed drawing of couplings, bearings, lathe parts, screw jack, vices, valves etc.

Manufacturing tolerances, surface finish symbols and geometric tolerances should be specified so as to make it a working drawing.

Third sheet should contain all the machining symbols, tolerances, welding symbols etc.

REFERENCE BOOKS

1. N D Bhatt, Machine Drawing, Charotar Publishing Company.
2. J E Shigley & C R Mischke, Mechanical Engineering Design, 5th Edition, McGraw Hill Publications New Delhi.
3. N Sidheswar & Kannaiah, Machine Drawing, Tata McGraw Hill Publications New Delhi.

WORKSHOP PRACTICE – III

(Common with Production Engineering And Automobile Engineering)

Teaching Scheme — Examination Scheme

Practical: 2 Hours/Week — Term Work: 50 Marks

1. Jobs: -

A. CARPENTARY SHOP [4 hrs]

Preparation & Manufacturing of solid pattern involving Wood Turning from component drawing. (1 job)

B. MACHINE SHOP [8 hrs]

One composite job involving different machine operation on Lathe, Shaper, Slotter, Drilling, Milling & Grinding operations.

NOTE: Group of maximum 3 to 4 students depending upon the work involved.

C. FOUNDRY SHOP [4 hrs]

Preparation of mould of above pattern, casting from this mould. Actual weight calculation, yield & casting of item should be performed.
(1 job)

D. WELDING SHOP [4 hrs]

One job on welding (fabrication) preparing a component comprising welding joints such as shoe rack, book rack, stands for flower pots, house hold applications etc.

2. Journals and Demonstration: -

A journal containing records of following assignments based on the demonstration on machine tools (sketches and relevant description)

(i) Block Diagrams (any Two)
1. Lathe,
2. Universal Milling Machine,
3. Radial Drilling Machine,
4. Cylindrical Grinder.

(ii) Mechanisms (any Two)
1. All geared head stock of a Center Lathe,
2. Spindle arbor (assembly) drive of a Milling Machine,

3. Crank and slotted lever quick return drive of Shaping Machine,
4. Spindle assembly in a Drilling Machine.

(iii) Accessories (any Two)
1. Taper turning attachment for a Center Lathe,
2. Universal Driving Head,
3. Milling Cutter.

(iv) 1. Process planning sheet of the components of the job to be under taken.
2. Tool profile sheet for job of turning.
3. Introduction to industry.

Special grinding machines – honing, lapping, super finishing, buffing, burnishing.

NOTE

A) The candidates are required to finish the job to the following limits.
1. Lathe: - + /- 0.05 mm
2. Grinding: - + /- 0.05 mm
3. Shaper: - + /- 0.05 mm
4. Milling: - + /- 0.05 mm

B) Work Book shall include description with detailed drawing i.e. Working drawing of each job showing all dimensions, limits, finishing processes, material used, machining symbol etc.

C) Theory concered is to be taught in workshop only to every batch going to work shop for practical, during only in practical hours only.

Reference Books

1. Hajara Chauidhary Bose S. K., Element of Workshop Technology
Volume II, Asia Publishing House.
2. P.N. Rao, Production Technology Volume I & II, Tata McGraw Hill
Publication.
3. R.K. Jain, Production Technology, Khanna Publishers.
4. P.C. Sharma Production Technology, Khanna Publishers.
5. Chaprnan W.A. J., Workshop Technology, Volume II, ELBS Publishers.
6. HMT, Production Technology Tata McGraw Hill Publication.

COMPUTER GRAPHICS
(Common with Automobile Engineering)

Teaching Scheme	Examination Scheme
Practical: 2 Hours/Week	Term Work: 25 Marks
	Practical: 25 Marks

Term work shall consists of:

a) Two assignments on AutoCAD (preferably latest version).
b) Two assignments on Auto LISP (such as Design and drafting of any mechanical component through Auto LISP)

REFERENCE BOOKS

1. AutoCAD reference manual
2. Auto LISP reference manual
3. George Omura, ABCs of Auto LISP, BPB. Publication.

THEORY OF MACHINES-I

(Common with Automobile Engineering)

Teaching Scheme	Examination Scheme
Lecture: 4 Hours/Week	Theory Paper: 100 Marks
Practical: 2 Hours/ Week	Term Work: 25 Marks
	Oral: 25 Marks
	Paper Duration: 3 Hours.

UNIT: I

Fundamentals of kinematics, Types of motion, degree of freedom, Grubler's criterion, mechanisms with lower pairs, hooks joint, steering gear mechanism, straight line mechanism, Geneva mechanism ,Inversion of mechanism.

1. Velocity analysis by ICR method, relative velocity method.
2. Acceleration analysis by relative acceleration method, Coriolis acceleration. (9 Hrs, 20 Marks)

UNIT: II

1. Algebraic method of velocity & acceleration analysis.
2. Klein's construction.
3. Static force analysis.
4. Inertia force analysis of IC engine mechanism, geared system.
5. Dynamical equivalent system, compound pendulum, bifilar suspension & trifler suspension method for inertia analysis.

(9 Hrs, 20 Marks)

UNIT: III

1. Velocity & acceleration analysis by complex algebra method.
2. Velocity & acceleration by vector algebra method.

(Four bar & single slider mechanism only)

UNIT: IV

1. Friction, laws, efficiency of inclined plane, screws, clutches.
2. Friction circle and friction axis of mechanism.
3. Lubrication, system,types,proper

(9 Hrs, 20 Marks)

UNIT: V

1. Types of friction drives, open belt, cross belt, length of belt.
2. Slip. Creep, crowning of pulleys, steeped pulley.
3. Power transmitted, maximum power transmitted by belt drive.
4. Chain, types, length of chain, power transmitted.

(9 Hrs, 20 Marks)

List of Practicals:

1. To determine the mass moment of inertia of compound pendulum.
2. To determine the mass moment of inertia of bifilar/triflar suspension method.
3. To determine the slip of belt drive.
4. Velocity analysis by ICR method (2 problems)
5. Relative velocity & acceleration method (4 problems)
6. Klein's construction (4 problems)
7. Inertia force analysis of IC engine mechanism by graphical method.

Assignments: Five assignments on above topics in addition to above practicals

References:

1) P.L.Ballany Theory of Machines & Mechanism ,Khanna Publication New Delhi
2) Jagdish Lal, Theory of Machines & Mechanism

3) S.S Ratan, Theory of Machines & Mechanism,Tata McGraw Hill
4) R.S.Khurmi, Theory of Machine
5) Sadhu singh , Theory of Machine, Pearson Education
6) Thomas Bevan ,The Theory of Machine ,CBS Publication and Distributors
7) Shighley J.E, Theory of Machines,Tata McGraw Hill
8) Hannah & Stephen, Mechanics of Machines

INDUSTRIAL ENGINEERING

(Common with Production Engineering And Automobile Engineering)

Teaching Scheme	Examination Scheme
Lecture : 4Hrs/week	Paper : 100 Marks
	Paper Duration : 3Hrs
	Term Work : 25 Marks

UNIT I: -

1) Introduction to Industrial Engineering, origin and growth, contribution of Taylor, Gilberths relevance and importance in the economics & industrial development through productivity.
2) Work study
    a) Work study and productivity improvement; scope and application.
    b) Method study:-
    i) Introduction, scope and application
    ii) Select criteria for selecting assignments; record charting symbols. Flow process chart, multiple activity chart. Examine- questioning technique,. Develop motion economy, work place layout, improvement and working condition, implement and maintain
    c) Work Measurement
    i) Aims objectives scope and application
    ii) Stop watch study- equipment and procedure, rating allowance and standard time; activity sampling- principle, procedure and applications.

(9 Hrs, 20 Marks)

UNIT II: -

1) PLANT LAYOUT AND MATERIAL HANDLING

a) Criteria for plant location, site selection, types of plant layout, planning for utilities

b) Material Handling- necessity of material handling, procedure for analyzing material handling system, methods and equipment of material handling. Effect of layout and material handling system on productivity and profitability

c) Safety in material handling and factory operation

2) a) Factories act

c) Indian Boiler Act

(9 Hrs, 20 Marks)

UNIT III: -

PRODUCTION AND MATERIAL PLANNING CONTROL

a) Production Planning

1. Production and material planning as in integral and interdependent system
2. Production Planning- for casting, capacity estimation, planning scheduling and control

b) Material Planning- need and basis for material planning, planning and control of raw material. Ark- in and brought out components

c) Progress Control - introduction, step involved, bar chart, Gantt char, transmission of report and corrective action.

(9 Hrs, 20 Marks)

UNIT IV: -

Wage administration- job analysis, job description, job rating, wage survey, wage scale.

i) Job evaluation and payment of result:-

Job evaluation- necessity and principles of job evaluation, systems of job evaluation, application.

ii) PBR as a motivating factor, incentive scheme- basis of schemes, Taylor, Rowan, Halsey and Bedoux plan, incentive to indirect workers, preplanning for introduction incentive scheme.

iii) Value analysis/ engineering- concepts, procedure and steps in value analysis/engg. Scope and application

(9 Hrs, 20 Marks)

UNIT V: -

Ergonomics:

Definition and importance: historical background. Human machine systems- interfaces. Anthropometry: need, important body dimensions, data collections, statically analysis, percentile. Applied Anthropometry and work space design and seating, ergonomics and safety.

(9 Hrs, 20 Marks)

References:-

1) Maynard, Industrial Engineering. Hand book, McGraw Hill book company
2) ILO, Introduction to Work Study
3) Khanna O.P. , Industrial Engineering. and Management, Dhanpat Rai Publication, New Delhi.
4) Factory Act -1948
5) Indian Boiler Act- 1923 (Revised 1983)
6) L.C. Jhamb " A text book of Industrial Engineering", Everest Publishing House, India.

FLUID MECHANICS

(Common with Production Engineering And Automobile Engineering)

Teaching Scheme	Examination Scheme
Lecture : 4 Hrs/week	Theory : 100 Marks
Practical : 2 Hrs/week	T/W : 25 Marks
	Oral : 25 Marks
	Paper Duration: 3 Hours

UNIT – 1

FLUID STATICS

Fluid properties & definition, definition of fluid, Viscosity, Bulk modulus of elasticity, Vapour pressure, Surface tension, Capillary, Speed of sound, Pressure at a point, Liquid pressure on plane area, Curved surface, Center of pressure, Manometer, Buoyancy, Stability of floating and submerged body, Metacentric height, Uniform rotation of open vessels, Pascal's law.

(9 Hrs, 20 Marks)

UNIT – 2

KINEMATICS OF FLUID FLOW

Types of flow, Definition of steady, Unsteady, Uniform, Non uniform, Laminar, Turbulent, 1D-2D flows, Stream line, Streak line, Path line, Irrotational flow, concept of Velocity, potential & stream function flow net (no mathematical treatments) , Continuity equation,2D Eulers equation, Bernoulli's equation along a stream line for compressible and incompressible flow and its application , pitot tube, Ventury meter, Differential monocircular sharp edge mouth pieces and orifice rotometer, Orifices, Orifices meter.

(9 Hrs, 20 Marks)

UNIT – 3

LAMINAR FLOW

Definition, Relation between shear stress & pressure gradient, Flow between parallel plates, Circular tube, Lubrication mechanism, Hagen poiseuille's theory.

TURBULENT FLOW:

Definition, Prandtl's mixing length theory, Velocity distribution, Variation of flow through pipe, Minor loses in pipes & fittings, Darcy-Weisbach equation for frictional head loss, Moody diagram.

(9 Hrs, 20 Marks)

UNIT-4

FLOW THROUGH PIPES

Reynolds's experiment, pipe discharging from a reservoir, pipe connecting two reservoir, pipes in series and parallel, siphon, transmission of power and flow through nozzle.

Introduction to compressible flow, sound wave and Mach no. introduction to unsteady flow in closed conduit oscillation of liquid , phenomenon of surges and water hammer and other there control .

Dimension: - Dimensional homogeneity, dimensional analysis method. Raleigh's method and Buckingham's pi theorem, model analysis, dynamic forces, dimensional less no. , -similitude – based on Reynolds and mach numbers .

(9 Hrs, 20 Marks)

UNIT – 5

RECIPROCATING PUMP

Introduction, main parts, working, single & double acting, slip of reciprocating pump, classification, variation of velocity & acceleration, indicator diagram, air vessel's

HYDRAULIC CIRCUITS

Flow control valve, direction control valves, pressure regulating valves, symbols, different types of hydraulic circuits

(9 Hrs, 20 Marks)

List of practical :-(any eight)

1. Determination of viscosity of given liquid
2. Study Of Manometer
3. Study of stability of floating body.
4. Study of forced vertex motion
5. Flow net by Electrical Analogy Method
6. Calibration of venturi meter/ orifice meter
7. Verification of Bernoullis theorem.
8. Study of Sharp edged circular orifice / mouth piece.
9. Study of momentum equation
10. Study of Laminar and Turbulent flow by use of Reynolds apparatus
11. Study of flow through pipe

Reference Books :

1. R.K. Bansal , Text book of Fluid Mechanics & Hydraulic Machines , Laxmi Publications, Delhi.
2. Dr. P.N Modi , S.M Seth, Hydralic and Fluid Mechanics .
3. S. Ramamurtham ,Fluid Mechanics, Hydraulics and Hydraulic machine ,Danpat Rai & Sons
4. K.L.Kumar , Engineering Fluid mechanics, Eurosa publications House Delhi.
5. S.K Agarwal., Fluid Mechanics & Machinery

Electrical Machines & Industrial Electronics

(Common with Production Engineering And Automobile Engineering)

Teaching Scheme	Examination Scheme
Lecture: 4 Hours/Week	Theory Paper: 100 Marks
Practical: 2Hours/Week	Term Work: 25 Marks
	Paper Duration: 3 Hours.

UNIT-I D.C. MACHINES

Construction, types of generators, Action of motors, significance of back emf, Types of Dc motors, Voltage & current relationship of different motors, Different method of starting (Need of starters), Different methods of speed control, Different types of motor reversing & jogging, Motor stopping, applications.

(9Hrs,marks20)

UNIT-II Induction Motors

Single phase AC Motors, Single phase Induction Motors, Stepper Motor, Servo Motor, their construction, operation & application.

Three-phase induction motors: construction, principle of operation, slip, power flow diagram, torque equation, Maximum & Full load torque, torque slip characteristics, various methods of speed control, different types of starter & application.

(9 Hrs, 20 Marks)

UNIT-III Synchronous Machine

Alternators: construction, synchronous speed, frequency of induced emf, and regulation by synchronous impedance methods.

Synchronous Motors: principle of working, effect of variation of load & excitation, Hunting, method of starting, applications.

Relays: Electromechanical control relays, solid-state relay, timing & latching relays,

(9 Hrs, 20 Marks)

UNIT-IV INDUSTRIAL CONTROL DEVICES

Primary & pilot control devices, manually operated switches, mechanically operated switches. Transducers, Strain guage, LVDT.

Sensors: Proximity sensors, light sensors, Hall effect sensors, Ultrasonic sensors, pressure & temperature sensors, thermistors, IC sensors.

(9 Hrs, 20 Marks)

UNIT-V

Actuators: Classification of actuators, selection criteria of control valves, single acting & double acting cylinders, Electro hydraulic: 3/2 valves, 4/2 valves, and 5/3 valves.

Different types of control systems: motion, pressure, temperature, time, count & sequence controls.

Process & Machines control systems: Types of processes, structure of control systems, controller responses, data acquisition system, computer numerical control & robotics, Basics of PLC programming. Computers in process & machine control

(9 Hrs, 20 Marks)

LIST OF EXPERIMENTS: - (Any Eight)

1. Study of DC Motors.
2. Single phase & 3 phase Alternators.
3. Study of DC generator.
4. Study of AC & DC starters.
5. Study of Single phase & 3 phase Induction motors.

6. Study of LVDT
7. Study of photoconductive & solar cell.
8. Study of Speed control of DC Motor by solid-state devices.
9. Study of Data Acquisition Systems.
10. Study of Transducers

REFERENCE BOOKS

1. Stephen J Chapman, Fundamentals of Electrical Machinery International Student Edition.
2. Nagrath & Kothari, Electrical Machines Tata Mc Graw Hill Publication.
3. Dr. P.S. Bhimra, Generalise Theory of Electrical Machines, Khanna Publication.
4. Frank D. Petruzulla, Industrial Electronics, Mc Graw Hill International Editions.
5. Singh & Khanchandani , Power Electronics, Mc Graw Hill

MANUFACTURING ENGINEERING- I I

Teaching Scheme	Examination Scheme
Lecture: 4 Hours/Week	Theory Paper: 100 Marks
	Term Work: 25 Marks
	Paper Duration: 3 Hours.

UNIT: I THEORY OF METAL CUTTING

Introduction, Mechanics of chip formation, single point cutting tool, method of machining, type of chips, determination of shear angle, undeformed chip thickness, force relation, Energy considerations in metal cutting, Tool wear and tool life, Tool material, economic of metal cutting, Machinability, design of single point cutting tool.

(9 Hrs, 20 Marks)

UNIT: II JIG AND FIXTURES

Definition, purpose and advantages, elements of jig and fixtures, principle of jig and fixture design, locating devices, design principle for location purpose, champing devices, material for location and clamping elements, drill jigs, drill bushes, drill bush material, types of drill jigs, Milling fixture lathe fixture, Economic of jig and fixture selection.

(9 Hrs, 20 Marks)

UNIT: III PRESS TOOL DESIGN

Introduction, Press operation, classification of power presses, Press selection, press working terminology, working of cutting die, principle of metal cutting, clearance, cutting forces, die design fundamentals, blanking and piercing die construction, pilots, strippers and presser pads, press work materials, strip layout, bending die, drawing

operations, variable that affect metal flow during drawing, determining blank size, drawing force.

(9 Hrs, 20 Marks)

UNIT: IV ADVANCE MACHINES

Introduction to CNC Machines, Advantage of CNC, classification of CNC machine, CNC Machine block diagram, part of CNC, steps in CNC manufacturing, CNC part programming, Computer assisted part programming, APT programming.

(9 Hrs, 20 Marks)

UNIT: V FINISHING AND UNCONVENTIONAL MACHINING PROCESSES

Principle of operation, Sketch, advantages, limitations and applications of: Grinding, Honing, Lapping, Buffing, Burnishing, Polishing, Abrasive Jet Machining, Electric Discharge Machining, Electro Chemical Machining, Ultrasonic Machining, Electron beam machining, Laser Beam Machining, Plasma Arc Machining, Ion Beam Machining.

(9 Hrs, 20 Marks)

TERM WORK:

1. Any Assignment on Unit. I
2. Design of jig/ fixture for drilling / milling operation of a given component.
3. Any Assignment on Unit. III
4. Write a program for manufacturing a component on CNC Milling or CNC Lathe.
5. Any Assignment on Unit. V

REFERENCE BOOKS

1 Bawa, Manufacturing Process I & II - Tata McGraw Hill Publication Company. Ltd.

2 E. Paul DeGarmo, J.T. Black, Ronald A. Kohser, Materials and Process Manufacturing - John Willey Publication Ninth edition.

3 Erik K. Henriksen ,Jig and Fixture Design Manual - Industrial Press Inc.

4 Donaldson, Lecain, Goold Tool Design - Tata McGraw Hill Publishing Company. Ltd.

5 P. C. Sharma ,A Textbook of Production Engineering by - S. Chand & Company. Ltd.

6 Grover M. P. CAD/CAM by Grover- Tata McGraw hill Publication Company. Ltd.

WORKSHOP PRACTICE – IV

(Common with Production Engineering And Automobile Engineering)

Teaching Scheme	Examination Scheme
Practical: 4Hours/Week	Term Work: 25 Marks
	Oral: 50 Marks

A] Machine shop

A mini project on die making for Sheet Metal Working, Rubber or Plastic die/ vice assembly/ hammer assembly/ pulley assembly/ coupling assembly/ drilling jig.

B] Plumbing Shop

One pipe assembly including Union, T-joint, Elbow, Cock fitting.

C] Disassembly and assembly of following mechanisms for preventive maintenance

a) All geared head stock
b) Apron mechanism
c) Quick return mechanism
d) Spindle assembly in a Drilling Machine

D] CNC Lathe

One job of programming and manufacturing on CNC, Lathe or Trainer.

E] CNC Milling

One job of programming and manufacturing on CNC, Milling Machine or Trainer.

NOTE: - All jobs specified A to E should be allocated to batch of 5 students and different batches should have different designs of jobs.

DEMONSTRATIONS OF FOLLOWING MACHINES AND PROCESSES TO BE CARRIED OUT IN THE WORKSHOP ONLY.(One hour for each demonstration). (Any Four).

1. Gear Hobbing or Gear Shaping Operation.
2. Operations on Capstan & Turret Lathe and Single Spindle Atocrats.
3. Sheet metalworking on Mechanical or Hydraulic Process.
4. Super finishing operations like Lapping, Honing, etc.
5. Plastic moulding operation Ton-injections moulding machines.
6. Die forging on power hammer.
7. Spot Welding Machine.
8. Different types of grinding wheels, selection criteria, standard marking system of grinding wheel, wheel balancing, truing & dressing operation.
9. Planner.

SCOPE OF THE THEORY: - Theory concerned with different machines, their capabilities, applications & limitations, tool holding, work holding devices etc. for above jobs & demonstrations is to be taught in the workshop only for every batch going to the workshop. Concept of alignment & geometric tolerance required for job No. 1 is to be taught in the classroom.

1. Marketable utility items should be selected & it should be manufactured as per IS codes, e.g. Nuts, bolts, bushes, pins, gas nozzles etc.
2. Setting of turret / caption for assigned jobs should be done by individual student.
3. Preparations of CNC programs for job on CNC machine should be done by groups of students for their jobs.
4. CNC maintenance should be done practically i.e. demonstrations regarding various components of both categories; electronics and mechanical.
5. Determination of cutting speeds, feeds, machining times and other parameters required for above job such as cost estimation etc. and should be compared with market rates.

Reference Books

1.Hajara Choudhary, Bose S. K., Element of Workshop Technology Volume II, Asia Publishing House.

2.P.N. Rao, Production Technology Volume I & II, Tata McGraw Hill Publication.

3.R.K. Jain, Production Technology, Khanna Publishers.

4.P.C. Sharma, Production Technology, Khanna Publishers.

5.Chaprnan W.A. J., Workshop Technology, Volume II, ELBS Publishers.

6.HMT, Production Technology, Tata McGraw Hill Publication.

Faculty of Engineering & Technology

NORTH MAHARASHTRA UNIVERSITY, JALGAON (M.S.)

THIRD YEAR ENGINEERING (T.E.)

(MECHANICAL ENGINEERING)
TERM-I & II

W.E.F.: 2007-08

NORTH MAHARASHTRA UNIVERSITY, JALGAON
T.E. (MECHANICAL)
W.E.F.: 2007-08
TERM-I
Heat Transfer and Mass Transfer
(Common with Automobile Engineering)

Teaching Scheme	Examination Scheme
Lectures: 4 Hrs/ week.	Paper: 3 Hours
Practical: 2Hrs/week.	Paper: 100 Marks
	Practical: 25 Marks
	Term Work: 25 Marks

Unit-I **(10 Hours)**

Concepts and Mechanism of heat flow: Steady and unsteady state heat transfer, Modes of heat transfer, their physical mechanism, Laws of heat transfer, thermal conductivity, heat transfer coefficient, radiation heat transfer coefficient, isotropic and an-isotropic materials. Insulation materials. Thermal resistance and thermal conductance.

Steady state heat conduction without heat generation in plane and composite wall, hollow cylinder, hollow sphere, Thermal contact resistance, critical thickness of insulation on cylindrical bodies.

Generalized one dimensional heat conduction equation and reduction to Fourier, Poisson and Laplace equations. Boundary conditions. Steady state heat conduction with heat generation in plane wall, cylinder and sphere.

(20 Marks)

Unit –II **(10 Hours)**

Extended Surface: Types of fins, governing equation, Fin performance, fin efficiency, fin effectiveness, overall fin effectiveness, approximate solution of fins. Error in temperature measurement by thermometer.

Thermal radiation: Concept, Black body radiation, Spectral and total emissive power, Stefan Boltzmann law, Radiation laws, irradiation and radiosity, Surface absorption, reflection and transmission, emissivity, Radiation view factor, Properties of view factor, (*No numerical treatment on view factor*), radiation heat exchange between two diffuse gray surface, radiation shield. **(20 Marks)**

Unit-III **(10 Hours)**

Principle of heat convection: mechanism, natural and forced convection, convection boundary layers: laminar and turbulent, momentum and energy equation an, Laminar flow over bodies, turbulent flow inside circular and non-circular ducts, Reynolds Colburn analogy for flow over flat plate and flow inside tube, coefficient of friction and friction factor, Heat transfer in fully developed flow, Natural convection over vertical planes, use of empirical correlation for forced and natural convection. Dimensional analysis.

Principle of condensation and boiling (No numerical treatment)

(20 Marks)

Unit-IV **(10 Hours)**

Classification of heat exchangers, temperature distribution in parallel, counter flow arrangement, condenser and evaporator, overall heat transfer coefficient, fouling factor, Log-mean temperature difference method and NTU –effectiveness method of analysis for rating and sizing of heat exchangers. Requirement of good heat exchanger and heat exchanger and design and selection, practical applications, heat pipe. **(20 Marks)**

Unit-V **(10Hours)**

Mass Transfer

Introduction, Modes of Mass transfer, Concentrations, Velocities and fluxes, Concentrations, Velocities, Fluxes, Fick's Law, General Mass Diffusion Equation in Stationary Media, Steady State Diffusion Through a Plain Membrane, Steady-State Equimolar Counter Diffusion, Isothermal evaporation of Water into Air from a Surface, Mass Transfer Coefficient, Convective Mass Transfer, Correlations for Mass Transfer **(20 Marks)**

Note for paper setter:

Paper setter should provide the required data for numerical problems in question paper it self. No use of data book should allow.

Experiment must be set simultaneously and the no. of student in each group working on a setup shall not exceed 05 (five) student.

Any **Eight** Experiments from the following list:

1) Determination of thermal conductivity of metal rod.
2) Determination of thermal conductivity of insulating powder.
3) Determination of thermal conductivity of composite wall.
4) Determination of heat transfer coefficient in natural convection.
5) Determination of heat transfer coefficient in forced convection.
6) Determination of temperature distribution, fin efficiency in natural and forced convection.
7) Determination of emissivity of a test surface.
8) Determination of Stefan Boltzmann constant.
9) Study of pool boiling phenomenon and determination of critical heat flux.
10) Determination of log-mean temperature difference, overall heat transfer coefficient and effectiveness of heat exchanger in parallel and counter flow arrangement.
11) Determination of heat transfer from a heat pipe.
12) Calibration of thermocouple.

Instructions for practical Exam. :-

1. Five experiments shall be selected for Practical Examination.
2. The Number of Students for each Practical set up would not be more than 5 Students.

3. Oral will be based on the Practical Performed in the examination and the experiments included in the Journal.

Recommended Books :

1) J.P.Holman 1992 “Heat Transfer”Mc Graw Hill VII Edition.
2) P.Kothandaraman ,”Fundamentals Of Heat And Mass Transfer”.
3) R.K.Rajput,”Heat And Mass Transfer”, S.Chand & Company Ltd.,New Delhi.
4) D.S.Kumar “Heat And Mass Transfer” D.S.Kumar S.K.Kataria & Sons,Delhi.
5) P.K.Nag, “Heat Transfer” Tata Mcgraw Hill Publishing Company Ltd.,New Delhi.
6) Sachdeva R.C., “Fundamentals Of Heat And Mass Transfer” Wiley Eastern Limited, Third Edition.
7) Sukhatme S.P, “A Text Book On Heat Transfer” (1989) , IIIrd Edition, Orient Longmans Ltd., New Delhi.
8) Arora S.C. & Domkundwar S., “A Course In Heat And Mass Transfer” (1994) , Dhanpat Rai & Sons, IVth Edition.
9) Chapman A.J., “Heat Transfer” (1989), , IVth Edition.
10) Yunus A. Cengel, “Heat Transfer –A Practical Approach” (Tata McGraw Hill)
11) M. M. Rathore “Engineering Heat and Mass Transfer”, 2nd Edition, Laxmi Publications, New Delhi.
12) M. Thirumalseshwar,”Fundamentals Of Heat And Mass Transfer” Pearson Education.
13) R. Rudramoorthy, K. Mayilsomy, “ Heat Transfer”, Pearson Education.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
T.E. (MECHANICAL)
W.E.F.: 2007-08
TERM-I
Machine Design I

Teaching Scheme	Examination Scheme
Lectures: 4 Hrs/ week.	Paper: 4 Hours
Practical: 2Hrs/week.	Paper: 100 Marks
	Oral: 25 Marks
	Term Work: 25 Marks

UNIT:- I Introduction and Design of Simple Machine Parts (10 hours)

a) Design Process

Machine Design, Traditional design methods, Basic procedure of Machine Design, Requisites of design engineer, Design of machine elements, Sources of design data, Use of standards in design, Selection of preferred sizes, Design synthesis, Creativity in design.

b) Stresses and Material Properties

Simple stresses- Tension, compression, bending and torsion, combined effect of different stresses, different material properties

c) Theories of Failures

Maximum principal Stress Theory, Maximum shear stress theory, Maximum principal strain Theory, Maximum strain energy Theory, Maximum Distortion energy Theory

d) Design of Simple Machine Parts

Factor of safety, Service factor, Design of simple machine parts-Cotter joint, Knuckle joint and Stresses in curved beams (for circular cross-section only).

(20 marks)

UNIT:-II Shafts, Keys and Couplings (10 hours)

a) Shafts

Design considerations in Transmission shafts, splined shafts, Shaft design on strength basis, Shaft design on torsional rigidity basis, A.S.M.E. code for shaft design,

b) Keys

Classification of keys, Design considerations in parallel and tapered sunk keys, Design of square, flat and Kennedy keys, Splines.

c) Couplings

Design considerations, Classification, Design of Rigid, Muff coupling, Flange coupling and Flexible bushed pin coupling. **(20 marks)**

UNIT:- III Threaded and Welded joints (10 hours)

a) Threaded Joints: Basic types of screw fastenings-cap screws and set screws, Bolts of uniform strength, Locking devices, I.S.O. metric screw threads, Bolts under tension, Eccentrically loaded bolted joint in shear, Eccentric load perpendicular to axis of bolt,

Eccentric load on circular base, Torque requirement for bolt tightening, Dimensions of standard fasteners, Design of cylinder bolts and turn buckle.

b) Welded Joints

Advantages and limitations of welded joints, Butt and fillet welds, Stresses in butt and fillet welds, Strength of butt welds, parallel and transverse fillet welds, Axially loaded unsymmetrical welded joint, Eccentric load in plane of welds, Welded joint subjected to bending and torsional moments

(20 marks)

UNIT:-IV Power Screws and Mechanical Springs (10 hours)

a) Power Screws

Power screw thread forms, Multiple threaded screws, Torque analysis with square and trapezoidal threads, Self-locking screw, Collar friction torque, Stresses in power screws, Screw jack design.

b) Mechanical Springs

Types, Applications and materials of springs, Stress and deflection equations for helical springs, Style of ends, Design of helical compression and tension springs, Springs in series and parallel, Concentric helical springs, Helical torsion spring, Multi-leaf spring, Shot peening**.** **(20 marks)**

UNIT:- V Design for variable Loads and Statistical consideration in Design (10 hours)

a) Design for Fluctuating Loads

Stress concentration - causes and remedies, Fluctuating stresses, Fatigue failure, S-N curve, Endurance limit, Notch sensitivity, Endurance strength modifying factors, Reversed stresses, Design for finite and infinite life, Cumulative damage in fatigue failure, Solderberg and Goodman diagrams, Modified Goodman diagram, Fatigue design of components under combined stresses such as shafts, bolts and springs.

b) Statistical consideration in design

Frequency distribution – Histogram and frequency polygon – Normal distribution – Units of measurement of central tendency and dispersion – Standard variable – population combinations – Design and natural tolerances –Design for assembly- Statistical analysis of tolerances – Mechanical reliability and factor of safety. **(20 marks)**

Term Work:

1) Term work shall consist of **TWO** design projects. Each design project shall consist of two imperial size sheets –one involving assembly drawing with a part list and overall dimensions and other sheet involving drawings of individual components. Manufacturing tolerances, surface finish symbols and geometric tolerances should be specified so as to make it working drawing. A design report giving all necessary calculations of the design of components and assembly should be submitted in a separate file.

Design projects should be in the form of ‘Design of Mechanical System’ comprising of machine elements studied and topics covered in the syllabus. Design data book shall be used wherever necessary to achieve selection of standardized components.

2) Problem based assignment on each unit

Recommendation:

As far as possible, preference should be given to prepare drawing sheets using computer.

Recommended Books :

1) Shigley J.E. and Mischke C.R., “Mechanical Engineering Design”, McGraw Hill Publication Co. Ltd.
2) Spotts M.F. and Shoup T.E. , “Design of Machine Elements” , Prentice Hall International.
3) Bhandari V.B., “Design of Machine Elements”, Tata McGraw Hill Publication Co. Ltd.
4) Black P.H. and O. Eugene Adams, “Machine Design” , McGraw Hill Book Co. Inc.
5) Willium C. Orthwein, “Machine Components Design”, West Publishing Co. and Jaico Publications House.
6) Design Data”, P.S.G. College of Technology, Coimbatore.
7) Juvinal R.C., “Fundamentals of Machine Components Design”, John Wiley and Sons.
8) Hall A.S., Holowenko A.R. and Laughlin H.G., “Theory and Problems of Machine Design”, Schaum’s Outline Series.
9) P. Kannaiah, “Machine Design”, Scitech publication

NORTH MAHARASHTRA UNIVERSITY, JALGAON
T.E. (MECHANICAL)
W.E.F.: 2007-08
TERM-I
NUMERICAL ANALYSIS AND COMPUTATIONAL METHODS

Teaching Scheme	Examination Scheme
Lectures: 4 Hrs/ week.	Paper: 3 Hours
Practical: 2Hrs/week.	Paper: 100 Marks
	Term Work: 25 Marks

Unit-I **(10 Hours)**

A) Software development -

Software development principles mathematical modeling problem solving, Algorithm, Flowchart , Errors , Graphical method,

B) Solution of transcendental equation -

Bisection method, False position method, successive approximation method, Newton-Raphson method, Horner's method, rate of convergence.

(20 Marks)

Unit-II **(10 Hours)**

A) Numerical Integration

Trapezoidal rule, Simpson's 1\3rd rule, Simpson's 3\8th rule, Gauss quadrature technique,

B) Solution of ordinary Differential Equation

Taylor's series method, Euler's method, Improved & modified Euler's method, Fourth order Range- Kutta method. **(20 Marks**)

Unit-III **(10 Hours)**

A) Interpolation -

Linear and quadratic interpolation, Lagrange's interpolation, Newton's forward interpolation, Newton's backward interpolation, Newton's divided difference interpolation, Stirling interpolation,

B) Curve fitting

Linear & quadratic regression, Logarithmic curve fitting, Exponential curve fitting.

(20 Marks)

Unit-IV **(10 Hours)**

A) Solution of Linear Algebraic Equation -

Gauss elimination method , Gauss Jordan method LU- decomposition method ,

B) Iterative method -

Jacobi iteration method, gauss seidel interactive method, Cholesky method convergence analysis, choice of method. **(20 Marks**)

Unit-V **(10 Hours)**

A) Finite Difference Method

Solution of ordinary differential equation, solution of elliptical equation for various boundary condition, solution of parabolic equation by explicit , implicit and crank-Nicolson method ,

B) Finite Element Method

Finite element method introduction, comparison with finite difference method, general approach, interpolation function, finite element application on one dimensions

(20 Marks)

Term-Work:

Scope of programming should be restricted to practical class only.

Assignments: (Term work include only **EIGHT** assignments.)

1. Introduction to C – Language
   Simple input output, formatted various, if statement, loops, array functions & subroutine introduction algorithm development, flowchart.
2. General program like sorting, conditional interest etc.
3. Solution of quadratic equation.
4. Solution of transcendental (exponential or logarithmic) equation related with engineering application.
5. Calculation of work/heat transferred by using any integration method.
6. One exercise on numerical integration related to mechanical engineering application.
7. Solution of Poisson equation.
8. Solution of one dimensional parabolic equation by Crank-Nicolson method.
9. Curve fitting for the data related to mechanical engineering application.
10. Solution of one/two dimension problem by finite element method using any compatible software.
11. Interpolation for any tabulated data used in mechanical engineering.

Recommended Books:

1) Chapra, Canale," Numerical Method for Engineer",McGraw Hill Co.
2) Joh. H. Mathews," Numerical Methods", Pearson Education.
3) P. Kandaswamy," Numerical Methods",S. Chand & Co. New Delhi.
4) J. N. Reddy," Finite Element Method",McGraw Hill Co.
5) Jain, Jain & Iyangar," Numerical Method for Scientist & Engineering Computation",New Age International Pvt. Ltd.
6) S. S. Shastri," Introductory Method of Numerical Analysis ",Prentice Hill India.
7) Belegundupatla," Introduction to Finite Element Method",Prentice Hill India.
8) Y. Kanitkar, "Let us C", BPB Publications
9) Balgurusamy, "Programming in C", TMH

NORTH MAHARASHTRA UNIVERSITY, JALGAON
T.E. (MECHANICAL)
W.E.F.: 2007-08
TERM-I
THEORY OF MACHINE – II
(Common with Automobile Engineering)

Teaching Scheme	Examination Scheme
Lectures: 4 Hrs/ week.	Paper: 3 Hours
Practical: 2Hrs/week.	Paper:100 Marks
	Oral: 25 Marks
	Term Work:25 Marks

UNIT:-I BRAKES AND DYNAMOMETERS (10 Hours)

A} BRAKES: - a) Types of brakes, b) Force analysis of brakes, external and internal expanding shoe brakes, block brakes, band brakes, block and band brakes, c) Breaking torque.
B} Dynamometer: - a) Absorption dynamometers: prony brakes, rope brake, band brake, transmission dynamometer- belt transmission type, b) Eddy current dynamometer: construction and working principle, c) Torque measurement, d) Fluid coupling. **(20 marks)**

UNIT:- II KINEMATICS OF CAM AND FLYWHEEL (10 Hours)

A} CAM: - a) Types of cams and followers, b) Analysis of motion of follower, c) Determination of cam profile for given follower motion, d) Analysis of cam with specified counters – circular arc cam, tangent cam, e) Cycloidal cam, polydyne cam, kinematics equivalent of cam.
B} FLYWHEEL: - a) Turning moment diagram and fluctuation of the crankshaft speed, D' Alemberts principle b) Equivalent offset inertia force, c) Determination of flywheel size for different types of engine and machine.

(20 marks)

UNIT- III MECHANISMS FOR CONTROL – GOVERNORS AND GYROSCOPES: (10 Hours)

A} GOVERNOR: a) Types of governors – Watts, Porter, Proel, Hartnell governor, b) Sensitiveness of governors, c) Hunting, Isochronisms, stability, d) Effect of governor, e) Power of governor, controlling force.
B) GYROSCOPE: a) Angular velocity and acceleration, b) Gyroscopic forces and couple, c) Gyroscopic effect on naval ships, d) Gyroscopic stabilization, stability of two wheel vehicle. **(20 marks)**

UNIT–IV GEAR AND GEAR TRAIN **(10 Hours)**

GEAR:

a) Spur Gears:- Terminology used in gears, conjugate action, in volute and cycloidal profile, path of contact, arc of contact, contact ratio, interference, undercutting, methods to avoid undercutting and interface, gear standardization, effect of center distance variation on the velocity ratio for involute profile tooth gears, friction between gear teeth.

b) Helical Gears: - Torque transmitted by helical gears on parallel shafts, normal and transverse module.

c) Spiral Gears: - Spiral angle, shaft angle, and efficiency of spiral gear.

d) Worm and Worm Gear: - Terminology and geometrical relationship, efficiency of worm gears.

GEAR TRAINS: - Types of gear trains, velocity ratio, tooth load, torque transmitted Holding torque **(20 Marks)**

UNIT: - V BALANCING: **(10 Hours)**

Balancing of rotating masses in one and several planes

Balancing of reciprocating masses in single and multi-cylinder engine, radial and V-types.

Primary and secondary balancing analysis,

Concept of direct and reverse cranks.

Balancing of locomotive engines and effect of partial balancing.

Static and dynamic balancing machine. **(20 marks)**

Term-Work:

Term work shall consist of any '**EIGHT**' experiments of the following: -

1) Study of various types of gearboxes such as industrial gearboxes, Synchromesh gearbox, Differential gearbox.
2) To draw the conjugate profile for any general shape of gear tooth.
3) To generate gear tooth profile and to study the effect of undercutting and rack shift using models.
4) To determine torque capacity of dynamometer.
5) To study epi-cyclic gear train and to measure torque transmitted and holding torque.
6) To draw cam profile for various types of follower motion.
7) To determine the characteristics curve of a centrifugal governor and to find its coefficient of insensitiveness and stability.
8) Verification of principle of gyroscopic couple.
9) Study of any two gyro controlled instruments.
10) To study the dynamic balancing machine and to balance a rotor.
11) Study of different types of brakes.
12) Study of gyroscopic effect on Naval ship and Four wheel vehicle.

ORAL:

Oral will be based on the prescribed term-work presented in the form of certified journal only.

Recommended Books:

1) Thomas and Bevan, “Theory of Machines” Tata Mc Graw Hill
2) P.L.Balany, “Theory of Machines and Mechanisms”, Khanna Publications.
3) Jagdishlal, ”Theory of Machines and Mechanisms” Metropolitan Book Company.
4) S.S.Ratan , “Theory of Machines and Mechanisms” Tata Mc Graw Hill
5) Shigley, “Theory of Machines and Mechanisms” Mc Graw Hill International
6) Sadhu Singh, “Theory of Machine” Pearson Education
7) J.S.Rao, ”Theory of Machines” New Age International Publishers.
8) J.S.Rao, “Theory of Machines”, New Age International Publishers.
9) J Srinivas, “ Mechanism and Dynamics of Machinery “, Scitech Publication.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
T.E. (MECHANICAL)
W.E.F.: 2007-08
TERM-I
INTERNAL COMBUSTION ENGINE
(Common with Automobile Engineering)

Teaching Scheme	Examination Scheme
Lecture: 4 Hour/Week	Paper: 3 Hours
Practical: 2 Hours/Week	Paper: 100 Marks
	Term Work: 25 Marks

UNIT:- I BASIC CONCEPTS AND ENGINE CYCLES (10 hours)

Availability of energy (Elementary treatment only): Introduction to available and unavailable energy, availability of system with heat transfer. Entropy generation and second law efficiency. (No numerical treatment on above contents)

Introduction, Classification, engine components and their functions, Terminology, Work (indicated and brake), mean effective pressure, torque and power (brake and indicated), mechanical efficiency, thermal and volumetric efficiencies of engine, air fuel ratio, specific fuel consumption.

Air Standard Cycles: Assumptions, Otto, Diesel, Dual Combustion cycle, derivation of their efficiency equation, work done and mean effective pressure. Comparison on the basis of heat input, compression ratio, Maximum pressure and temperature, Actual cycle, deviation from theoretical cycles. Pumping losses, time losses, Stirling and Ericsson cycle.

(20 Marks)

UNIT:- II FUEL FEEDING SYSTEMS (10 hours)

Charge, intake valve and manifold, valve timing diagram, valve overlap, choked flow.

Carburetion: Requirement, types of carburetors according to fluid flow, simple carburetor, Air fuel ratio calculation, effect of altitude, disadvantages of simple carburetor, compensating devices for starting, economy range, acceleration, compensating jet etc. additional systems in modern carburetors, Solex carburetor. Disadvantages of carburetion and gasoline injection, MPFI.

Fuel feeding systems in CI engines: Requirement, classification, fuel feed pump, jerk type injection fuel pump, distributor type pump, injection pump governor, fuel injector and nozzles. **(20 Marks)**

UNIT:- III OPERATING SYSTEMS (10 hours)

Cooling systems: requirement, types of cooling systems, thermostat and additives.

Lubrication: Mechanism of lubrication, different methods, important properties of lubricating oils.

Governing of IC engines: requirement, quantity, quality, hit and miss type governing.
Ignition Systems: requirement, battery ignition, magneto ignition, electronic ignition system in two stroke engines, Ignition timing, spark timing advance.
Starting methods of engines. types of superchargers, Super charging, effect of super charging, limitations and advantages of supercharging, and turbo charging of engines.

(20 Marks)

UNIT:- IV COMBUSTION IN SI AND CI ENGINES (10 hours)

Homogeneous and heterogeneous mixtures, Combustion in SI engines: Stages in combustion, Ignition lag, velocity of flame propagation, factors influencing flame speed, rate of pressure rise, Detonation, factors affecting the detonation, pre-ignition. Rating of SI engines fuels, Dopes, combustion chamber of SI engines.
Combustion in CI engine; stages of combustion, factors affecting the delay period. Diesel knock, Effect of engine variables on Diesel knock , Rating of CI engine fuels: Cetane number, performance number, comparison of knock in SI and CI engines. Combustion chamber for CI engines.

(20 Marks)

UNIT:- V ENGINE TESTING AND PERFORMANCE (10 hours)

Measurement of indicated power, brake power, Morse test, energy balance and efficiency calculations, BIS specification. Recent trends in internal combustion engines.
Engine emission, air pollution due to engines, EURO I and EURO II norms, Unburnt hydrocarbon emission in two stroke and CI engines, CO and Nox emission, particulate traps, EGR, emission control methods catalytic converters (Introductory), crank blow by losses. **(20 Marks)**

List of Experiments

Minimum **EIGHT** experiment should be performed form the following lists:
1) Study of cooling systems.
2) Study of lubrication systems.
3) Study of simple and Solex carburetors.
4) Study of fuel pump and fuel injector.
5) Trial on a petrol engine and calculation of air/fuel ratio, volumetric, thermal and mechanical efficiencies.
6) Trial of a Diesel engine and calculation of air/fuel ratio, volumetric, thermal and mechanical efficiencies.
7) Morse test and determination of bsfc and isfc.
8) Study of combustion chambers of SI engines.
9) Study of combustion chambers of CI engines.
10) Study and demonstration of mechanical and Pneumatic governors.
11) Study and analysis of exhaust emission from the engine (PUC).

Recommended Books :

1) V. Ganeshan, “Internal Combustion Engines”, 2/e, Tata McGraw Hill, New Delhi.
2) R. K. Rajput , “Internal Combustion Engines”’, Laxmi Publications, New Delhi.
3) W. W. Pulkrabek , “Fundamentals of Internal Combustion Engines”, Prentice Hall of India (P) Ltd., New Delhi.
4) E. F. Obert , “Internal Combustion Engines and Air Pollution”, Harper and Row, New York.
5) Ferguson C. R , “Internal Combustion Engines”, Wiley Inc. New York.
6) Sharma R.P. and Mathur M.L., “Internal Combustion Engines”, Standard Publications, New Delhi.
7) Domkundwar, ., “Internal Combustion Engines”, Dhanpat Rai & Co. New Delhi.
8) Willard W Pulkrabek. “Internal Combustion Engines”, Pearson Education
9) Shyam K. Agrawal, “Internal Combustion Engines”, New Edge International Publication.
10) K.K. Ramalingam, “Internal Combustion Engines”, Scitech Publication.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
T.E. (MECHANICAL)
W.E.F.: 2007-08
TERM-I
COMPUTER PROGRAMMING IN C / C++
(Common with Automobile Engineering)

Teaching scheme	Examination Scheme
Practical: 2hrs/week	Term work: 25 marks

a) One assignment on introduction to computer

b) To develop and Run "C/C++" programs for machine elements like

(Any two on C and two on C++)

a) Design of knuckle joint or turnbuckle joint

b) Design of power screw

c) Design of helical spring

d) Design of splines

e) Design of muff coupling

f) Theories of failure etc.

Recommended Books:

1) Balgurusamy, "Programming in C" Tata McGraw Hill Publication Co. Ltd.
2) Y. Kanitkar, "Let us C" BPB Publications.
3) M. P. Grover and Zimmer, "CAD/CAM" PHI Pvt. Ltd.
4) Shigley J.E. and Mischke C.R. "Mechanical Engineering Design" McGraw Hill Publication Co. Ltd.
5) Spotts M.F. and Shoup T.E. "Design of Machine Elements" Prentice Hall International.
6) Bhandari V.B. "Design of Machine Elements" Tata McGraw Hill Publication Co. Ltd.
7) Balgurusamy, "Object Oriented Programming with C++" Tata McGraw Hill, New Delhi
8) Ravi Chandran, "Programming in C++" Tata McGraw Hill Publication Co. Ltd.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
T.E. (MECHANICAL)
W.E.F.: 2007-08
TERM-I
Entrepreneurship Development Skill/ Human Research Training
(Common with Automobile Engineering and Production Engineering)

Examination Scheme
Term Work: 25 Marks

Study the following topic from Entrepreneurship Development from the literature/ books and submit a report it.

1) Introduction
- Entrepreneur
- Entrepreneur-ship.

2) Information gathering for identification of opportunity.
- Entrepreneurial process.

3) Information gathering techniques.

4) Product and Services
- Theory
- Product specifications.
- Market research, survey.
- Functions of marketing.
- Research and Development activity.

5) Procedures for estimation of resources required for establishment enterprise or starting service business.
- 5.1 Space.
- 5.2 Human Resources.
- 5.3 Equipments.
- 5.4 Financial Resources

6) Establishing and running enterprise
- Management of enterprise.
- Team spirit.
- Motivation.
- Communication

7) Budgeting and accounting expenditures for running enterprises.
- 7.1 Concept of budgeting.
- 7.2 Budget preparation.
- 7.3 Different type of budgets

8) Procedure of accounting expenditures
- 8.1 Preparation of P&L account and Balance sheet.

9) Quality Control

10) Procedure of report writing for getting approval from financial agencies.

10.1 Financial Resources.

10.2 Financial Corporations

OR

Attend a course of Entrepreneurship Development conducted by college and submit a report on it.

OR

Attend a course of H. R. Training conducted by college and submit a report on it.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
T.E. (MECHANICAL)
W.E.F.: 2007-08
TERM-II
ENGINEERING METALLURGY
(Common with Automobile Engineering and Production Engineering)

Teaching Scheme	Examination Scheme
Lectures: 4 hrs. /week	Paper: 3 Hours
Practical: 2 hrs. /week	Paper: 100 marks.
	Term-work: 25 marks.

UNIT I : **(10 Hours)**

Metallography, Introduction, Microscopy and macroscopy, Sample preparation, sampling or sectioning, mounting, Grinding, Polishing Etching, Mechanism of Etching for single phase and multiphase alloys, Etching Reagents, Electrolytic polishing, Metallurgical microscope working principal Properties of lenses such as magnifying power, numerical aperture, Resolving power etc, Macroscopy, sulphur printing Flow line observations, Examination of fractures.

Steels: - Plain carbon steels, Iron – carbon Equilibrium Diagram, various phases in the diagram, various phase reactions identified in the diagram, solubility of carbon in iron, Allotropy, critical temperature, Microstructure of slowly cooled steels, estimation of carbon from microstructure, Non – Equilibrium cooling of steels. Specification of some commonly used steels for engineering applications.

(20 Marks)

UNIT II : **(10 Hours)**

Heat Treatment, Introduction, and Principles of heat treatment of steel, Transformation. Products of Austenite, Equilibrium diagrams as Aids, Heat Treatments for steel-principles & processes such as annealing, normalizing, Heat treatment used to incrase strength of steel, Isothermal tranformation Diagram, Tempering of martensite, oter heat treatment methods such as austempering, patenting,isoforming, martemperig, Ausforming,etc., continious cooling Transformation, Jominey Test for Hardenability, Hardenability considerations, Quenching media, Techinques to reduce the cracking,

(20 Marks)

UNIT III: **(10 Hours)**

Surface Hardening Treatments of steel : selective Heating Techniques, Flame Hardening, Induction and laser beam hardening, Electron beam hardening, Techniques Involving Altered surface chemistry, carburising, pack, Gas and liquid Carburizing, Nitrding,

Heat Treatment furnaces & Atmospheres : Furnace types, Furnace controls, Heat Treatment and energy, controlled atmosphere. **(20 Marks)**

UNIT IV: **(10 Hours)**

Engineering Alloy steels :- Effect of alloying elements, types of alloy steels, stain less steel, types,and Applications and method of selection. Sensitization and weld decay of stainless steel.Heat-treatment of high speed steels, classification and types tool steels, such as water hardening, shock resistance, cold work and Hot work tool steels and their heat treatment.

Cast irons: - classification, Effect of controlling eutectic reaction on microstructure and properties of cast iron, carbon Equivalent,white cast iron, malleable cast iron, gray cast iron, S.G.iron, chilled and alloy cast iron, Properties, specifications and applications in machine tools, Automobile and pump Industry. **(20 Marks)**

UNIT V: **(10 Hours)**

Engineering Non- Ferrous metals and Alloys : Introduction, Copper and it's alloys, Brasses and Bronzes, Copper-Nickel alloys, Aluminum and it's alloys, Bearing Materials, Lead, Tin and it's alloys Heat Treatment of Non- Ferrous metals, Precipitation or Age Hardening.

Composite Materials: Classification, different types of composite material and it's applications **(20 Marks)**

List of Experiments:

Note: Minimum **EIGHT** experiments must be performed out of following ten experiments.

1) Micro Specimen Preparation and use of metallurgical microscope, objective (a) To provide the practice in the techniques of micro specimen selection, grinding, polishing and etching; (b) To provide initial training in the use of metallurgical microscope

2) Study and drawing microstructure of low carbon, medium carbon, eutectoid steel, hypereutectoid steel in annealed condition.

3) Study and drawing microstructure of Gray, White, Malleable and Spheroidal Graphite Cast Iron.

4) Furnace operations and spark testing, objectives (a) to determine the natural (empty furnace) heating and cooling rates of an available laboratory furnace. (b) to draw the spark diagrams of low , medium, high carbon steel, cast iron, stainless steel

5) Sulphur print test on steel specimen or flow lines examination on forged components

6) Study of change in microstructure of annealed and normalized medium carbon steel, Objective (a) To anneal and normalized the sample of medium carbon steel in to the laboratory furnace and to find out hardness and microstructure of steel

7) Jomney Harden ability test, Objective (a) To conduct the Jomney harden ability test on two types of steel specimen.

8) To study the effect of carbon on hardness of harden and tempered steel

9) Study and drawing microstructure of alpha brass, alpha-beta brass, Aluminum Bronze and bearing metal

10) To study the effect of temperature on hardness of tempered steel

Recommended books:

1) E Paul Degarmo, J.T. Black, Ronald A. Kosher, “Material and Process In Manufacturing”, 9th Edition, John Wiley Inc.
2) V.D.Kodgire, “Material Science and Metallurgy for Engineers”, Everest Publishing House. Pune
3) B. K. Agrawal, “Introduction to Engineering Materials”, Tata Mcgraw Hill, New Delhi.
4) S.H. Avner, “An Introduction to Physical Metallurgy”, Tata Mcgraw Hill, New Delhi.
5)Raymond A.Higgins,” Engineering Metallurgy (Part I&II)”,ELBS Publication,London
6) Clark D.S.,” Physical Metallurgy for Engineers”, Affiliated East-West Press pvt. Ltd., New Delhi
7) Rollason A.C.,” Metallurgy for Engineers”, ELBS publication,London
8) W Calister, Material Science and Engineering, Wiley-Students Edition.
9) A.S.T.M./A.S.M. Hand books on Metallography, Steels, Heat Treatment of Steels & Furnaces
10) Kenneth G. Budinski and Michael K. Budinski, “ Engineering Materials Properties and Selection”, Pearson Education.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
T.E. (MECHANICAL)
W.E.F.: 2007-08
TERM-II
Machine Design II

Teaching Scheme	Examination Scheme
Lectures: 4 Hrs/ week.	Paper: 4 Hours
Practical: 2Hrs/week.	Paper: 100 Marks
	Oral: 25 Marks
	Term Work: 50 Marks

UNIT:- I Friction Clutches and Brakes (10 Hours)

a) Friction Clutches:

Classification and selection of friction clutches, Torque transmitting capacities and Design of single-plate, multi-plate, cone and centrifugal clutches, Types of friction materials - their advantages, limitations and selection criteria.

b) Brakes:

Energy absorbed by brake, Design considerations in pivoted block brake with long shoe, internal expanding shoe brake and disk brake, Temperature rise in brake operation. **(20 marks)**

UNIT:- II Belts and Chain Drives (10 Hours)

a) Belts

Materials and construction of flat and V-belts, Geometric relationships for length of belt, Power rating of belts, Maximum power condition, Selection of flat and V-belts from manufacturer's catalogue, Belt tensioning methods, Relative advantages and limitations of flat and V-belts, Construction and applications of timing belts.

b) Chain Drives

Construction and materials of roller chain, Length of chain and number of links, Polygonal effect, Power rating of roller chains, Construction of sprocket wheels, Silent chains, Relative advantages and limitations of chain drives.

c) Aesthetic and Ergonomic considerations in Design

Asthetic considerations- Basic types of product forms, design features like shape,colour, materials and finishes, quality etc. Ergonomic considerations- Man-Machine closed loop system, design of display panels, design of controls etc. **(20 marks)**

UNIT:-III Spur and Helical Gear Drives (10 Hours)

Classification of gears, Selection of types of gears, Standard systems of gear tooth.

a) Spur Gears:

Number of teeth and face width, Types of gear tooth failure, Desirable properties and selection of gear material, Constructional details of gear wheel, Force analysis, Beam strength (Lewis) equation, Velocity factor, Service factor, Load concentration factor, Effective load on gear, Wear strength (Buckingham's and spott's) equation, Estimation

of module based on beam and wear strength, Estimation of dynamic tooth load by velocity factor and Buckingham's equation, Methods of gear lubrication.
b) Helical Gears:
Transverse and normal module, Virtual number of teeth, Force analysis, Beam and wear strengths, Effective load on gear tooth, Estimation of dynamic load by velocity factor and Buckingham's equation, Design of helical gears.

(20 marks)

UNIT:- IV Bevel and Worm Gear Drives (10 Hours)

a) Bevel Gears:
Straight tooth bevel gear terminology and geometric relationship, Formative number of teeth, Force analysis, Design criteria of bevel gears, Beam and wear strengths, Dynamic tooth load by velocity factor and Buckingham's equation, Effective load, Design of straight tooth bevel gears, Selection of materials for bevel gears, comparison of spiral bevel gears and hypoid gears and straight tooth bevel gears.
b) Worm Gears:
Worm and worm gear terminology and geometrical relationship, Types of worm and worm gears, Standard dimensions, Force analysis of worm gear drives, Friction in Worm gears and its efficiency, Worm and worm-wheel material, Beam strength and wear strength of worm gears, Estimation of dynamic load by velocity factor and Buckingham's equation, Thermal consideration in worm gear drive, Methods of lubrication. **(20 marks)**

UNIT:- V Rolling contact Bearings and Pressure Vessels (10 Hours)

a) Rolling Contact Bearings
Types of rolling contact bearings, Static and dynamic load carrying capacities, Striback's equation, Equivalent bearing load, Load-life relationship, Selection of bearing life, Selection of rolling contact bearings from manufacturer's catalogue, Design for cyclic loads and speed, Bearing with probability of survival other than 90%, Lubrication and mounting of bearings, Types of failure in rolling contact bearings - causes and remedies.
b) Design of Cylinders and pressure vessels: Thick and thin cylinders – Thin cylindrical and spherical vessels – Lame's equation – Clavarino's and Birnie's equations– Auto frettage and compound cylinders – Gasketed joints in cylindrical vessels. Unfired pressure vessels – Classification of pressure vessels as per I. S. 2825 – categories and types of welded joints – weld joint efficiency – Corrosion, erosion and protection vessels, stresses induced in pressure vessels, materials of construction. Thickness of cylindrical and spherical shells and design of end closures as per code – Nozzles and Openings in pressure vessels –Reinforcement of openings in shell and end closures. Area compensation method. **(20marks)**

Term Work

1.Term work shall consist of "ONE" design project. The design project shall consist of two imperial size sheets – one involving assembly drawing with a part list and overall dimensions and the other sheet involving drawing of individual components.

Manufacturing tolerances, surface finish symbols and geometric tolerances should be specified so as to make it working drawing. A design report giving all necessary calculations of the design of the components and assembly should be submitted in a separate file.

Design projects should include selection of prime mover and design of mechanical systems comprising of machine elements:

Spur gears and helical/bevel/worm gears OR Belt/chain/rope and clutch/brake etc.

Design data book shall be used extensively for the selection of the components.

2.Problem based assignment on each unit

Recommendation

As far as possible, preference should be given to prepare drawing sheets using computer.

Recommended Books :

1) Shigley J.E. and Mischke C.R., "Mechanical Engineering Design" McGraw Hill Pub. Co. Ltd.
2) Spott's M.F. and Shoup T.E., "Design of Machine elements", Prentice Hall International.
3) Bhandari V.B., "Design of machine elements", Tata McGraw Hill Public Co. Ltd.
4) Black P.H. and O. Eugene Adams, "Machine Design", McGraw Hill Book Co. Ltd.
5) Willium C. Orthwine, "Machine Components Design", West-Pub. Co. an Jaico Pub. House.
6) "Design Data", P.S.G. College of Technology, Coimbatore.
7) Juvinal R.C., "Fundamentals of Machine Components Design", John Wiely and Sons.
8) Hall A.S., Holowenko A.R. and Laughlin H.G., "Theory and Problems of Machine Design", Schaum's Outline Series.
9) P. Kannaiah , "Machine Design", Scitech Publication

NORTH MAHARASHTRA UNIVERSITY, JALGAON
T.E. (MECHANICAL)
W.E.F.: 2007-08
TERM-II
TURBO MACHINERY

Teaching Scheme	Examination Scheme
Lectures: 4 Hrs/ week.	Paper: 3 Hours
Practical: 2Hrs/week.	Paper: 100 Marks
	Oral: 25 Marks
	Term Work:25 Marks

Unit-I **(10 Hours)**

STEAM TURBINES : Types of turbines, constructional details impulse turbine, compounding of turbine, velocity diagrams, output efficiency, losses in turbines, reaction turbine, velocity, diagrams, degree of reaction, constructional features of blades.

Governing of turbines, application of turbines, types of seals, and packing to reduce leakage, losses in turbines. **(20 marks)**

Unit-II **(10 Hours)**

GAS TURBINE : Theory and fundamentals of gas turbines, principles, classification, Joule's cycles, assumptions for simple gas turbines, cycle analysis, work ratio, concept of maximum and optimum pressure ratio, actual cycle, effect of operating variable on thermal efficiency, regeneration, intercooling, reheating, their effects on performance, closed cycle and semiclosed cycles gas turbine plant, applications of gas turbines.

(20 marks)

Unit-III **(10 Hours)**

JET PROPULSION:- Introduction, theory of jet propulsion, types of jet engines, energy flow through jet engines, thrust, thrust power, and propulsive efficiency, turbo jet, turbo prop, turbo fan engines, pulse jet and ram jet engines, performance characteristics of these engines, thrust segmentation application of jet engines, concept of rocket propulsion.

ROTARY COMPRESSOR :-

Concepts of rotary compressors, root blower and vane type compressors, centrifugal compressors, velocity diagram and expression for work done, introduction to terms like slip factor, power input factor.

(20 marks)

Unit-IV **(10 Hours)**

HYDRAULIC TURBINES :

Impulse momentum principle, fixed and moving flat plate and curve vanes, series of plates & vanes, velocity triangles and their analysis, work done, efficiency etc. classification of hydraulic turbines, Heads & various efficiencies,

Impulse turbine : Main components and constructional features of pelton wheel, velocity diagrams & work done, condition for max. hyd. Efficiency, number of buckets, jets, Non dimensional parameters (speed ratio, jet ratio).

(20 marks)

Unit-V **(10 Hours)**

HYDRAULIC TURBINES (REACTION TYPE)

Reaction turbine, main components & constructional features, types of reaction turbine (Francis, Kaplan), draft tube types, efficiency, cavitations, governing mechanisms for pelton wheel, Francis, Kaplan turbines, Types of characteristic curves, unit quantities, selection of turbine considering various factors, specific speed, Application of similarity as applied to turbines, scale effect.

(20 marks)

Any **Eight** Experiments based on the following list:

1) Study of steam turbine power plant.
2) Study of steam turbine systems.
    a) Methods of compounding
    b) Methods of governing
    c) Losses in steam turbine
    d) Lubrication system.
3) Trial on steam turbine.
4) Study of gas turbines.
5) Study of hydraulic turbines.
6) Trial on pelton wheel.
7) Trial on Francis turbine.
8) Trial on Kaplan turbine.
9) Trial on gas turbine plant.
10) Trial on centrifugal / rotary flow air compressor.
11) Study of various jet propulsion devices / engine.
12) Visit to hydraulic power plant.

Note : Oral will be based on the prescribed term-work presented in the form of certified journal.

Recommended Books :

1) Domkundwar, “Thermal Engineering”, Dhanpat Rai and Co Ltd. Delhi
2) P L Ballaney , “Thermal Engineering”. Khanna Publications, Delhi.
3) R K Rajput , “Thermal Engineering”, Laxmi Publication ltd. New Delhi.
4) Dr. R. K. Bansal, “Fluid Mechanics and Hydraulic M/c”, Laxmi publication Ltd. New Delhi.
5) Dr. Jagdish Lal, “Hydraulic Machine”. Metro politan book co. pvt Ltd. Delhi
6) Dr Modi seth, “Hydraulics & Fluid Machine”. Standard book house Delhi.

7) R. Yadav “Steam & Gas turbine”, Central Publications, Allahbad.
8) J. K. Jain “Gas Turbine Theory & Jet Populsion”, Khanna Publications, New Delhi.
9) Cohen, Roger “Gas Turbine theory”, Longman Publications.
10) Gopalkrishnan “A Treatise on Turbomachines”, Scitech Pub. (India)pvt.Ltd,Chennai
11) Kadambi V. & Prasrd M, “Turbo Machinery”, New Age International Publication New Delhi.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
T.E. (MECHANICAL)
W.E.F.: 2007-08
TERM-II
MECHANICAL MEASUREMENT AND METROLOGY
(Common with Automobile Engineering and Production Engineering)

Teaching Scheme	Examination Scheme
Lectures: 4 Hrs/ week.	Paper: 3 Hours
Practical: 2Hrs/week.	Paper: 100 Marks
	Oral: 25 Marks
	Term Work:25 Marks

Unit-I **(10 Hours)**

Fundamental of instrumentation, Block diagram of measuring instruments, Static and dynamic characteristics, Errors and source of error, Sensors and Transducers.

Signal transmission and processing:Intermediate Modifying devices-Mechanical, electrical & electronics,Terminating devices- Meter indicators, Mechanical Counters, CRO, XY plotters, oscillograph,

Data acquisition system: Introduction, Digital recording system,microprocessor based system **(20 Marks)**

Unit-II **(10 Hours)**

Measurement of force and torque: Introduction, Different type of load cells, dynamometers- Mechanical, electrical, hydraulic.

Pressure and flow measurement: Bourdon tube, diaphragm and bellows, vacuum measurement – McLeod gauge, thermal, conductivity gauge, Dead weight gauge tester, Electromagnetic flow meter, Ultrasonic flow meter, rotameter

Strain measurement: Types of strain gauge & their working, strain gauge circuits, Temperature compensation, Strain rosettes, Temperature measurement by electrical effects, RTD, Pyrometer. **(20 Marks)**

Unit-III **(10 Hours)**

Metrology Introduction: Definition and concept of metrology, standards of measurements. Classification of methods of measurement, precision and accuracy

Linear Measurement: Line standard and end standard, Wavelength standard, Slip gauges,

Measurement of geometric features, Machine tool metrology, Design and manufacture of gauges.

Comparators: Types, construction and working of different Mechanical, Optical, Electrical, Pneumatic comparators, Interferometry: Basic principles, Source of light, Optical flats, Fringe pattern and their interpolation.

(20 Marks)

Unit-IV **(10 Hours)**

Angular Measurement Angle standard, Sine bars, Sine centers, Angle gauges, autocollimator, angle Dekker, optical square, taper measurement, Universal bevel protractor,

Measurement of surface finish Surface texture, assessment of surface roughness as per IS, Tomlinson surface meter, and other surface measuring devices

Screw thread measurement: Terminology, errors in thread, Measurement of elements of external & internal threads,

Gear metrology: Gear terminology, measurement of element of gears

Toolmakers microscope, Profile projector. **(20 Marks)**

Unit-V **(10 Hours)**

Measuring Machines

UMM, CMM, Numerically controlled CMM, Fluidic system NC system, Recent trends in Engineering Metrology, Development in optical measurement, Precision instruments based on laser, Probes, telemetric system, Isometric viewing of surface defects, Nano technology

Quality control:

Introduction, Inspection, Sampling plans, Control charts. (X, R, C,P), Problems based on control charts, Recent trends in quality control (TQM,TQC,Six Sigma, Zero defect)

(20 Marks)

Any **Eight** Experiments based on the following list:

1) Determination of linear and angular dimension.
2) M/c tool alignment tests on any M/c tool like Lathe, Drilling m/c, Milling m/c
3) Measurement of surface finish and testing of surface flatness by optical flat
4) Study and measurement of parameter using tool makers microscope Use of comparator.
5) Measurement of screw parameter using floating carriage micrometer
6) Measurement by gear parameter- Gear tooth thickness, constant chord, pitch circle diameter
7) Measurement of temperature using thermocouple and pyrometer
8) Calibration of strain gauge meter
9) LVDT for displacement measurement
10) Flow measurement-using rotameter.

Recommended Books:

1) Beckwin Marrongoni and Lienhard , “Mechanical Measurement”, Pearson Educations
2) I.C.Gupta, “Engineering Metrology” , Dhanpat Rai & Sons
3) M.S.Mahajan, “Engineering Metrology”, Dhanpat Rai & Sons.

4) R.K.Jain, “Engineering Metrology”, Khanna Publications.
5) Doeblin, “Measurement System Application & Design”,McGraw Hill New Delhi.
6) D.S.Kumar, “Mechanical Measurement”,
7) A.K.Sawhaney, “ Mechanical Measurement and Instruments”, Dhanpat Rai and Sons
8) H.S.Kalsi, “ Electronic Instrumentation”, TMH
9) K.L.Narayanan, “Engineering Metrology”, Scitech Publication
10) R.S.Sirohi, H.S.Radhakrishnan, “Mechanical Measurement’’, New Age International

NORTH MAHARASHTRA UNIVERSITY, JALGAON
T.E. (MECHANICAL)
W.E.F.: 2007-08
TERM-II
PROJECT AND BUSINESS MANAGEMENT

Teaching Scheme	Examination Scheme
Lectures: 4 Hrs/ week.	Paper: 3 Hours
Practical: 2Hrs/week.	Paper:100 Marks
	Term Work:25 Marks

Unit-I **(10 Hours)**

Introduction, Basic concept of project management, Types of projects, Project identification & Formulation scheduling, Monitoring, Control benefits, Basic tool & techniques for project scheduling, Calendar schedule, Bar chart, Project life cycle curves, Line & balance, Problems on Line balancing.

(20 Marks)

Unit-II **10 Hours)**

Net Work Models: Introduction to PERT and CPM , Fundamental concept and network models and construction of network diagrams . PERT activity , time cstimatcs,critical and project time duration. Optimization of project time and cost in PERT network.

(20 Marks)

Unit-III **(10 Hours)**

Forms Of Business Organization: Concept of Ownership Organization , Types of ownership, Individual Ownership, Partnership organization ,Distinction between individual ownership & Partnership ,joint stock companies ,types of stock companies ,comparison between private & public Ltd. Co's.,distinction between partnership and joint stock, Co-operative Organisations,varuios types of co-operative societies, distinction between co-operative & joint stock companies ,distinction between private sector and public sector ,Public sector organization, State ownership, public co-operation, choice of form of organization ,comparative evaluation of different forms of business ownership. **(20 Marks)**

Unit-IV **(10 Hours)**

Financial Management: Introduction, Definition of financial management, functions of financial management , Sources of Funds, Capital, classification of capital, working capital, need for working capital, assessment of working capital ,Factors affecting working capital, Capitalization ,Sources of finance (Shares, debentures, difference between preference shares and equity shares, loans from banks, trade credit public deposits financial institutions)

Cost and cost control : Elements of cost, direct cost, indirect cost, variable and fixed cost, cost control technique, marginal costing, break even analysis.

(20 Marks)

Unit-V **(10 Hours)**

Material & Purchase Management: Scope, advantages of material management, function of material management, objectives of scientific purchasing ,functions of purchase department, classification of functions, 5R's Of Buying ,Methods of buying, Centralized versus decentralized buying, buying procedure, organization structure

Inventory management : Objective, types of inventory, selective inventory technique(ABC,VED,SDE,GOLF), Inventory model (Economic lot size with fixed price, EOQ with quantity discount) **(20 Marks)**

TERM WORK : Any **FIVE** assignments based on each unit.

Recommended Books:

1) Chase, Aquilano," Production and Operation Management",7th Edition-McGraw Hill Publishing Co. New Delhi., 1995.
2) Chary," Theory And Problems in Production and Operations Management",2nd Reprint, Tata McGraw Hill Publishing Co. New Delhi., 1996.
3) Nair,N.G.,"Production & Operations Management",Tata McGraw Hill Publishing Co. New Delhi.,1997.
4) Phillips,Don.T.,Ravindran,A.& James Solberg,"Operations Research Principle & Practice",John Wiley & Sons,1986.
5) Chadra Presanna ," Fundamentals of Financial Management" Tata McGraw Hill New Delhi.,1994.
6) Kolter Philip,"Marketing Management",Prentice-hall of India,1988.
7) Vyuptakesh Sharan.,"Fundamental of Financial Management", Pearson Education
8) L.C.Jhamb ,"Production(Operation)Management", Everest publishing house .
9) S.M.Inamdar, "Cost and Management Acounting"
10) M.K.Khan &P.K.Jain,"Financial Management", Tata McGraw Hill Publishing Co. New Delhi.
11) J.P.Bose, S.Talukdar, "Business Management", New Central Agencies (P) Ltd.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
T.E. (MECHANICAL)
W.E.F.: 2007-08
TERM-II
Practical Training/ Mini Project/ Special study

Teaching Scheme	Examination Scheme
Practical: 2Hrs/week.	Term Work: 25 Marks

- Every student has to undergo industrial / practical training for a minimum period of two weeks during summer vacations between (S.E Second Term) fourth and (T.E First Term)fifth term or during winter vacation between fifth and sixth term(T.E. First Term and Second Term).

- The industry in which practical training is taken should be a medium or large scale industry

- The paper bound report on training must be submitted by every student in the beginning of (T.E. Second Term) sixth term along with a certificate from the company where the student took training .

- The report on training should be a detailed one.

- Maximum number of students allowed to take training in accompany should be five. Every student should write the report separately.

- In case if a student is not able to undergo practical training , then such student should be asked to

  Prepare special study report on a recent topic from reported literature.

  or

  A mini project related to mechanical branch of engineering.

1. A student must design the model for mini project.

2. The model should be simulated using any of the standard simulation software available.

3. Result verification for paper design an simulation should be carried out and discrepancies should be discussed.

4. Assemble the model. Prepare bill of materials.

5. Project report should be detail of work , carried out by student ,including layouts , models, bill of materials and relevant details.

- The practical training /special study / mini project shall carry a team work of 25 marks. Every student shall be required to present a seminar in the respective class in the presence of two teachers. These teachers (appointed by head of department in consultation with the principal) shall award marks based on the following.

(a) Report	10 marks
(b) Seminar presentation	10 marks
(c) Viva – voca at the time of seminar presentation	05 marks

Total	25 marks

Engineering & Technology Faculty
Equivalence Subject of TE Mechanical Engineering

Sr. No.	Old Subject	Sr. No	New Subject
1	Heat Transfer and Gas Dynamics	**1**	Heat Transfer and Mass Transfer
2	Engineering Metallurgy	**2**	Engineering Metallurgy
3	Machine Design-I	**3**	Machine Design-I
4	Industrial Engineering and Mgt.	**4**	Industrial Engineering of SE (Mech.) New
5	Numerical Analysis and Computational method	**5**	Numerical Analysis and Computational Method
6	Machine Design –II	**6**	Machine Design-II
7	Dynamics of Machinery –II	**7**	Theory of Machine-II
8	Metrology and Quality Control	**8**	Mechanical Measurement and Metrology
9	Manufacturing Technology	**9**	Manufacturing Engineering –II of SE (Mech.) New
10	Turbo Machinery	**10**	Turbo Machinery

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NORTH MAHARASHTRA UNIVERSITY, JALGAON (M.S.)

FINAL YEAR ENGINEERING (B.E.)

(MECHANICAL ENGINEERING)

TERM-I & II

W.E.F.: 2008-09

NORTH MAHARASHTRA UNIVERSITY, JALGAON
STRUCTURE OF TEACHING AND EVALUATION
B.E. (MECHANICAL ENGINEERING)

FIRST TERM **W.E.F. 2008-09**

Sr. No.	Subject	Teaching Scheme Hours/week			Examination Scheme				
		Lectures	Tutorial	Practical	Paper Duration Hours	Paper	TW	PR	OR
1	Refrigeration And Air Conditioning	4	--	2	3	100	25	--	25
2	CAD/CAM	4	--	2	4	100	25	--	25
3	***Mechatronics Systems	4	--	2	3	100	25	--	25
4	Operational Research	4	--	--	3	100	--	--	--
5	Elective – I	4	--	--	3	100	25	--	--
6	***Seminar	--	--	2	--	--	25	--	--
7	***Project	--	--	2	--	--	25	--	25
	Total	**20**	**--**	**10**	**--**	**500**	**150**	**--**	**100**
	Grand Total	**30**			**750**				

*** Common with Production Engineering and Automobile Engineering

SECOND TERM

Sr. No.	Subject	Teaching Scheme Hours/week			Examination Scheme				
		Lectures	Tutorial	Practical	Paper Duration Hours	Paper	TW	PR	OR
1	Finite Element Analysis and Simulation	4	--	4	4	100	25	--	25
2	Mechanical Vibration	4	--	2	3	100	25	--	25
3	Tribology	4	--	2	3	100	25	--	25
4	Elective – II	4	--	--	3	100	25	--	--
5	***Project	--	--	4	--	--	100	--	50
6	***Industrial Visit / Case Study	--	--	--	--	--	25	--	--
	Total	**16**	**--**	**12**		**400**	**225**	**--**	**125**
	Grand Total	**28**			**750**				

*** Common with Production Engineering and Automobile Engineering

Elective-I
1. Energy Conservation and Management
2. Advanced Machine Design
3. Machine Tool Design
4. Product Development And Rapid Prototyping
5. Automobile Engineering
6. Fluid Machinery

Elective-II
1. Power Plant Engineering
2. Process Equipment Design
3. Introduction To Robotics
4. Advanced Welding Technology
5. Energy Engineering
6. Industrial Fluid Power

B.E. (MECHANICAL ENGINEERING): FIRST TERM
REFRIGERATION AND AIR CONDITIONING

Teaching Scheme
Lectures : 4 Hours/week
Practical : 2 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Term Work : 25 Marks
Oral : 25 Marks
Paper Duration : 3 Hours

UNIT - I **10 Hours (20 Marks)**

Introduction, standard rating of refrigerating machine, coefficient of performance of refrigerator and heat pump.
Reversed Carnot cycle and its limitations, reversed Brayton cycle, application to air craft refrigeration, Bootstrap refrigeration cycle, reduced ambient air cooling system, regenerative air cycle system. (Numerical treatment)
Designation of refrigerant, selection of refrigerant, chemical, physical and thermodynamic requirements of refrigerants, lubricant in refrigerating system, secondary refrigerant, azeotropes and its uses.

UNIT - II **10 Hours (20 Marks)**

Vapour compression refrigeration system study of theoretical and actual vapour compression cycle, use of p-h & T-s charts, effect of evaporator and condenser pressure and temperature on the performance of the refrigeration cycle, effect of sub cooling and super heating. (Numerical treatment)
Compound vapour compression system with inter cooling, flash chamber, multi compressor and multi evaporators systems. (Numerical treatment)
Cascade refrigeration system, production of dry ice, Joule Thomson coefficient, and inverse curve, liquefaction of air and gases. (no numerical treatment)

UNIT - III **10 Hours (20 Marks)**

Vapour absorption refrigeration simple & modified vapour absorption refrigeration systems, Electrolux refrigerator.
Desirable properties of solvent, absorbent & refrigerant combinations, aqua ammonia & lithium bromide refrigeration system use of enthalpy concentration charts. (Numerical treatment)

UNIT - IV **10 Hours (20 Marks)**

Psychometric- properties of moist air, psychrometric chart and process, mixing of air stream, bypass factor, sensible heat factor, room sensible heat factor, Gross sensible heat factor, humidifying efficiency, air washer. Study of various types of psychrometers, sling, aspirating, and industrial type. (Numerical treatment)

UNIT - V **10 Hours (20 Marks)**

Introduction to industrial and comfort air conditioning, human requirements of comfort, effective temperature and comfort chart.Air conditioning load calculations, inside and outside design conditions, Building cooling & heating load calculation, Effective sensible heat factor advanced psychrometry. (Numerical treatment)
Window and central air conditioning systems year round air conditioning, Direct and chilled water air conditioning.

TERM WORK

LIST OF PRACTICAL**:** Any eight out of the following to be performed with minimum three trials.
1) Trial on vapour compression refrigeration system.
2) Trial on ice plant/domestic refrigeration system.
3) Study and trial on vapour absorption refrigeration system.
4) Study and trial on window/central air conditioner.
5) Study and trial on heat pump test rig.
6) Study of construction of hermetically sealed compressor and actual viewing of a cut model of the same (reciprocating, rotary and car A/C compressor).
7) Study of evacuation and charging of refrigeration system.
8) Study and trial on cooling towers.
9) Study of expansion devices, solenoid valve and safety devices used in vapor compression system.
10) Study of thermostat and humidistat, dryer, oil separator.
11) Study of measuring instruments and various tools used in refrigeration and air-conditioning systems.

12) Visit to cold storage/ice plant/ central air conditioning system.
13) Cooling load calculation of any laboratory / class room in the institute & suggest the requirement of Air conditioner unit in terms of capacity.

Note: Oral will be based on the prescribed term work presented in the form of certified journal.

REFERENCE BOOKS

1) Arora C. P.," Refrigeration and air conditioning", TMH, New Delhi.
2) Monohar Prasad," Refrigeration and air conditioning", New Age Publishers New Delhi.
3) Ananthnarayanan," Basics of Refrigeration", TMH, and New Delhi.
4) Stocker W. F. and Jones," Refrigeration and air conditioning", McGraw Hill.
5) Dossat," Principles of Refrigeration", John Wiley Inc.
6) Arora and Domkundawar," Refrigeration and air conditioning", Dhanpatrai and sons, New Delhi.
t) Faye C McQuistom,"Heating Ventilatging nad Air conditioning",Wiley India Pvt.Ltd. New Delhi

B.E. (MECHANICAL ENGINEERING): FIRST TERM
CAD/CAM

Teaching Scheme
Lectures : 4 Hours/week
Practical : 2 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Term Work : 25 Marks
Oral : 25 Marks
Paper Duration : 4 Hours

UNIT – I **10 Hours (20 Marks)**

INTRODUCTION TO CAD/CAM AND NETWORKING
Define CAD/CAM, Product Life Cycle & CAD/CAM, Application of Computers for Design Process, Selection of a CAD system, Desirable relationship of CAD/CAM database, Benefits & Application of CAD
Hardware in CAD, Introduction, The Design Work Station, The graphics terminal, Operator input/output devices,
Computer communication,Principle of networking, Classification of network, Transmission media & interface, LAN system.

UNIT – II **10 Hours (20 Marks)**

COMPUTER GRAPHICS
Introduction, Graphic Primitives, Point plotting, Drawing of lines, Co ordinate system used in graphic element, Transformation in graphics, D transformation, Homogeneous transformation, Concatenate co ordinate transformation, Translation, Rotation, Scaling, Mirror, Reflection, Inverse co ordinate transformation, clipping, 3D transformation, Projections, Scan conversion, Rendering, Shaving, View Port, Windowing, Standardization in graphics IGES files

UNIT – III **10 Hours (20 Marks)**

GEOMETRIC MODELING
Requirement of Geometric Modeling, Geometric Model, Geometric Model Construction Method,, Wire Frame Modeling, Surface Modeling, Solid Modeling, Representation of Curve & Surfaces, Design of curve shape, Cubic Spline, Bezier curve, B-spline curve, Nurbs B-spline, Representation of surfaces
AUTOMATION
Concept of Automation, Types of Automation, Advantages & limitations of Automation, Levels of Automation, Advanced Automation Function

UNIT – IV **10 Hours (20 Marks)**

INDUSTRIAL CONTROL SYSTEM
Continuous control system, Discrete control system, Computer process control, Forms of CPC, Computer process Monitoring, Direct Digital Control, Numerical Control & Robotics, Programmable logic controller, Supervisory control, Distributed Control & Personnel Computers
CNC PROGRAMMING
Axis of CNC Machines, Manual Part Programming using G codes, Use of Sub routines, Computer Aided Part Programming using APT or any other language/G- coding /M- coding.

UNIT – V **10 Hours (20 Marks)**

FMS, GT AND ROBOTICS
FMS – Introduction, Components of FMS, Types of FMS, Application & Benefits, Planning & implementation issue, Typical FMS layout.
GT – Part families, Part classification & coding, optic coding system, Multiclass coding system, Application of GT.
Robotics – Robot Anatomy, Robot Control System, End effectors, Sensors, Industrial Robot, Application and its selection.

TERM WORK

List of Practical-
1. Modeling of any three Machine Component *
2. Any Two Assembly of Mechanical Components*
3. Three assignments based on above syllabus

* Modeling & Assembly can be done by using any modeling software

Note: Oral will be based on the prescribed term-work presented in the form of certified journal.

REFERENCES

1) P. Radhkrishnan, S. Subramanyam, V. Raju ,"CAD/CAM/CIM" , New Age Publication
2) Grover, Automation, "Production System and Computer Integrated Manufacturing", Pearson Education.
3) Mikell P. Grover, Emory W. Zimmers ,"Computer Aided Design and Manufacturing", P.H.I
4) Rao, Tiwari, Kundra ,"Computer Aided Manufacturing" ,T.M.H
5) Zeid ,"CAD/CAM" ,T.M.H
6) James G. Keramas ,"Robot Technology Fundamentala", Vikas Publication House
7) B.S.Pabla, M.Adithan ,"CNC Machine ", New Age International(P) Ltd.
8) Rudra Pratap, "Getting Started with Matlab 7", OUP, New Delhi.

B.E. (MECHANICAL ENGINEERING): FIRST TERM
MECHATRONICS SYSTEMS
(Common with Production Engineering and Automobile Engineering)

Teaching Scheme
Lectures : 4 Hours/week
Practical : 2 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Term Work : 25 Marks
Oral : 25 Marks
Paper Duration : 3 Hours

UNIT – I **10 Hours (20 Marks)**

INTRODUCTION TO MECHATRONICS
Scope and importance of mechatronics, Key issue, Systems, Measurement systems.
TRANSDUCERS AND SENSORS
Introduction, Difference between transducer and sensor, Transducer types, Transduction principle, Photoelectric transducers – photoemissive transducers, photoconductive transducers, photovoltaic transducers, Thermistors, Thermodevices, Thermocouple, Inductive transducers, Capacitive transducers, Pyroelectric transducers, Piezoelectric transducer, Half-effect transducer, Ionization transducers, Light Emitting diode, Optical encoder – incremental encoder, absolute optical encoder, Bimetallic strip, Bourdon tube, Strain gauge, Load cell, Diaphragms, Mechanical switches, Flow transducers, Fibre optic transducers.

UNIT – II **10 Hours (20 Marks)**

SIGNAL CONDITIONING
Introduction, Voltage divider, Rectification, Diode voltage stabilizer, Clipping and Clamping circuit, Amplifier – OPANP circuits, more about filter circuits, Isolator, Instrumentation amplifier, Bridge circuit, Comparator, Oscillator, 555 Timer, Sample and Hold, Clock, Analog to Digital conversion – digital to analog converter, counter based analog to digital converter, successive approximation, Galvanometer, Ammeter and Voltmeter, Cathode ray oscilloscope.
DATA PRESENTATION AND DATA LOGGING SYSTEMS
Introduction, Recorders – Graphic recorders, Strip chart recorders, X-Y recorders, Magnetic tape recorder.
Data loggers – block diagram description , Data acquisition system – generalized data acquisition system, computer based data acquisition system.

UNIT – III **10 Hours (20 Marks)**

ACTUATORS AND MECHANISMS
Introduction, Actuator types and application areas, Electromechanical actuators, DC Motors – brushed DC motor, brushless, coreless, AC Motors – induction motors, synchronous motors, stepper motor, Fluid power actuators – pneumatic actuators, valves actuators, hydraulic actuators, comparison, Piezoelectric actuators – an illustration, piezoelectric motor, Magnetostrictive actuators, Memory metal actuators, Ion-exchange polymer metal composites, Chemical actuator.
Mechanisms, Bearings – slide bearing, journal bearing, rolling element bearing, magnetic bearing, molecular bearing, Belt, Chain, Pulleys, Gears – gear ratio, Rack and pinion, Ratchet, Pawl and Crank, Slider and crank, Cam and Follower – shape of the cam, shape of the follower, Chain and Sprocket, Geneva wheel, Four bar linkages.

UNIT – IV **10 Hours (20 Marks)**

INTRODUCTION TO MICROPROCESSORS AND MICROCONTROLLERS
Microprocessor – Introduction, Basic element of control systems
Microcontrollers – Introduction, Difference between Microprocessors and Microcontrollers
Programmable logic controllers – Introduction.
CONTROL SYSTEMS AND CONTROLLERS
Introduction, Control system, Open-loop control systems, Closed-loop control systems – notations, reachability, transfer function.
The Controllers – on-off controller, proportional controller, integral controller, derivative controller, proportional plus integral controller, proportional plus derivative controller, proportional plus integral plus derivative controller, comparison, More about automatic control, Difing automatic control methods.

UNIT – V **10 Hours (20 Marks)**

INTEGRATION

Introduction, Background, Advanced actuators – advanced motorized actuators, pneumatic actuators, servo actuator systems, Consumer mechatronic products, Hydraulic fingers, Surgical equipment, Industrial robot – different parts of a robot, controller, drive, arm, end effector, sensor, functional requirements, robot based automation, Autonomous guided vehicle – AGV architecture, components based DCS view, man machine interface, design with fieldbus technology, Drilling machine, Conveyor based material handling systems – validation, design.

INDUSTRIAL DESIGN, AESTHETICS AND ERGONOMICS

Introduction, Element of product design – product physiogonomy aesthetics, product physiogonomy ergonomics, ergonomics in machine tool design, ergonomics in machine tool safety, product safety audit, Ergonomic factors for advanced manufacturing systems – machine oriented industrial design, factory without people, ergonomic problems in new technology.

TERM WORK

Term work shall consist of any five experiments and three assignments.

1) Study of Basic block diagram of mechatronics system components.
2) Study and demonstration of motion / force transducers.
3) Study and demonstration of temperature / pressure transducers.
4) Study and demonstration of AD / DA converter
5) Study and demonstration of hydraulic actuator / pneumatic actuator.
6) Study and demonstration of graphic / magnetic tape recorders.
7) Study of Microprocessors and Microcontrollers
8) Study of Robot / Autonomous guided vehicle

Note: Oral will be based on the prescribed term-work presented in the form of certified journal.

REFERENCE BOOKS

1)D.R. Appukuttan,"Introduction to Mechatronics", Oxford University Press, New Delhi
2)N.P.Mahalik,"Mehatronics", Tata McGraw-Hill Publishing Company Limited, New Delhi
3) W. Bolton," Mechatronics", Pearson Education, New Delhi
4) Dan Necsulescu , "Mehatronics", Pearson Education, New Delhi
5) R.P. Borole," Mehatronics", Nirali Prakashan, Jalgaon.
6) D. V. Alciatore, "Introduction to Mechatronic and Measurement Systems", Tata McGraw- Hill Publishing Company Limited, New Delhi
7) HMT Limited, "Mechatronics", Tata McGraw-Hill Publishing Company Limited, New Delhi
8) J.G. Joshi, "Mechatronics", Prentice Hall of India, New Delhi
9) A.Smaili, "Applied Mechatronics", Oxford University Press, New Delhi.

B.E. (MECHANICAL ENGINEERING): FIRST TERM
OPERATIONAL RESEARCH

Teaching Scheme
Lectures : 4 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Paper Duration : 3 Hours

UNIT – I **10 Hours (20 Marks)**

Introduction to O.R., Models in O.R., Scope, Phases, O.R. in Decision Making, Linear Programming,-model formulation, Graphical Method, Simplex Method(ONLY THEORY) , Concept of Quality and its application, Sensitive Analysis.

UNIT – II **10 Hours (20 Marks)**

Linear Programming – Simplex Method, Standard Form of an L.P. Problem , Simplex algorithm (Maximization Case), Simplex Algorithm(Minimization Case) Two Phase Method, The Big- M Method.

UNIT – III **10 Hours (20 Marks)**

Dynamic Programming- Introduction, Basic Concepts and Application, Characteristic of D.P., Dynamic Programming Approach.
Special Techniques of L.P. such as Transportation Model, Assignments Model, Traveling Salesman, Transshipments Problem.

UNIT – IV **10 Hours (20 Marks)**

Decision Theory- Decision Trees, Classes of Decision Model, Utility, Decision under Certainty, Uncertainty and Risk.
Games Theory – Theory Concept, Characteristics, Maximum And Minimum Principles, Saddle Point, Dominance Basic Concept and Terminology of Two Person Zero Sum Games, MXZ and ZXN Games, Sub Games Method, Graphical Method.

UNIT – V **10 Hours (20 Marks)**

Job Sequencing – Introduction, Sequencing Algorithm, Processing N Jobs Through Two Machines, Three Machines and M – Machines, two Jobs and M-Machine Graphical Method.
Replacement Models – Introduction, Types of Failure, Replacement of Items whose efficiency deteriorates with time(Model I & II), Replacement of Item that fail suddenly.

RECOMMENDED BOOKS

1) L.C. Jhamb ,"Quantities Techniques" Vol I and II, Everest Publication
2) Hira , Gupta ,"Operation Research "
3) Taha ,"Operation Research"
4) S.D. Sharma, "Operation Research", Khanna Publication
5) Manohar Mahajan, "Operation Research"
6) J.K.Sharma ,"Operation Research, Problem and Solution" , Macmillan
7) N.D.Vohra ,"Quantitative Techniques in Management" ,TATA Mc Graw Hill
8) Ravindran," Operation Research Principles and Practice ",Wiley India Pvt.Ltd. New Delhi

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B.E. (MECHANICAL ENGINEERING): FIRST TERM
ENERGY CONVERSION AND MANAGEMENT
ELECTIVE - I

Teaching Scheme
Lectures : 4 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Term Work : 25 Marks
Paper Duration : 3 Hours

UNIT - I **10 Hours (20 Marks)**

Global and linear market - Energy scenario in various sector and Indian economy. Need and importance of energy conservation and management pay back period. Return on investment (R.O.I.), life cycle cost, sanyes diagrams, specific energy consumption. Load management.

UNIT - II **10 Hours (20 Marks)**

Energy auditing - Methodology, analysis and reporting, portable and on-line instruments. Costing of utilities like steam, compressed air, electricity and water. Energy system modeling analysis general concepts, classification of models and use of digital computers in modeling and analysis.

UNIT - III **10 Hours (20 Marks)**

Steam and condensate systems boilers (including package boilers), efficiency testing, Demand control, power factor improvement its benefit and ways of improvement, load scheduling.
Electric motors, lowers, efficiency, energy efficient types of electrical motors for energy conservation, motor speed control variable speed drive.
Lighting: Illumination level, fixtures, timers, energy efficient illumination.

UNIT - IV **10 Hours (20 Marks)**

Energy conservation compressed air systems, refrigeration and air conditioning systems, and water systems. Elementary converge of energy conversation in pumps and fans co-generation concepts, options (steam/gas turbine/D C T based) selection criterion.

UNIT - V **10 Hours (20 Marks)**

Energy action planning : Key elements, force field analysis, energy policy purpose, perspective contents, formulation, ratification, organizing, location of energy management, top management support, managerial function, roles and responsibilities of energy manager, accountability, motivating – motivation of employees, information system designing barriers, strategies, marketing and communicating, training & planning.

TERM WORK

Term work shall consist minimum eight assignments based on above syllabus.

RECOMEMNDED BOOKS:

1) Prof. Henderson," India the energy sector", oxford university press.
2) L.J. Nagrath ," System modeling and analysis", Tata McGraw Hill Press.
3) D.A.Ray," Industial energy conservation pergamon press".
4) IGC Drydin editor," The efficient use of energy" (butter worths)
5) W.C.Turner editor,"Energy management handbook (Wiley)
6) Patrick Steven R, Patric Dake R, Fordo Stephen,"Energy conservation guidebook". Fairmont press Inc.
7) F. William Payne & Richard E. Thompsion ," Efficient Boiler" Operation Source Book.
8) W.C.Turner editor: energy management handbook (Wiley)

B.E. (MECHANICAL ENGINEERING): FIRST TERM
ADVANCED MACHINE DESIGN
ELECTIVE- I

Teaching Scheme
Lectures : 4 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Term Work : 25 Marks
Paper Duration : 3 Hours

UNIT - I **10 Hours (20 Marks)**

OPTIMUM DESIGN
Introduction to optimum design, Adequate design, Johnson's method of optimum design, Case of normal specifications, Case of redundant specifications, Case of incompatible specifications.

UNIT - II **10 Hours (20 Marks)**

SYSTEM APPROACH
Introduction, System approach to design mathematical model, Dynamic response to a distributed system, Dynamic response to a lumped system, Modelling the elasticities, Modelling the masses, Modelling the inertia, Modelling friction and damping, Mathematical model for shock analysis, Cam system, Value engineering approach to design problem.

UNIT - III **10 Hours (20 Marks)**

CAM:
Introduction, Advance cam curves, Polynomical cam, 3-4-5 polynomoal cam, 4-5-6-7 polynomial cam, Jerk cycloidal cam, Sine acceleration cam, Forces on cam, Mathematical model with elasticity, Jump phenomenon, Ramp of the cam – Precam, Polydyne cam.

UNIT - IV **10 Hours (20 Marks)**

DESIGN OF I.C. ENGINE COMPONENTS
Introduction, Principal part of IC engine, Design of piston, piston rings and piston pin, Design of cylinder and cylinder head, Design of connecting rod, Design of crank shaft, Design of valve gear mechanism.

UNIT - V **10 Hours (20 Marks)**

DESIGN OF HOISTING MECHANISMS
Introduction, Design of hoisting chains and drums, Design of ropes, Design of wire ropes, Stress in curved beams, Design of crank hook.

TERM WORK

Term work shall consist minimum eight assignments based on above syllabus.

REFERENCE BOOKS

1) Dr. Rajendra Karwa ," A text book of Machine Design", Laxmi Publications (P) Ltd, New Delhi
2) J. Uicker,"Theory of Machines and Mechanism", 3ed., Oxford University Press, New Delhi.
3) Farazdak Haideri ," Machine Design", Nirali Prakashan, Jalgaon
4) M.F. Spotts," Design of Machine Elements", Pearson Education
5) N.C.Pandya ," Element of Machine Design", Charotar book stall, Anand
6) Norton ," Dynamics of Machinery", Tata Mc-Graw Hill, New Delhi
7) P.C.Sharma ,"Machine Design", S K Katuria & Sons
8) R. S. Khurmi ," A text book of Machine Design", Eurasis Publishing House Pvt. Ltd, Delhi
9) R.B.Patil ,"Design of Machine Elements", Tech- Max Publications, Pune

B.E. (MECHANICAL ENGINEERING): FIRST TERM
MACHINE TOOL DESIGN
ELECTIVE- I

Teaching Scheme
Lectures : 4 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Term Work : 25 Marks
Paper Duration : 3 Hours

UNIT - I **10 Hours (20 Marks)**

DESIGN OF SPEED AND FEED RATES
Aim of speed and feed rate regulation, Stepped regulation of speed : Design of speed box, Design of feed box, Machine tool drives using multiple speed motors, Special cases of gear box design, General recommendations for developing the gearing diagram, Determining the number of teeth of gears, Classification of speed and feed boxes, Stepless regulation of speed and feed rates.

UNIT- II **10 Hours (20 Marks)**

DESIGN OF MACHINE TOOL STRUCTURES
Functions of Machine tool structures and their requirements, Design criteria for tool structures, Static and dynamic stiffness, Profiles of machine tool structures, Basic design procedure of machine tool structures, Design of beds, Design of columns, Design of housings, Design of bases and tables, Design of cross rails, arms, saddles and carriages, Design of rams.

UNIT - III **10 Hours (20 Marks)**

DESIGN OF GUIDEWAYS AND POWER SCREWS
Functions and types of guideways, Design of slideways, Design criteria and calculations for slideways, Guideways operating under liquid friction conditions, Design of aerostatic slideways, Design of anti-friction guideways, Combination guideways, Protecting devices for slideways, Design of Power screws.

UNIT - IV **10 Hours (20 Marks)**

DESIGN OF SPINDLES AND SPINDLE SUPPORTS
Functions of spindle unit and requirements, Material of spindles, Effect of machine tool compliance on machining accuracy, Design calculations of spindles, Antifriction bearings, Sliding bearings.
DYNAMICS OF MACHINE TOOLS : Machine tool elastic system cutting process closed loop system, General procedure for assessing dynamic stability of EES cutting process closed loop system, Dynamic characteristics of elements and systems, Dynamic characteristic of the equivalent elastic system, Dynamic characteristic of the cutting process, Stability analysis, Forced vibrations of machine tools.

UNIT - V **10 Hours (20 Marks)**

CONTROL SYSTEMS IN MACHINE TOOLS
Functions, Requirements and classification, Control systems for changing speeds and feeds, Control systems for executing forming and auxiliary motions, Manual control systems, Automatic control systems Adaptive control systems.
NUMERICAL CONTROL OF MACHINE TOOLS : Fundamental Concepts, Classification and structure of numerical control systems, Manual part programming, Computer aided part programming

TERM WORK

Term work shall consist minimum eight assignments based on above syllabus.

REFERENCE BOOKS

1) S.K. Basu," Design of Machine Tools"
2) Koenigs, "Berger Principles of Machine Tools "
3) Sen and Bhattacharya," Principles of Machine Tool"
4) N Acherkan, "Machine Tool Design", MIR Publication, Moscow 1973
5) Mehta Machine Tool Design

B.E. (MECHANICAL ENGINEERING): FIRST TERM
PRODUCT DEVELOPMENT AND RAPID PROTOTYPING
ELECTIVE- I

Teaching Scheme
Lectures : 4 Hours/week

Examination Scheme
heory Paper : 100 Marks
Term Work : 25 Marks
Paper Duration : 3 Hours

UNIT – I **10 Hours (20 Marks)**

Product Development history and product development process tool, product development verses design, modern product development theories and methodologist in design. Product development teams, product development planning, technical and business concerns. Understanding customer needs, Establishing product functions. Functionality, augmentation. Aggregation, common basis, functional functional modeling methods.

UNIT – II **10 Hours (20 Marks)**

Product tear down and experimentation, benchmarkting and establishing engineering specification. Product portfolios and portfolio architecture. Tear down process, tear down methods, post teardown reporting, benchmarking approach, support tools, setting specifications, portfolio architecture, types, platform, functional architecting, optimization selection, Product modularity, modular design.

UNIT – III **10 Hours (20 Marks)**

Concepts and Modeling - Generation of concepts, information gathering and brain storming, directed search, morphological analysis, combining solutions. Decision making, estimation of technical feasibility, concept selection process, selection charts, measurement theory, numerical concept scoring, design evaluation scheme, concept embodiment, geometry and layout, system modeling, modeling of product metrics, selection of model by performance specifications, physical prototyping, informal and formal models.

UNIT – IV **10 Hours (20 Marks)**

Rapid Product Development - Product Development: Classical steps of product development, Requirement of New Product development strategies, Critical factors affecting success, The Principle of simultaneous Engineering.
Model: Model classes, Influence of models to speed up product development.
Model making by Rapid prototyping: Definitions of rapid prototyping (RP), Rapid Tooling (RT), Rapid Manufacturing (RM). Relating Rapid prototyping models to product development phases.

UNIT – V **10 Hours (20 Marks)**

Generation of Layer information – description of the geometry by a 3D data record, Data flow, CAD model types.
Rapid prototyping Technologies –
Photo polymerization Stereo lithography (SL), Laser Sintering, Layer Laminate Manufacturing (LLM), Extrusion Processes.
Rapid Prototyping Materials-Photopolymers, SL Resins, Sintering Materials, FDM Materials, LOM Materials.
Rapid Prototyping Industrial Applications.

TERM WORK

Term work shall consist minimum eight assignments based on above syllabus.

REFERENCE

1) Roozenburg, J. Eekels, “Product Design : Fundamentals and Methods NFM”, John Wiley and Sons Ltd.,
2) D.Whitney, “Mechanical Assemblies”, Oxford University Press, New Delhi.
3)Geoftry Boothroyd, “Peter dew Product Design for manufacturing and Assembly”
4) Mike Baxter, “Product Design: A Practical guide to systematic methods of new product development”, Champman and Hall.
5) A. K. Chitale, R. C. Gupta,” Product Design and Manufacturing”, Prentice Hall India
6) John R. Lindbeck,”Product Design and Manufacturing”, Prentice Hall International Editime

7) Kevin Otto, Kristin wood, “Product Design : Techniques in Revenue Engineering and New Product Development”, Pearson Education Inc.
8) Andreas Gebharat, Hanser,” Rapid Prototyping” ,Gardner Publication Inc. Cincinnati.
9) Naber H., Macht M., “Fast Prototype Tools in : Rapid Protyping & Manufacturing”
10) Geuer A. Society of Manufacturing Engineers, Dearborn
11) D. Kochan, “Solid Free from Manufacturing ? Advanced Rapid Prototyipng “, Elsevier Science Publisher, B.V. New York.
12) Roozenburg, J. Eekels, Product Design : Fundamentals and Methods NFM, John Wiley and Sons Ltd.,

B.E. (MECHANICAL ENGINEERING): FIRST TERM
AUTOMOBILE ENGINEERING
ELECTIVE – I

Teaching Scheme
Lectures : 4 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Term Work : 25 Marks
Paper Duration : 3 Hours

UNIT - I **10 Hours (20 Marks)**

Chassis & Breaking System
Classification of Automobile, Layout of Automobile Vehicle , Chassis and Frame , Sub- frame, Articulated Vehicle and Trailers, Breaking Systems- Necessity, requirement of good breaking system, classification, types of breaks- mechanical, hydraulic, pneumatic power break. Brake shoe & lining, brake testers. Brake effectiveness, factors controlling stop of an automobile

UNIT - II **10 Hours (20 Marks)**

Transmission Devices
Clutches:- Requirement of Clutches , Single Plate Clutch, Multiplate, Cone, Centrifugal ,Semi centrifugal ,and Fluid Coupling ,Troubleshooting of Clutches,Gear Box:- Sliding Mesh , Constant Mesh, Synchromesh, Epicyclic Gear Train, Torque Converter , Troubleshooting of Gear Box, Propeller Shaft , Differential Axle.

UNIT - III **10 Hours (20 Marks)**

Suspension and Steering System
Suspension System :- Spring, Types of Spring , Coil and helper spring ,Leaf, Transverse Leaf Spring , Independent suspension, Rubber suspension, Self Leveling suspension ,Pneumatic suspension, Troubleshooting of suspension System.
Steering System :- Function and Geometry, Types of Steering System ,Caster and Camber, Toe-in and Toe-out, Steering Linkage and Gear , Reversible Steering and Power Steering .

UNIT - IV **10 Hours (20 Marks)**

Wheel , Tyres and Tubes
Construction and Types of Wheel , Wheel Dimensions , Types of Tyres , Tyre Properties , Tyre Material , Specification of Tyre Size , Ply Rating , Class Ply, Radial Ply, Consideration in Tread Design , Wheel and Tyre Troubleshooting ,Retreading of Tyre Process, Precautions , Controls, Conventional and Procured retreading processes,Tubes ,Natural Rubber and Butyl Flops, Rims , types and Maintenance.

UNIT - V **10 Hours (20 Marks)**

Automobile Electrical System
Starting system - Introduction, battery, starting motors(self starters)
Charging system - Introduction, generator(dynamo),alternator-(A.C. generator)
Ignition system -Introduction, purpose, requirement, basic, ignition system-battery, magneto, and electronics ignition system, firing order, ignition timing, vacuum controlled distributor, spark plug

TERM WORK

Term work shall consist minimum eight assignments based on above syllabus.

RECOMMENDED BOOKS

1) W.L.Crouse, “Automotive Mechanics”, MaGraw Hill International.
2) G.B.S.Narang ,”Automotive Engineering” , Khanna Publishers.
3) Kripal Singh ,”Automobile Engineering” I & II , Standard Publisher distributors.
4) Heitner ,”Automotive Mechanics” , CBS Publisher distributors.
5) Dr. K.M.Gupta,”Automobile Engineering”, Umesh Publication.
6) R.K.Rajput,” Automobile Engineering”, Laxmi Publication, New Delhi

B.E. (MECHANICAL ENGINEERING): FIRST TERM
FLUID MACHINERY
ELECTIVE- I

Teaching Scheme
Lectures : 4 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Term Work : 25 Marks
Paper Duration : 3 Hours

UNIT - I **10 Hours (20 Marks)**

MOMENTUM EQUATION AND ITS APPLICATION
Impulse momentum principle, fixed and moving flat plates and curved vanes ,series of plates and vanes, Velocity triangles and their analysis, work done, efficiency etc.
HYDRODYNAMIC MACHINES
Classification, General theory, Centrifugal head and fundamental equations, (Eulerean, Degree of reaction etc.) head on machines, various efficiencies, condition for max hyd. Efficiency.

UNIT - II **10 Hours (20 Marks)**

IMPULSE TURBINES
Main components and constructional features of a pelton wheel, velocity diagrams and analysis, Number of buckets, jets, non-dimensional parameters (speed ratio, jet ratio)
REACTION TURBINE
Main components and constructional features draft tube –types, efficiency, limitation to the use of draft tube, cavitations, types of reaction turbines (Francis, Kaplan,Deriaz, reversible.)
Governing mechanisms for Francis, Kaplan turbines, pelton wheels, safety devices of turbines (pressure regulator surge tanks, farebay.)
Types of characteristics curves and related terms (unit quantities.) specific speed and shape of runner. Selection of turbine considering various factors.

UNIT - III **10 Hours (20 Marks)**

HYDRODYNAMIC PUMPS
Components of centrifugal pumps. Its installations. Classifications, various terms associated with centrifugal pump (various head, velocity triangles and there analysis, effect of outlet blade angle.) cavitation, NPSH (Thomas cavitation factor), priming of pumps, installation, and specific speed and pump classification. Performance and characteristic of centrifugal pump. Axial thrust case and maintenance, troubles and remedies.

UNIT - IV **10 Hours (20 Marks)**

APPLICATION OF SIMILARITY AS APPLIED TO TURBINES AND PUMPS
Principals, scale effects.
SPECIAL PUMPS
Jet pump, lift pump, hyram pump, deep well pump, regenerative pump, accumulator, intensifier, screw pump.
FLUID COUPLING AND TORQUE CONVERTERS
Construction, working characteristic curves, applications.

UNIT - V **10 Hours (20 Marks)**

HYDRAULIC SYSTEMS
Study of elements such as pump valves packing, motors, Introduction to elements, hydraulic circuits, pertaining of machine tools, selection of fluids.
PNEUMATIC POWER
Basic principles study of elements used in circuits and control of pneumatic power. Applications in mechanical engineering practice. Comparison of pneumatic and hydraulic systems.

TERM WORK

Term work shall consist minimum eight assignments based on above syllabus.

REFERENCE BOOKS

1) S.Ananthswamy, “Fundamentals on hydraulic machinery” ,United book corporation , Pune.
2) V.P. Vasandani, “Theory of hydraulic machinery”Khanna publishers, Delhi.
3) Dr. J. Lal,” Hydraulic machines “ , Metropolitan Books co. pvt. Ltd. Delhi.
4) S.R.Majumda,r “Oil Hydraulic System”, Tata McGraw Hill.
5) S.R.Majumdar, “Pneumatic System”, Tata McGraw Hill.
6) Agrawal,” Fluid Mechanics and Machinery” , Tata McGraw Hill
7) Hicks,” Pump Operation and maintenance”, Tata McGraw Hill
8) E.D. Shaughnessy, “Introduction to Fluid Mechanics”, Oxford University Press, New Delhi.

B.E. (MECHANICAL ENGINEERING): FIRST TERM
PROJECT I
(Common with Production Engineering and Automobile Engineering)

Teaching scheme
Practical: 2 hrs / week

Examination scheme
Oral: 25 Marks
Term Work: 25 Marks

1. Every student individually or in a group (group size is of 4 students. However, if project complexity demands a maximum group size of 5 students, the committee should be convinced about such complexity and scope of the work.) Shall take a project in the beginning of the (B.E. first Term) seventh term in consultation with the guide and the project must be completed in the (B.E. Second Term) eighth term.

2. The project proposal must be submitted in the institute in the beginning of the (B.E. first Term) seventh term. While submitting project proposal care is to be taken that project will be completed within the available time of two term i.e. 2 Hrs per week for (B.E. first Term) seventh term and 4 Hrs per week for (B.E. Second Term) eighth semester (total time become 12*2 + 12*4 = 72 Hrs per project partner). The final title of the project work should be submitted at the beginning of the (B.E. Second Term) eighth semester.

3. Project title should be precise and clear. Selection and approval of topic:

Topic should be related to real life application in the field of MECHANICAL, AUTOMOBILE AND PRODUCTION ENGINEERING

OR

Investigation of the latest development in a specific field of MECHANICAL, AUTOMOBILE AND PRODUCTION ENGINEERING

OR

The investigation of practical problem in manufacture and / or testing of MECHANICAL, AUTOMOBILE AND PRODUCTION ENGINEERING equipments

OR

The MECHANICAL, AUTOMOBILE AND PRODUCTION ENGINEERING based applications project is preferable.

OR

Software development project related to MECHANICAL, AUTOMOBILE AND PRODUCTION ENGINEERING and Agriculture Engineering with the justification for techniques used / implemented is accepted.

OR

Interdisciplinary projects should be encouraged. The examination will be conducted independently in respective departments.

4. The group should maintain a logbook of activities. It should have entries related to the work done, problems faced, solution evolved etc., duly signed by guide.

5. The group is expected to complete details system design, layout etc. in (B.E. first Term) seventh term, as a part of term work in the form of a joint report. Project report must be submitted in the prescribed format only. No variation in the format will be accepted.

6. One guide will be assigned at the most three project groups.

7. The guides should regularly monitor the progress of the project work.

8. Assessment of the project for award of TW marks shall be done by the guide and a departmental committee (consisting of minimum two teachers with experience more than three years) as per the guidelines given in the following table.

A) ASSESSMENT OF PROJECT I TERMWORK B.E. FIRST TERM

NAME OF THE PROJECT _____

NAME OF THE GUIDE: _____

Sr No	Exam Seat No	Name Of Student Marks	Assessment by guide (70%)					Assessment by Departmental committee (30%)			Grand Total	Out of 25 Marks
			Literature survey	Topic Selection	Documentation	Attendance	Total	Evaluation (10%)	Presntaion (20%)	Total		
			10	05	15	05	35	05	10	15	50	25

Sign of Guide Sign. of Committee Members Sign. Of H. O. D.

9. The guide should be internal examiner for oral examination (If experience is greater than three years).

10. The external examiner should be from the related area of the concerned project. He should have minimum of five Years of experience at degree level / industry.

11 .The evaluations at final oral examination should be done jointly by the internal and external examiners.

B.E. (MECHANICAL ENGINEERING): FIRST TERM
SEMINAR
(Common with Production Engineering and Automobile Engineering)

Teaching scheme:
Practical: 2 hrs / week

Examination scheme:
Term Work : 25 Marks

1. **For seminar every student will individually study a topic assigned to him / her and submit a report and shall deliver a short lecture / Seminar on the topic at the end of term.**
2. **Selection of topic should be done by students in consultation with concerned guide**
    a. Topic should be related to branch but it should be extended part of the branch (latest and advance topic).
    b. The topic should be such that the student can gain latest knowledge. Student should preferably refer at least one research paper

3. **Seminar topic should not be repeated in the department and registration of the same should be done on first come first served basis**
4. **Seminar report should be submitted in paper bound copy prepared with computer typing**
    a. Size of report depends on advancement of topic.
    b. Student should preferably refer minimum 5 reference books / magazines.
    c. Format of content
        i. Introduction.
        ii. Literature survey.
        iii. Theory 1) Implementation 2) Methodology
        3) Application 4) Advantages, Disadvantages.
        iv. Future scope.
        v. Conclusion.

5 ASSESSMENT OF SEMINAR for TERM WORK
Title of seminar: _____
Name of guide: _____

Sr. No.	Exam Seat No.	Name of Student	Assessment by examiners					Grand Total
			Topic Selection	Literature Survey	Report Writing	Depth of understanding	Presentation	
			5	5	5	5	5	25

6. Assessment of Literature survey will be based on
    a. Collection of material regarding history of the topic.
    b. Implementation.
    c. Recent applications.

7. Assessment of Depth of understanding will be based on
    a. Questioning by examiners.
    b. Questioning by students.
    c. What the student understands i.e. conclusion regarding seminar.

8. Assessment of presentation will be based on;
    a. Presentation time (10 minutes)
    b. Presentation covered (full or partial)
    c. Way of presentation
    d. Questioning and answering (5 minutes)

9. Examiners should be a panel of two one of them must be guide. Examiner must have experience at least 3 years. Examiners will be appointed by HOD in consultation with Principal.

B.E. (MECHANICAL ENGINEERING): SECOND TERM
FINITE ELEMENT ANALYSIS AND SIMULATION

Teaching Scheme
Lectures : 4 Hours/week
Practical : 4 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Term Work : 25 Marks
Oral : 25 Marks
Paper Duration : 4 Hours

UNIT - I **10 Hours (20 Marks)**

CONVENTIONAL NUMERICAL METHODS
Finite difference method ,method of least square, ritz method, boundary value problems, displacement methods, equilibrium method, mix method of solid mechanics, fe formulation, variational element,Introduction to FEM ,Discritization going from part to whole approach, Physical problem, mathematical models and finite element solution, FEA as a integral part of CAD.
FINITE ELEMENTS TYPES:One dimensional element such as two nodded & three nodded Spar or truss element. Two and three dimensional elements, triangular, rectangular quadrilateral, sector curved, iso parametric, sub parametric elements, etc.

UNIT - II **10 Hours (20 Marks)**

GENERAL PROCEDURE OF FEM
Discritation, element shape, interpolation function, shape function, element stiffness matrix, global stiffness matrix, application of boundary,FEM Softwares - Preprocessing, processing and post processing
Finite element analysis of 1D problem, bending of beams.Introduction, FEM direct approach elements stiffness, potential energy approach, treatment of boundary conditions, temperature effects.
Torsion of circular shaft, thin valve tubes steady state heat conduction, laminar pipe flow.
TRUSSES:Introduction plane trusses, space trusses.

UNIT - III **10 Hours (20 Marks)**

Finite element analysis for two dimensional problem, single variable problems, mesh generation and imposition, egine value and time dependent problems.
Application of heat transfer, fluid mechanics, solid mechanics, plane elasticity and analysis of structural vibration.
Finite element formation of beams.

UNIT - IV **10 Hours (20 Marks)**

Application of FEA to free vibration of thin plate cylindrical shell, transient heat conduction, shaft , motion of fluid in flexible container, flow of idle fluids, viscous fluids, shape structure.

UNIT - V **10 Hours (20 Marks)**

SIMULATION THEORY AND APPLICATION
System models and studies:- concepts of a system, system environment, stochastic activities, continuous and discrete systems, system modeling, types of models, principles used in modeling, types of system studies.
System simulation:-The techniques of simulation, Monte Carlo method, comparison of simulation and analytical methods, analog computers and methods, hybrid computer, simulators, continuous system simulation languages, system dynamics, growth models, logistic curves, multi segments models, probability concepts in simulation, system simulation, events, representation of time, arrival pattern.

TERM WORK

Any Five practical and three assignments based on above syllabus using analysis software.

Note: Oral will be based on the prescribed term-work presented in the form of certified journal.

RECOMMENDED BOOKS

1) J.N. Reddy, An Introduction to Nonlinear Finite Element Analysis, OUP.
2)C.S.Krishnamoorthy.,Finite element analysis TMH
3) J.N.Reddy, Finite element methods,Mc graw hill publition ltd.
4) Robert Cook ,Concept an application of Finite element analysis
5) Klaus-Jurgen Bhate, finite element analysis , PHI
6) C.S. Desai and J.F.Abel.,Introduction to finite element methods ,CBS
7) Tirapati R. Chandrupatla ,Finite element analysis by, PHI.
8) Geoffery Gordon ,System simulation
9) Narsingh Deo ,System simulation with digital computers
10) Kenneth Lt. Huebner, " The FEM for Engineers ",Wiley India Pvt.Ltd. New Delhi

B.E. (MECHANICAL ENGINEERING): SECOND TERM
MECHANICAL VIBRATION

Teaching Scheme
Lectures : 4 Hours/week
Practical : 2 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Term Work : 25 Marks
Oral : 25 Marks
Paper Duration : 3 Hours

UNIT - I **10 Hours (20 Marks)**

FUNDAMENTAL OF VIBRATIONS
Introduction, Definitions, Vector method of representing harmonic motions, Addition of two simple harmonic motions of the same frequency, Beat phenomenon, Complex method of representing harmonic vibrations, Work done by a harmonic force on a harmonic motion, Fourier series and harmonic analysis.
UNDAMPED FREE VIBRATIONS OF SINGLE DEGREE OF FREEDOM SYSTEMS
Introduction, Derivation of differential equation, Solution of differential equation, Torsional vibrations, Equivalent stiffness of spring combinations, Energy method.

UNIT – II **10 Hours (20 Marks)**

DAMPED FREE VIBRATIONS OF SINGLE DEGREE OF FREEDOM SYSTEMS
Introduction, Different types of dampings, Free vibrations with viscous damping, Logarithmic decrement, Viscous dampers, Dry friction or coulomb damping, Solid or structural damping, Slip or interfacial damping.
FORCED VIBRATIONS OF SINGLE DEGREE OF FREEDOM SYSTEMS
Introduction, Forced vibrations with constant harmonic excitation, Forced vibrations with rotating and reciprocating unbalance, Forced vibrations due to excitation of support, Energy dissipated by damping, Forced vibrations with coulomb damping, Forced vibrations with structural damping, Determination of equivalent viscous damping from frequency response curve, Forced vibrations of a system having non-harmonic excitation, Vibration isolation and transmissibility, Vibration measuring instruments.

UNIT - III **10 Hours (20 Marks)**

TWO DEGREE OF FREEDOM SYSTEMS
Introduction, Principal modes of vibration, Other cases of simple two degree of freedom systems, Combined rectilinear and angular modes, System with damping, Undamped forced vibrations with harmonic excitation, Vibration absorbers.
CRITICAL SPEED OF SHAFT:
Introduction, Critical speed of a light shaft having a single disc without damping, Critical speed of a light shaft having a single disc with damping, Critical speed of a shaft having multiple discs, Secondary critical speed, Critical speed of a light cantilever shaft with a large heavy disc at its end.

UNIT - IV **10 Hours (20 Marks)**

MULTI DEGREE OF FREEDOM SYSTEMS EXACT ANALYSIS
Introduction, Free vibrations equations of motion, Influence coefficients, Generalized coordinates and coordinate coupling, Natural frequencies and mode shapes, Orthogonal properties of normal modes, Model analysis, Forced vibrations by matrix inversion, Torsion vibrations of multi-rotor systems.
MULTI DEGREE OF FREEDOM SYSTEMS NUMERICAL METHODS
Introduction, Rayleigh's method, Dunkerley's method, Stodola's method, Rayleigh-Ritz method, Method of matrix itrrations, Holzer's method.

UNIT - V **10 Hours (20 Marks)**

CONTINUOUS SYSTEMS
Vibrations of strings, Longitudinal vibrations of bars, Torsional vibrations of circular shafts, Lateral vibrations of beams.
TRANSIENT VIBRATIONS
Introduction, Laplace transformation, Response to an impulsive input, Response to a step input, Response to a pulse input, phase plane method, shock spectrum.
NON-LINEAR VIBRATIONS: Introduction, Examples of non-linear systems, Phase plane, Undamped free vibration with non-linear spring forces, Pertubation method, Forced vibration with non-linear spring forces, Self excited vibrations.

TERM WORK

Term work shall consist of any five experiments out of the following and three assignments based above syllabus.

1) To study the torsional vibrations of single rotor system.
2) To study the torsional vibrations of two rotor system.
3) To study damped torsional vibrations of single rotor system.
4) To study undamped free vibrations of a spring.
5) To study the natural vibrations of a spring mass system.
6) To study forced damped vibrations of a spring mass system.
7) To study the forced damped vibrations of simply supported beam.
8) To determine critical speed of a single rotor system.

Note: Oral will be based on the prescribed term-work presented in the form of certified journal.

REFERENCE BOOKS

1) Dilip Kumar Adhwarjee "Theory and Applications of Mechanical Vibrations"Laxmi Puyblications (p) Ltd., New Delhi
2) G.K.Grover "Mechanical Vibrations"New Chand & Bros Roorkee (U.P.)
3) Leonard Meirovitch " Element of Vibration Analysis" Tata McGraw-Hill Publishing Company Limited, New Delhi
4) Singiresu S. Rao " Mechanical Vibrations " Pearson Education Ptd. Ltd., Delhi
5) S. Graham Kelly " Schaum's Out lines Mechanical Vibrations " Tata McGraw-Hill Publishing Company Limited, New Delhi
6) Thompson," Theory of Vibration with Application", Pearson Education
7) V.P.Singh " Mechanical Vibrations " Dhanpat Rai & Co. (P) Ltd., Delhi
8)B.H.Tongue," Principles of Vibration", 2/ed. Oxford University Press, New Delhi.

B.E. (MECHANICAL ENGINEERING): SECOND TERM
TRIBOLOGY

Teaching Scheme
Lectures : 4 Hours/week
Practical : 2 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Term Work : 25 Marks
Oral : 25 Marks
Paper Duration : 3 Hours

UNIT - I **10 Hours (20 Marks)**

Tribology: Introduction, Tribology in design, Tribology in Industry, Economic considerations.
Friction: Introduction, Laws of friction, Kinds of friction, Causes of friction, Friction measurement, stick slip oscillations & its elimination,Wear: Theory of wear, Types of wear, Various factors affecting wear, measurement of wear, wear between solids and flowing liquids, theory of wear.

UNIT - II **10 Hours (20 Marks)**

Lubricants and Lubrication: Lubricant properties – physical and chemical. Lubrication – introduction, basic modes of lubrication. Flow of viscous fluid through rectangular slot.
Hydrostatic bearings: Basic concept, operations, advantages and limitations. Hydrostatic conical and spherical bearings, load carrying capacity and flow of lubricants. Bearing power and film thickness, bearing temperature and power. Compensators and their action. Optimum design step bearing.

UNIT - III **10 Hours (20 Marks)**

Hydrodynamic bearing: Theory of hydrodynamic lubrication, Mechanism of pressure development in oil film. Two Dimensional Reynolds equation, Infinite tapered shoe slider bearings and infinite long journal bearing. Short bearing theory applied to journal bearing.

UNIT - IV **10 Hours (20 Marks)**

Hydrodynamic thrust bearing: Introduction, flat plate thrust bearing, step thrust bearing, tapered land thrust bearing, tilting pad thrust bearing, spring mounted thrust bearing, hydrodynamic pocket thrust bearing.
Friction and power losses in journal bearings: Evaluation of friction loss in concentric & eccentric journal bearing & quantity of oil flow with circumferential groove and hole.

UNIT - V **10 Hours (20 Marks)**

Hydrostatic squeeze film, circular & rectangular plates, impact conditions between lubricated solids, applications to journal bearing,Air lubricated bearings: Tilting pad bearings, magnetic recording disk with flying heads, hydrostatic & hydrodynamic thrust bearing with air lubrications. Lubrication practice, quality control & management – characteristics of lubricating methods, lubricating devices & systems, organizing application charts.

TERMWORK

Assignments Problems on -
Problem in hydrostatic bearing
Problem in hydrodynamic bearing
Reynolds equation
Derivation of squeeze film lubrication on rectangular plate and
Practical On (Any FOUR)
Journal Bearing apparatus.
Tilting pad thrust bearing apparatus
Friction in journal bearing
Break line friction test rig.
Coefficient of friction using pin on disc test rig.

Note: Oral will be based on the prescribed term-work presented in the form of certified journal.

REFERENCE BOOKS

1) B. C. Majumdar “Introduction Tribology and Bearings”, H. Wheeler and Company Pvt. Ltd.
2) Cameron A. “Basic Lubrication Theory , Wiley Eastern Ltd.
3) Fuller D. D., “Theory and Practice of Lubrication for Engineers”. John Wiley and Sons.
4) Halling J. “Principles of Tribology”, McMillan Press Ltd.
5) Hrassan & Powel , “Gas Bearing”.
6) Neale M. J. “Tribology Hand Book”, Butterworths.

B.E. (MECHANICAL ENGINEERING): SECOND TERM
POWER PLANT ENGINEERING
ELECTIVE - II

Teaching Scheme
Lectures : 4 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Term Work : 25 Marks
Paper Duration : 3 Hours

UNIT - I **10 Hours (20 Marks)**

THERMAL POWER PLANT
Introduction, general layout of modern thermal power plant, working of thermal power plant, coal classification, coal handling, coal blending, coal desulphanization, Indian coals, selection of coal for TPP., coal handling, storage, preparation and feeding, ash handling and dust collection, fluidized bed combustion systems, steam turbines, condensers, cooling pond and cooling tower, necessity of feed water treatment, high pressure boilers and importance of water purity, thermodynamic cycles.

UNIT - II **10 Hours (20 Marks)**

HYDROELECTRIC POWER PLANT
Hydrograph, flow duration curve, site selection, classification of HPP, and their field of use, capacity calculation for hydro power, dam, head water control, penstock, water turbines, specific speeds, governors, hydro electric plant auxiliaries, plant layout, automatic and pumped storage , project coasty of hydroelectric plant. advantages of HPP

UNIT - III **10 Hours (20 Marks)**

NUCLEAR AND DIESEL POWER PLANT
Elements of nuclear power plant, nuclear reactor and its types, fuels moderators , coolants, control rod, classification of nuclear power plants, waste disposal, diesel power plant diesel engine performance and operation , plant layout, log sheet, application, selection of engine size

UNIT - IV **10 Hours (20 Marks)**

GAS TURBINE PLANT
Plant layout, method of improving output and performance, fuel and fuel systems, method of testing open and closed cycle plants, operating characteristics, applications, free piston engine plant, limitation and application , combined cycle plants, advantages , need of generation power plant in power systems based load station and peak load station.

UNIT - V **10 Hours (20 Marks)**

MAJOR ELECTRICAL EQUIPMENT IN POWER STATION
Generator and exciters, earthling of power system, power and unit transformer, circuit breakers, protective equipments, control board equipment, elements of instrumentation, plant layout, switch gear for power station auxiliaries, recent developments in methods of power generation, introduction to magneto hydrodynamic, fuel cells , geothermal, solar power, tidal power.

TERM WORK

Term work shall consist minimum eight assignments based on above syllabus.

REFERENCE BOOKS

1) Domkundwar and Arora " Power Plant Engineering", Dhanpat Rai & Sons, New Delhi
2) E.I. Wakil, "Power Plant Engineering", Publications, New Delhi
3) P.K.Nag,"Power Plant Engineering", Tata McGraw Hill, New Delhi
4) R.K.Rajput," Power Plant Engineering", Laxmi Publications, New Delhi

B.E. (MECHANICAL ENGINEERING): SECOND TERM
PROCESS EQUIPMENT DESIGN
ELECTIVE - II

Teaching Scheme
Lectures : 4 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Term Work : 25 Marks
Paper Duration : 3 Hours

UNIT - I **10 Hours (20 Marks)**

PRESSURE VESSELS : Introduction, Operating conditions, Pressure vessel code, Selection of material, Vessel opening at low temperatures, Vessel opening at elevated temperatures, Design conditions and stresses, Design of shell and its components, Supports for vessels, Bracket supports, Leg supports, Skirt supports, Saddle supports, Stress from local loads and thermal gradient, Thermal stresses in cylindrical shell, Fabrication, Inspection and tests.

UNIT - II **10 Hours (20 Marks)**

HIGH PRESSURE VESSELS : Introduction, Constructional features, Material for high pressure vessels, Solid walled vessel, Multi-shell construction, vessel closures, jacket for vessels, STORAGE VESSELS: Introduction, Storage of Fluids, Storage of non-volatile liquids, Storage of volatile liquids, Storage of gases, Design of rectangular tanks, Design of tanks, Nozzles and mountings, Large capacity storage tanks.

UNIT - III **10 Hours (20 Marks)**

REACTION VESSELS : Introduction, Material of construction, Agitators, Types of agitators, Baffling, Power requirements for agitation, Design of agitators system components, Drive for agitators, Classification of reaction vessels, Heating systems, Design considerations,Heat Exchangers: Introduction, Types of heat exchangers, Design of shell and tube heat exchangers.

UNIT - IV **10 Hours (20 Marks)**

EVAPORATORS AND CRYSTALLISERS : Evaporators, Types of evaporators, Entrainment separators, Material of construction, Design considerations, Crystallisers,Distillation And Absorption Towers / Columns:Introduction, Basic features of Towers / Columns, Process engineering data, Towers / columns internals, stresses in columns shell, Determination of shell thickness, Elastic stability under compressive stresses, Allowable deflection, Design and construction features of column internals, Supports for column.

UNIT - V **10 Hours (20 Marks)**

AUXILIARY PROCESS VESSELS
Introduction, Reflux drum, Compressors knock-out drum, Liquid-liquid separators, Vapour/gas liquid separators, Wire mesh mist eliminators, Process Hazard And Safety Measures in Equipment Design:Introduction, Hazards in process industries, Analysis of hazards, Safety measures, Safety measures in equipment design, Pressure relief devices.

TERM WORK

Term work shall consist minimum eight assignments based on above syllabus.

REFERENCE BOOKS

1) B.C. Bhattacharyya ," Chemical Equipment Design", CBS Publishers and Distributors, Delhi
2) E.E. Ludwig"Applied Process Design for Chemical and petrochemical Plants", Gulf Publishing Co.
3) E.E. Ludwig "Applied Process Design for Chemical Plants", Gulf Publishing Co.
4) J.H. Perry ,"Chemical Engineering Handbook"
5) L.E. Brownell ," Process Equipment Design", John Wiley and Sons
6) M.V. Joshi ," Process Equipment Design", Macmillan India Ltd, New Delhi
7) S. D. Dawande ,"Process Equipment Design", Central Techno Publication
8) Babu," Process Plant Simulation", Oxford University Press, New Delhi.

B.E. (MECHANICAL ENGINEERING): SECOND TERM
INTRODUCTION TO ROBOTICS
ELECTIVE - II

Teaching Scheme
Lectures : 4 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Term Work : 25 Marks
Paper Duration : 3 Hours

UNIT - I **10 Hours (20 Marks)**

PLANNER MECHANICS: Advanced synthesis of planner mechanics for ISP and FSP burmester theories and analytical techniques, applications.
MECHANICS DYNAMICS: Newtonian lagrangian techniques, energy methods, spatial mechanisms, axodes, and kinematics of open and closed loop mechanism.

UNIT - II **10 Hours (20 Marks)**

BASIC CONCEPT IN ROBOTICS: automation and robotics, robot anatomy, basic structure of robotics, resolution, accuracy and repeatability, classification and structure of robotics system, point to point and continuous past system, control loop of robotics system.

UNIT - III **10 Hours (20 Marks)**

DRIVES AND CONTROL SYSTEM: Hydraulic, DC servomotors, basic control system, concept and models, control system analysis, robot activation and feedback component, positional and velocity sensors, actuators, power transmission system, robot joint control design. Application of robot in manufacturing.

UNIT - IV **10 Hours (20 Marks)**

END EFFECTORS, SENSORS AND VISION SYSTEMS:
End Effectors Types of end effectors, mechanical grippers, vacuum / magnetic / adhesive grippers, tools as end effectors, Gripper selection and design.
Introduction to Sensors: Need of sensors in a robotic system, selection of sensors, photo sensors, limit switches. Range sensors, proximity sensors, touch / sensors.
VISION SYSTEMS: concept of low level and high-level vision in a robotic system.

UNIT - V **10 Hours (20 Marks)**

ROBOT PROGRAMMING: Methods of robot programming, lead through programming methods, a robot program as a path in space, motion interpolation WAIT, SIGNAL, AND DELAY commands.
ROBOT LANGUAGES: The textural robot languages, generation of robot programming languages, robot language structure, constant, variables and other data objects, motion commands, end effector and sensor commands.

TERM WORK

Term work shall consist minimum eight assignments based on above syllabus.

RECOMMENDED BOOKS

1) Groover," Industrial Robotics", McGraw Hill Publication Co.Ltd..
2) John J. Craig, "Introduction to Robotics Mechanics and Control", Pearson Education Inc.,
3) M.P.Groover,"Industrial Robotics - Technology, Programming and Applications"
4) Niku,"Introduction to Robotics : Analysis System and Application", Pearson Education
5) POVOV , Robotics", Mir Publication Co.Ltd.
6) Robot J.Schilling, " Fundamental of Robotics", Pearson Education
7)Mark W Sping," Robot Modelling And Control ",Wiley India Pvt.Ltd. New Delhi

B.E. (MECHANICAL ENGINEERING): SECOND TERM
ADVANCED WELDING TECHNOLOGY
ELECTIVE-II

Teaching Scheme
Lectures : 4 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Term Work : 25 Marks
Paper Duration : 3 Hours

UNIT - I **10 Hours (20 Marks)**

SOLDERING AND BRAZING
Welding characteristics capillary attraction bond formation, metallurgy of solders, foreign materials in the solders alloy. Designing solder joint. Soldering iron, special soldering technique, thermal free solder, low temperature soldering, high temperature soldering, expanding type solders.
Metallurgical aspects of brazing, Design of joint, brazing fluxes, Method of heating – touch brazing, furnace brazing, induction brazing, Resistance brazing, disphasing, Salt bath brazing, brazing solders, silver solders.

UNIT - II **10 Hours (20 Marks)**

SPECIAL WELDING PROCESSES:
Electron beam welding, plasma arc welding, laser welding, bronze welding, under water welding. Ultrasonic, Diffusion welding, Friction and inertia welding, Forge welding, Expolsive welding, Thermit welding, Atomic hydrogen welding

UNIT - III **10 Hours (20 Marks)**

WELDABILITY OF STEELS:
Plain carbon steels-mild steel, medium carbon steel, high carbon steel, tool steels, low alloy and high alloy steels, stainless steels, Austenitic manganese steels.
WELDABILITY OF ALUMINIUM AND ITS ALLOY:
metallurgical behavior during welding, choice of methods, welding rods, fixtures, methods of welding.
WELDABILITY OF CAST IRON AND CASTING:
Gray cast iron, malleable cast iron spheriodal graphite cast iron, selection of cast iron, electrodes and welding rods-methods of welding.
WELDABILITY OF COPPER AND COPPER ALLOY:
Copper brasses, bronzes, Phospher bronze, aluminium bronze, welding of dissimilar metal joints on copper and copper alloys, methods of welding.

UNIT - IV **10 Hours (20 Marks)**

METULLURGICAL CONCEPT OF WELDABILITY:
Temperature changes in welding concepts of weldability carbon equivalent, cracking of welds, weldability testing, welding metallurgical of dissimilar metals, heat treatments of welds.
HARD FACING:
Types of wear, hard facing metallurgy, preparing hard facing, basic hard facing procedure, spray hard facing, basic treatment weld.

UNIT - V **10 Hours (20 Marks)**

DESIGN AND FABRICATION:
Designing for welding types of joints welds and stress distribution, layer sequences, deposition rates, expansion, contraction and residual stresses in weld structure.
Indian standards for welding electrodes, fluxes and properties, electrode selection.

TERM WORK

Term work shall consist minimum eight assignments based on above syllabus.

REFERENCE BOOKS

1) M. Lal , “Fabrication Technology”
2) O. P. Khanna , “Welding Technology”, Dhanpat Rai Publications
3) P.C. Sharma ,” Production Engineering”
4) P. N. Rao , “Manufacturing Tech”. Vol I & II
5) R. K. Jain , “Production Technology”

B.E. (MECHANICAL ENGINEERING): SECOND TERM
ENERGY ENGINEERING
ELECTIVE- II

Teaching Scheme
Lectures : 4 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Term Work : 25 Marks
Paper Duration : 3 Hours

UNIT – I **10 Hours (20 Marks)**

INTRODUCTION:Global primary energy reserves, energy needs of growing economy, Indian energy scenario, energy pricing in India, energy conservation and its importance, energy conservation act-2001 and its features, energy management strategy, energy audit: types and methodology, energy audit reporting format

UNIT - II **10 Hours (20 Marks)**

SOLAR ENERGYsolar radiation, measurement of solar radiation, energy potential of sun, simple flat plate collector, design of liquid flat plate collector, application of liquid flat plate collector, performance analysis, testing procedure of liquid, air, water, FPC.Concentrating Collectors: types, material of construction parameters characterizing, the concentrators, thermodynamic limits on concentration, tracking, performance analysis of cylindrical parabolic & dish collector. Comparison with FPC.

UNIT - III **10 Hours (20 Marks)**

APPLICATION OF SOLAR SYSTEMS AND ECONOMICS ANALYSIS:
Solar ponds, solar distillatory, solar satellite power system, solar cooker, solar air & water heaters, solar dryers, photovoltaic direct energy conversion, solar cells, solar thermal power system, Solar passive heating, solar air-conditioning, solar energy storage's. Economics analysis of solar systems, net present value concept, calculation of pay back periods for solar system.

UNIT - IV **10 Hours (20 Marks)**

WIND ENERGY:Nature of wind, wind machines, classification & description, wind data and its representation, energy in wind, wind mill site characteristic , performance calculations, recent development.
BIOMASS ENERGY:Various forms of biomass energy as a potential energy source, various species of plants suitable for India, bio-fuel production processes, bio-gas plants gasifiers principle, bio-gas & plants, types of gober gas plants.

UNIT - V **10 Hours (20 Marks)**

OCEAN ENERGY:Types of ocean energy sources, ocean temperature difference, OTEC cycle (open and closed) comparison with normal vapor cycle.Ocean Waves: Wave motion energy, power from wave, wave energy conversion devices.Geothermal Energy:History, Future origin, types of geothermal energy, dry rock & hot aquifer analysis, vapour dominated geothermal systems, operational & environmental problems.

TERM WORK
Term work shall consist minimum eight assignments based on above syllabus.

RECOMMENDED BOOKS

1) B.S.Magal, "Solar Power Engineering"
2) G.D. Rai.,Non Conventional Energy Sources
3) Garg H.P.,Treatise on solar Energy Vol. I, II, III
4) John W. Twidell and Anthony D. Weir ,Renewable Energy Resources, ELBS Publication
5) J.A. Duffy, W.A. Beckman- John Willy, Solar Energy of Thermal Processes-
6) Krieth, Krieder ,Principles of solar Engineering ,Mc Graw Hill Pub. Co.
7) S.Rao & B.B.Parulekar, Energy Technology, TMT, New Delhi
8) S.P. Sukhatme ,Solar Energy, Principles of collection and storages , Tata McHill Publication, New Delhi
9) W.C. Turner.,Energy Management Hand Book
10) S.N. Bhadra, Wind Electrical Systems, Oxford University Press, New Delhi.

B.E. (MECHANICAL ENGINEERING): SECOND TERM
INDUSTRIAL FLUID POWER
ELECTIVE- II

Teaching Scheme
Lectures : 4 Hours/week

Examination Scheme
Theory Paper : 100 Marks
Term Work : 25 Marks
Paper Duration : 3 Hours

UNIT - I **10 Hours (20 Marks)**

Fluid power system: Component advantages, application in the field of machine tool, material handling. Hydraulic pressing, mobile and stationary machine clamping, devices etc. Transmission of power at static and dynamic states.
Laws of fluid flow, type of flow,Types of hydraulic fluids, petroleum base, synthetic, and water based. Properties of fluid, selection of fluids, additives, effect of temperature and pressure on hydraulic fluid.

UNIT - II **10 Hours (20 Marks)**

Seals, seating material, compatibility of seal with fluid, Types of pipes, hoses, material, quick acting couplings, presser drop in hosses/pipes, Fluid conditioning through filters, strainers, source of contamination, and contamination control, heat exchangers,Pumps - Types, classification, principal of working, power calculations, efficiency calculation, characteristic curves, selection of pump for hydraulic power transmission form vane pump, gear pump, redial and axial plunger pumps, screw pumps.

UNIT - III **10 Hours (20 Marks)**

Manually operated, solenoid operated, pilot operated. Directional control valve , check valve, Modular construction of valve.
Control of fluid power,Necessity of fluid control through pressure control, direction, control, flow control valves,Principle of pressure control valves, direct operated, pitol operated, relief valves, pressure reducing valve, sequence valve, quick exhaust valve,Principle of flow control valve- Pressure compensated, temperature compensated flow control valve, meter in circuit, meter out circuit, flow through restrictor, Types of direction control valves: Two way two position, four way three position, four way two piston valves, Open center, close center, Tandem center, position of valve

UNIT - IV **10 Hours (20 Marks)**

Actuators - linear and rotary, Symbols of hydraulic circuits, Hydraulic motors gear type vane type piston type radial piston type methods of control of acceleration and deceleration, Types of cylinder mountings, Calculation of piston velocity and thrust under static and dynamic application considering friction inertia loads, Design consideration for cylinders, Selection of components and design of hydraulic circuits for linear circuits regeneration circuits sequencing circuits with the use of electrical control, Laden diagram, Maintenance trouble shooting safety precaution of hydraulic circuits

UNIT – V **10 Hours (20 Marks)**

JIC symbols/ISO pneumatic symbol, Principle of pneumatic, Laws of compression , types of compression, selection of compression, Comparison of pneumatic with hydraulic power transmission, Types of filters regulators , lubrication, mufflers, driers, Pressure regulating valve, Direction control valve two-way three way four way valve solenoid operated valve push button level control valve,Speed regulating methods in pneumatic, Pneumatic actuators, rotary and reciprocating,Air motors radial piston vane type axial piston type,Basic pneumatic circuits, Selection of components for linear circuits sequencing circuits

TERM WORK

Term work shall consist minimum eight assignments based on above syllabus.

RECOMMENDED BOOKS

1) A.Esposito"Fluid Power with Application" Prencice Hall.
2) B. Lall ,"Oil Hydraulics"International Literature Association
3) D.A. Pease ," Basic fluid power " Prentice Hall
4) Godwin ," Power Hydraulics " Cleaver Hume.

5) H.L. Stewart ," Hydraulics and Pneumatics" Industrial Press
6) J.J. Pippenger ,"Industrial Hydraulics "McGraw Hill Co.
7) Vickers' manual on Industrial Hydraulics.
8) Yeaple ,"Fluid Power Design Handbook."
9)E.J.Shaughnessy, "Introduction to Fluid Mechanics" (SI Adoption),OUP, New Delhi.

B.E. (MECHANICAL ENGINEERING): FIRST TERM
PROJECT II
(Common with Production Engineering and Automobile Engineering)

Teaching scheme:
Practical : 4 hrs / week

Examination scheme:
Oral : 50 Marks
Term Work : 100 Marks

1. The Project group in (B.E. first Term) seventh term will continue the project work in (B.E. Second Term) eighth term and complete project in all respect (assembly, testing, fabrication, tabulation, test result etc.)
2. The group should maintain a logbook of activities. It should have entries related to the work done, problems faced, solution evolved etc., duly signed by guide.
3. The guides should regularly monitor the progress of the project work.
4. The project work along with project report should be submitted as part of term work in (B.E. Second Term) eighth term on or before the last day of the (B.E. Second Term) eighth term
5. Project report must be submitted in the prescribed format only. No variation in the format will be accepted.
6. Assessment of the project for award of TW marks shall be done by the guide and a departmental committee (consisting of minimum two teachers with experience more than three years) as per the guidelines given in the following table.

B) ASSESSMENT OF PROJECT II TERMWORK (B.E. SECOND TERM)

NAME OF THE PROJECT: _____

NAME OF THE GUIDE: _____

Sr. No	Exam. Seat No	Name Of Students	Assessment by guide (70%)						Assessment by department (30%)			Grand Total
			Fabrication /software / actual work	Execution of project	Project report	Scope/ Cost / Utility	Attende-nece	Total	Evaluation (10%)	Prese-ntaion (20%)	Total	
		Marks	20	10	20	10	10	70	10	20	30	100

Sign of Guide Sign. of Committee Members Sign. of H. O. D.

7. The guide should be internal examiner for oral examination (If experience is greater than three years).
8. The external examiner should be from the related area of the concerned project. He should have minimum of five years of experience at degree level / industry.
9. The evaluation at final oral examination should be done jointly by the internal and external examiners.

NORTH MAHARASHTRA UNIVERSITY JALGAON

B.E. (Common Automobile Engineering and Production Engineering)

W.E.F : 2008- 09

TERM - II

INDUSTRIAL VISIT / CASE STUDY

Teaching scheme: **Examination scheme:**

NIL **Term Work : 25 Marks**

EDUCATION TOUR / TECHNICAL VISITS / CASE STUDY AND ITS EVALUATION

1. During (B.E. First Term / Second Term) seventh and / or eighth terms or during vacation between (B.E. First Term / Second Term) seventh and eighth terms, every student; shall visit minimum two industries, factories arranged by colleges and accompanied by teachers. There shall be at least one teacher for a group of 20 students and at least one non-teaching staff accompanied with the students.

2. The colleges should obtain appropriate certificates of visit from the concerned organizations just after the visits.

3. Students should submit written report about the visits individually at the end of (B.E. Second Term) eighth term.

4. The report should contain information about the following points:

   (a) The organization - activities of organization and administrative setup technical personnel and their main duties.
   (b) The project / industry brief description with sketches and salient technical information.
   (c) The work / processes observed with specification of materials, products, equipments etc. and role of engineers in that organization.
   (d) Suggestions (if any) for improvement in the working of those organizations.

5. The evaluation of the report of technical visits will be made by panel of two teachers appointed by principal based on following points:

   (a) Coverage aspect: All above points should be covered.
   (b) Detailed observations: System / Process / Product explained with data, diagram specifications.
   (c) Quality of presentation: Report should be very objective and should consist of clear and systematic organization of topics and information.
   (d) Viva - voce: A viva -voce shall be conducted on the technical visit report by the teachers to assess the specific knowledge gained by the students for technical applications.

6. The case study should include the study problem in Mechanical Engineering, Automobile Engineering and Production branch.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
ENGINEERING AND TECHNOLOGY FACULTY
Equivalent Subjects of B.E. Mechanical Engineering

FIRST TERM

S.N.	Old Subjects	S.N.	Equivalent Subjects	Year
1	Machine Design –III	1	--	--
2	Refrigeration And Air Conditioning	2	Refrigeration And Air Conditioning	B.E.Mech (New)
3	Project and Financial Management	3	--	--
4	Elective – I	4	Elective – I	
	1. Non-conventional Energy Sources		1. --	--
	2. Machine Tool Design		2. Machine Tool Design	B.E.Mech – Elective-I (New)
	3. Operation Research		3. --	--
	4. Robotics		4. --	--
	5. Automobile Engineering-I		5. --	--
	6. Mechanical Estimation and Costing		6. --	--
	7. Reliability Engineering		7. --	--

SECOND TERM

S.N.	Old Subjects	S.N.	Equivalent Subjects	Year
1	CAD/CAM	1	--	--
2	Tribology	2	Tribology	B.E.Mech (New)
3	Mechanical Vibration	3	Mechanical Vibration	B.E.Mech (New)
4	Elective - II	4	Elective - II	
	1. Power Plant Engineering		1. Power Plant Engineering	B.E.Mech – Elective-II (New)
	2. Management Information system		2. --	--
	3. Materials Management		3. --	--
	4. Energy Conservation and Management		4. --	--
	5. Automobile Engineering-II		5. --	--
	6. Production Planning and Control		6. --	--
	7. Analysis and Synthesis of Mechanism		7. --	--

2011

North Maharashtra University, Jalgaon

FACULTY OF COMMERCE & MANAGEMENT

Syllabus of Master in Business Administration (MBA)

SEMESTER: I

W.E.From 2011

North Maharashtra University, Jalgaon

(NACC Accredited 'B' Grade University)

FACULTY OF COMMERCE & MANAGEMENT

STRUCTURE OF MASTER IN BUSINESS ADMINISTRATION (M.B.A.)

Semester-I and II			
Paper	**Semester-I**	**Paper**	**Semester-II**
101	Management Science	201	Management Practices
102	Accountancy For Managers	202	Business Research Methods
103	Managerial Economics	203	Global Economic Scenario
104	Information Technology For Managers	204	Management Information System and ERP
105	Introduction To Operations Management	205	Financial Management
106	Organizational Behavior	206	Human Resource Management
107	Corporate Social Responsibility	207	Marketing Management
108	Corporate Communication Skills	208	Quantitative Techniques

Semester-III and IV			
Paper	**Semester-III**	**Paper**	**Semester-IV**
301	Strategic Management	401	e-Commerce & Excellence Management
302	Entrepreneurship & Project Management	402	Family Business Management
303	Legal Aspects Of Business	403	Indian Commercial Laws
304	Specialization-I (Major)*	404	Specialization-V (Major)*
305	Specialization-II (Major)*	405	Specialization-VI (Major)*
306	Specialization-III (Major)*	406	Specialization-VII (Major)*
307	Specialization-IV (Major)*	407	Project Report & Viva-Voce*
308	Specialization (Minor-I)**	408	Specialization (Minor-II)**

*Specialization In Major Subjects (Any One)		**Specialization In Minor Subjects (Any One)	
A	Financial Management	A	Financial Management
B	Marketing Management	B	Marketing Management
C	Human Resource Management	C	Human Resource Management
D	Operations Management	D	Operations Management
E	International Business Management	E	International Business Management
F	Agro Business Management	F	Agro Business Management
G	Systems Management	G	Systems Management

North Maharashtra University, Jalgaon

(NACC Accredited 'B' Grade University)

FACULTY OF COMMERCE & MANAGEMENT

STRUCTURE OF MASTER IN BUSINESS ADMINISTRATION (M.B.A.)

Semester-I and II

Paper	Semester-I	Maximum marks			Paper	Semester-II	Maximum marks		
		Int.	Ext.	Total			Int.	Ext.	Total
101	Management Science	40	60	100	201	Management Practices	40	60	100
102	Accountancy For Managers	40	60	100	202	Business Research Methods	40	60	100
103	Managerial Economics	40	60	100	203	Global Economic Scenario	40	60	100
104	Information Technology For Managers	40	60	100	204	Management Information System and ERP	40	60	100
105	Introduction To Operations Management	40	60	100	205	Financial Management	40	60	100
106	Organizational Behavior	40	60	100	206	Human Resource Management	40	60	100
107	Corporate Social Responsibility	40	60	100	207	Marketing Management	40	60	100
108	Corporate Communication Skills	40	60	100	208	Quantitative Techniques	40	60	100
Total Maximum Marks		**320**	**480**	**800**	**Total Maximum Marks**		**320**	**480**	**800**

Semester-III and IV

Paper	Semester-III	Maximum marks			Paper	Semester-IV	Maximum marks		
		Int.	Ext.	Total			Int.	Ext.	Total
301	Strategic Management	40	60	100	401	e-Commerce & Excellence Management	40	60	100
302	Entrepreneurship & Project Management	40	60	100	402	Family Business Management	40	60	100
303	Legal Aspects Of Business	40	60	100	403	Indian Commercial Laws	40	60	100
304	Specialization-I (Major)*	40	60	100	404	Specialization-V (Major)*	40	60	100
305	Specialization-II (Major)*	40	60	100	405	Specialization-VI (Major)*	40	60	100
306	Specialization-III (Major)*	40	60	100	406	Specialization-VII (Major)*	40	60	100
307	Specialization-IV (Major)*	40	60	100	407	Project Report & Viva-Voce*	40	60	100
308	Specialization (Minor-I)**	40	60	100	408	Specialization (Minor-II)**	40	60	100
Total Maximum Marks		**320**	**480**	**800**	**Total Maximum Marks**		**320**	**480**	**800**

North Maharashtra University, Jalgaon

(NACC Accredited 'B' Grade University)

FACULTY OF COMMERCE & MANAGEMENT

STRUCTURE OF MASTER IN BUSINESS ADMINISTRATION (M.B.A.)

1. TITLE OF THE DEGREE

This degree shall be titled as Master in Business Administration (MBA) with the mention of Major Specialization in the bracket as "MBA (Major specialization)". This new curricula shall be effective from July 2009.

2. DURATION

The regular Full Time Course shall be of 2 Years duration; comprising of 4 Semesters through Theory papers, Sessional, Practical, Project report, Viva-voce, and such other Continuous Evaluation Systems as may be prescribed, in this respect, from time to time.

3. ELIGIBILITY FOR ADMISSION

As per admission rule framed by the Directorate of Technical Education, Government of Maharashtra.

4. PATTERN

3.1. The suggested curriculum comprises 32 papers. Similarly there shall be 10 functional elective papers as below :

Major specialization: 8 papers of Major functional elective, of which for 1 paper the student has to undergo Summer Internship Project for minimum period of 7 weeks.

Minor specialization: 2 papers as a Minor specialization from the list other than opted for Major specialization.

The student has to opt for one specialization as Major specialization comprising 8 papers and another specialization (other than the Major Specialization subject selected) as Minor specialization, comprising 2 papers, from the specified list of subjects for Major / Minor specialization, for IIIrd and IVth semester.

3.2. Each semester will have 8 papers of 100 marks each, thus comprising 3200 marks for the Degree.

3.3. The external assessment shall be based on external written examination to be conducted by the university at the end of the each semester.

3.4. The student shall not be allowed to appear for the semester examination unless the Head/Director of the University Department/Institution certifies completion of internal work, regularity, practical etc. The institution / University Department shall submit alongwith this certificate Internal marks to the COE of the University.

3.5. CGPA system as devised by the University shall be applicable.

3.6. Continuous evaluation of the students shall comprise the 60+40 pattern; where every paper of 100 marks, shall be divided as External evaluation of 60 marks and Internal continuous assessment of 40 marks.

3.7. Continuous Internal assessment may comprises-

3.5.1. Two Class tests of 10 Marks each – Total 20 Marks

3.5.2. 15 Marks for Classroom Paper Presentation, Research Paper Presentations at State Seminars, Research Paper Presentations at National Seminars, Publications in Journals, Practicals (Computer related courses), Presentations of Case Study, Group Discussions, Book Review, Survey etc. in related subjects (atleast THREE activities have to be completed by the student per semester per paper to be supervised and guided by the concerned teacher).

3.5.3. 5 Marks for Active participation in Event Management, Industrial Visit, Placement Activities, Institutional Branding Activities.

5. PASSING STANDARDS

5.1. In order to pass the examination the candidate has to obtain 50% marks in aggregate & at least 40% marks for each head separately, that is 24 marks out of 60 (External) & 16 marks out of 40 marks (Internal) for all courses.

5.2. The student shall be allowed to keep the terms of the next year as per the University rules.

6. GUIDELINES FOR TEACHING

6.1. There shall be atleast 50 lecture hours per semester per course. The duration of the lectures shall be 60 minutes each. There shall be atleast 14-16 weeks of teaching before commencement of examination of respective semester.

6.2. There shall be 4 lectures / week / paper.

6.3. The semester workload is balanced with 8 full papers of 100 marks each / semester. Thus 400 lectures hours are considered for teaching sessions and 50 lecture / sessions shall be used for continuous assessment.

6.4. Self study shall be natural requirement beside the time table. The Faculty will have to exert a little extra for cultivating reading habits amongst the students.

6.5. The teaching method shall comprise a mix of Lectures, Seminars, Group discussions, Brain storming, Game playing, Interactions with Executives etc. so as to prepare the students to face the global challenges as business executive for this Audio-visual aids and Practical field work should be a major source of acquiring knowledge.

6.6. Case study method preferably shall be used wherever possible for the better understanding of the students.

6.7. Each institute shall issue annual souvenir as well as a placement brochure separately to each student and a copy of the same shall be submitted to the university before the end of the year.

7. PRACTICAL TRAINING AND SUMMER INTERNSHIP PROJECT

7.1. Each student shall have to undergo a practical training for a period of not less than 7 weeks during vacation falling after the end of first year.

7.2. In the Fourth semester examination student were to do "Project Work" individually on the basis of Major specialization. No group work is allowed in this. The topic should be decided with consultation and guidance of internal teacher of the Institute at the end of the first year, so that the student can take up the training during the vacations. The Project should be necessarily Research oriented, Innovative and Problem solving. No teacher shall be entrusted with more than 15 students for guidance and supervision.

7.3. The departments / institute shall submit the detailed list of candidate with Project Titles, name of the organization, internal guide & functional elective to the university on or before 31st July of the second year.

7.4. The student has to write a report based on the actual training undergone during the vacations at the specific selected business enterprise, get it certified by the concerned teacher that the Project report has been satisfactorily completed and submit Two typed copies of the same to the Head / Director of the institute.

7.5. Student may use SPSS software if required.

7.6. The student shall submit Synopsis of Project duly signed by Project guide to concerned head. The Head has to forward the Synopsis by e-mail only to external supervisor appointed by University.

7.7. Project details should be displayed on institutes websites

7.8. Project viva shall be conducted at the beginning of Semester IV

7.9. One of the reports submitted by the student shall be forwarded to the University by the Institute before 31st December.

7.10. Viva Voce for one student shall be of minimum 20 minutes. The Student has to prepare PowerPoint presentation based on Project work to be presented at the time of Viva voce.

7.11. 10 % of the projects May be given by institute to the students for summer training as basic research projects.

7.12. The project work will carry maximum 100 marks, of which internal teacher shall award marks out of maximum 40 marks on the basis of project work done by the student as a continuous assessment. Remaining marks shall be awarded out of maximum 60 marks by examining the student during Viva-voce, by the panel of the external examiners to be appointed by the University.

7.13. No students will be permitted to appear for Viva-voce and Semester IV examinations, unless and until (s) he submits the project report before the stipulated time.

8. ADDITIONAL MAJOR SPECIALIZATION

8.1. The student who has passed MBA of this University with a specific Major specialization may be allowed to appear for MBA examination again, with other Major specialization by keeping term for the IIIrd and IVth semester for the so opted 8 papers of additional Major specialization. He has to appear for 8 papers including Project report of the additional Major specialization so opted.

8.2. He shall be given exemption for all other papers including Minor specialization.

8.3. The student has to pay only Tuition fees for one year as may be prescribed from time to time for this purpose.

8.4. The student is not entitled to receive separate Degree Certificate or Class for this additional Major specialization.

9. STRUCTURE OF THE QUESTION PAPER

9.1. Each question paper shall be of 60 marks and of 3 hours duration.

9.2. **For Theory papers** there will be 2 Sections. In section I a candidate shall be required to answer 3 questions out of 5 questions & in section II (s)he shall be required to answer 2 questions out of 3 questions. All questions shall carry equal marks i.e. 12 marks each.

9.3. **For Composite papers (theory and practical / problems)** there will be 2 sections. In section I (practical/problem) a student shall be required to answer 3 questions out of 5 questions & in section II (Theory) (s)he shall be required to answer 2 questions out of 3 questions. All questions shall carry equal marks i.e. 12 marks each.

9.4. **For papers including case studies** there shall be 2 Sections. In Section I (Theory) a student shall be required to answer 3 questions out of 5 questions & in Section II (Case studies) 2 case Studies out of 3 case studies to be attempted by the students. All questions shall carry equal marks i.e. 12 marks each.

9.5. **For case studies (Specialization)** out of 5 cases 3 cases should be attempted by the student. Each case shall carry 20 marks.

10. ELIGIBILITY OF THE FACULTY

As per norms fixed by AICTE and North Maharashtra University.

North Maharashtra University, Jalgaon

(NACC Accredited 'B' Grade University)

FACULTY OF COMMERCE & MANAGEMENT

EQUIVALENCE OF OLD AND NEW COURCES FOR MASTER IN BUSINESS ADMINISTRATION (M.B.A.)

Old Paper	Old courses (w.e.f.- July 1998)	New Paper	New courses (w.e.f.- July 2009-10)
Semester-I			
			Credit Courses : Semester-I
101	Management Science-I	101	Management Science
102	Management Accounting -I	102	Accounting for Managers
103	Managerial Economic Analysis -I	103	Managerial Economics
105	Computer Applications -I	104	Information Technology for Managers
205	Operations & Material Management	105	Introduction To Operations Management
107	Organizational Behavior-I	106	Organizational Behavior
207	Organizational Behavior-II	107	Corporate Social Responsibility
104	Communication Skills	108	Corporate Communication Skills
Semester - II			
			Credit Courses : Semester-II
201	Management Science-II	201	Management Practices
204	Research Methodology Business Ethics & Professional Values	202	Business Research Methods
203	Managerial Economic Analysis -II	203	Global Economic Scenario
302	Information System for Management	204	Management Information System and ERP
202	Management Accounting -II	205	Financial Management
304	Human Resource Management	206	Human Resource Management
206	Marketing Management	207	Marketing Management
106	Quantitative Techniques for Management	208	Quantitative Techniques
Semester - III			
402	Corporate Planning & Strategic Management	301	Strategic Management
301	Computer Application -II	302	e-Commerce & Excellence Management
303	Business Regulatory System-I	303	Legal Aspects of Business
305	Specialization-I	304	Specialization-I (Major)*
306	Specialization-II	305	Specialization-II (Major)*
307	Specialization-III	306	Specialization-III (Major)*
405	Specialization-IV	307	Specialization-IV (Major)*
		308	Specialization (Minor-I)**
Semester - IV			
404	International Business Environment	401	Family Business Management
401	Business & Government	402	Entrepreneurship & Project Management
403	Business Regulatory System-II	403	Indian Commercial Laws
406	Functional Elective -V	404	Specialization-V (Major)*
		405	Specialization-VI (Major)*
		406	Specialization-VII (Major)*
407	Project Report & Viva-Voce	407	Project Report & Viva-Voce*
		408	Specialization (Minor-II)**

North Maharashtra University, Jalgaon

(NACC Accredited 'B' Grade University)

FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: I

Paper: 101: Management Science

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. **Nature & Development of Management** (6)
    a. Management : Concept, Nature, Importance
    b. Management : Art and Science & as a Profession, Management Vs Administration
    c. Evolution of Management: Introduction to Scientific Management by Taylor, Administrative Management by Fayol, Contribution of Peter Drucker, Decision Theory Approach, Contingency Approach, Human behavior Approach,
2. **Functions of Management –I** (8)
    a. Functions of Management, Levels of Management & their respective Functions, Managerial Skills & roles, Managerial Functions in MNC's
    b. Planning: Nature, Scope, Objective and Significances of Planning, Key factors to planning, Types of Plans, Process of Planning, Effective planning-Principles, Barriers & How to overcome barriers, Planning Premises and Forecasting.
    c. Decision Making – Types of Decision , decision making processes, Individual Vs Group decision making, Information Technology & Decision Making (attributes of useful information, information sharing)
3. **Management Functions - II** (7)
    a. Organizing: Concept, Organization Theories, Designing Organization Structure, Forms of Organizational Structure, Departmentation- need, importance & bases of Departmentation, Span of Control - Determination of factors affecting Span of Control, Delegation of Authority, Authority & Responsibility, Line & Staff, and Formal & Informal Organization.
    b. Staffing: Concept, Manpower Planning.
    c. Directing: Concept, Direction and Supervision, Importance of Directing, Principles of Directing.
4. **Management Functions - III** (7)
    a. Coordination – Need & Importance, Coordination & Cooperation, Techniques of Effective coordination.
    b. Controlling : Concept, Types of control, Method : Pre-control - Concurrent control - Post control, an Integrated Control System, Concept of Quality, Factors affecting Quality, Developing a Quality Control system - Pre-control of inputs, Concurrent control of operations, Post control of outputs.

5. **Re-engineering Organizations and Teams** (4)
    a. Re-inventing the organization -Meaning and Concept, Intrapreneurship.
    b. Making Teams Effective- focusing on performance, focusing on team basis, Uncommon sense finding about teams
    c. The new organizational paradigm
6. **Management Audit** (4)
    a. Meaning and Definitions, Objectives, Scope and Importance.
    b. Advantages and Disadvantages of Management Audit.
    c. Qualification and duties of the Management Auditor.
    d. Difference between Management Audit and Statutory Audit.
    e. Drafting reports for Managerial effectiveness.
7. **Case Study** (14)
    - A real word situation facing a manager should be considered for analysis & discussion

REFERENCE BOOKS:

1. Koontz – Principles Of Management (Tata Mc Graw Hill, 1st Edition 2008)
2. Stoner , Freeman & Gilbert Jr – Management (Prentice Hall Of India ,6th Edition)
3. Robbins & Coulter – Management (Prentice Hall Of India,8th Edition)
4. Ghuman & Ashwathapa – Management - Tata Mc Graw Hill
5. Robbins S.P And Decenzo David A. – Fundamentals Of Management : Essential Concept And Applications (Pearson Education ,5th Edition)
6. L.M.Prasad – Principals Of Management (Himalaya Publications)
7. Sherlekar & Sherlekar – Modern Business & Organization (Himalaya Publications)
8. Adhikari-Global Business Management-Macmillan
9. Dr. Manmohan Prasad – Management – Concepts & Practices (Himalaya Publications)
10. Hiller Frederick S. And Hiller Mark S. – Introduction To Management Science : A Modeling and Case Studies Approach With Spreadsheets (Tata Mc Graw Hill, 2nd Edition 2008)
11. Weihrich Heinz And Koontz Harold – Management : A Global And Entrepreneurial Perspective (McGraw Hill 12th Edition 2008)
12. Thomas N. Duening , John M.Ivancevich : Management (Biztantra-Dreamtech Press, New Delhi.)
13. T Ramasamy : Principles Of Management – (Himalaya Publications)
14. R.N.Gupta :Principles Of Management , (S. Chand)
15. Griffin, Ricky W. :Management Principles & Application (Cenage Learning/Thomson Press)

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A. .

SEMESTER: I

Paper: 102: Accounting for Managers

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Introduction to Concepts & Conventions of Accounting (7)

a) Financial Accounting, Management Accounting & Cost Accounting:

b) Basic Concepts in Financial Accounting & Cost Accounting

c) Preparation of Cost sheet

d) Accounting Concepts & Conventions

e) Accounting Standards: AS-1, AS-2, AS-3,AS-5,AS-6,AS-9, AS-10, AS-20,AS-22

2) **Accounting for Planning & control**

a) **Budget & Budgetary Control** (10)

i) Concept, Objectives, & Limitations

ii) Classification of Budgets – Operating, Financial & Capital Budget

iii) Cash Budget, Flexible budget, Production Budget, Sales Budget

b) **Standard Costing** (7)

i) Concept, Essentials of an effective system of standard costing

ii) Material & labour Variances

iii) Causes & Disposition of the above variances

3) **Accounting For Managerial Decision Making**

a) **Preparation, Analysis & Interpretation of Financial Statements** (12)

i) Introduction & Limitations of Financial Statements

ii) Techniques of financial Statement Analysis**:** Comparative Financial Statements, Common Size Statement, Trend Analysis.

iii) Ratio analysis : Liquidity Ratios, Activity Ratios, Profitability Ratios, Solvency Ratios

iv) Limitations of Ratio Analysis

v) Funds flow & Cash Flow Analysis : Concept of Funds, Funds flow statement, & Cash flow statement (Refer AS-3)

b) **Marginal Costing & Break Even Analysis** (8)

i) Concept of Marginal Cost: Contribution, Variable Cost, Fixed Cost, Semi-Variable Cost, Margin of Safety, PV Ratio

ii) Assumptions of Break Even Analysis & Calculations of Break Even Point

4) **Management of Working Capital** (6)

a) Concepts: Gross and Net, Permanent & Temporary, Operating Cycle

b) Disadvantages of insufficient Working Capital

c) Financing Of Working Capital, Maximum Permissible Bank finance

d) Factors Determining Working Capital Requirement

e) Estimation of Working Capital Requirement

References:

1. Management Accounting: Khan & Jain , Tata Mc-Graw Hill
2. Management Accounting: I. M. Pandey, Vikas Publication
3. ; Accounting for Managers - Vijaykumar - Tata Mc-Graw Hill
4. Management Accounting: James Jimbalvo, Willy India
5. Management Accounting: Dr. Jawaharlal, Himalay Publications
6. Management Accounting: Dr. S.N. Maheshwari & Dr. S.K. Maheshwari, Vikas Publications
7. Principles of Management Accounting: Manmohan & S. N. Goyal
8. Accounting Standards: D. S. Rawat ,
9. Accounting for Managers: Thukaram Rao , new age
10. Management Accounting: Ravi Kishore, Taxmann Publications
11. Corporate Accounting : Ashok & Deepak Sefgal
12. Management Accounting: Prasanna Chandra, Prentice Hall
13. Cost Accounting: RSN Pillai & V. Bagavathi
14. Students guide to Cost & Management Accounting: Ravi Kishore, Taxmann Publications
15. Management Accounting-Concepts and Applications-Kothari -Macmillan
16. Management Accounting: Dr. J. Madegowada, Himalaya

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: I

Paper: 103: Managerial Economics

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50hours

1) Basic Of Managerial Economics (10)

a) Nature & Scope Of Managerial Economics
b) Managerial Decisions In Competitive Markets
c) Industry And Firms
   i) Definitional Problems
   ii) Standard Industrial Classification
   iii) Industrial Structure In India
d) Measuring & Maximizing Economic Profit
e) Maximizing The Value Of A Firm
f) Demand: Determinants, Elasticity And Forecasting Methods
g) Supply : Determinants And Its Elasticity
h) Competition And Market Power
i) Meaning ,Measurement And Determinants Of Market Power

2) Different Market Structures And Equilibrium Of Firm In Product & Input Markets (18)

a) Traditional Theory Of Firm : Profit Maximizing Theory
b) Managerial Decisions for Firms and Industry In Perfect Competition & Imperfect Competition
   i) Demand Curves, Average And Marginal Revenue Curves & Costs Curves
   ii) Profit Maximization Output & Pricing Decisions In The Short Run & In The Long Run
   iii) Profit Maximizing Input Usage
      (1) Marginal Revenue Product & Hiring Decisions
      (2) Average Revenue Product &The Shutdown Decision
c) Oligopoly Markets
   i) Strategic Decision Making In Oligopoly Markets
   ii) Importance Of Entry Barriers
d) Modern Theory Of Firm :Alternative Maximizing Theory
   i) The Separation Of Ownership From Control
   ii) Principal-Agent Theory
   iii) Sales Maximizing Theory
   iv) Importance Of Non Maximizing Theories
e) Pricing Practices
   i) Price Discrimination
   ii) Full Cost Pricing
   iii) Product Life Cycle Pricing
   iv) Transfer Pricing

3) Economics Of Regulation (10)

a) The Need For Government Intervention And Social Control Over Industries
b) The Ways & Means For Government Regulation Of Industries
   i) Property Right Regulation
   ii) Patents
   iii) Subsidy Policy

iv) Tax Policy

c) Cost Of Regulation & Government Intervention

d) Competition & The Role Of The Government

i) Government Failures

ii) Deregulation And Privatization

iii) Regulatory Reforms For Promoting Competition

4) Economics Of Corporate Growth, Merger, Diversification & Innovation (12)

a) Corporate Growth

i) The Need For Growth

ii) Growth ,Profitability & Size

b) Diversification And Collusion

i) Meaning ,Extent & Types

ii) Reasons For Diversification and Collusion

c) Merger

i) Meaning And Reasons For Merger

ii) Difference Between Merger &Takeovers

iii) The Effect Of Merger

References

1) An Introduction To Industrial Economics: P.J. Devine, N.Lee, R.M. Jones &W.J. Tyson (4th Edition) (Anmol Publication, New Delhi)
2) Managerial Economics – Gupta – Tata McGraw Hill
3) Industrial Economics: R.R.Barthwal, Wiley Eastern Ltd
4) Managerial Economics: Concept & Application: Christopher R. Thomas & S.Charles Maurice, Mc-Graw Hill, 8th Ed.
5) Managerial Economics - Samuelsion – Tata McGraw Hill
6) Managerial Economics: H.Craig Peterson,W.Cris Lewis,Prentice- Hall Of India,3rd Ed.
7) Economics:Principles &Policy: W.J.Baumal & Alan S Blinder,Harcourt Brace Jovanovich, Publishers
8) Principles Of Economics: Lipsey + Chrystal,Oxford
9) Managerial Economics: Mark Hirschey , Thomson 10ed.
10) Industrial Organization: Luis M.B.Cabral, Jaico Publishing House
11) Managerial Economics - Pal-Macmillan
12) Managerial Economics : Mankiv, Cenage Thompson Press

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A. .

SEMESTER: I

Paper: 104: Information Technology For Managers

60 + 40 Pattern: External Marks 60 +Internal Marks 40 (Test Marks 20 + Practical Marks 20) = Maximum Total Marks: 100

Required Lectures: 50hours

1) Fundamentals of Information Technology **(03)**

a) Basics Of Computer: I/P, O/P Hardware, System/Application Software

b) What Is Information Technology, Basic Concepts

c) Benefits In Information Technology

2) Introduction To Database **(06)**

a) Business Intelligence

b) Managing Data : File Environment, Data Problems And Difficulties, Solutions, Data Life Cycle, Data Sources, Data Quality

c) Database Management System

d) Logical Data Models

e) Data Warehousing

f) Data Mining – Concept And Application

g) Structured Query Language(SQL)

3) Information & Communication Technology In Organizations **(03)**

a) Impact Of Information Technology On Organizations

b) Improving Business Processes Through ICT

4) IT Oversight And Governance In Organizations **(06)**

a) The Role Of Business Processes

b) The Missing Roles Of IT Governance That Cause Business Failure

c) Modern Roles And Responsibilities Of IT & Business Units

d) IT Governance And Business Vision, Mission, And Objectives

e) Benefits Of Effective IT Governance

5) Strategic Issues Of Information Technology **(03)**

a) Strategic Advantage & Information Technology

b) Information Technology & Corporate Strategy

c) Integrating Technology With Business Environment

6) International Business & Information Technology **(03)**

a) Key Issues In International Environment

b) Managing Information Technology Internationally

c) Transnational Virtual Firms & IT

7) Role Of Government & E- Governance (03)

a) Concept of E-Governance W.R.T. Govt.

b) Need, Benefits Of E-Governance W.R.T. Govt.

c) Areas of E-Governance W.R.T. Govt.

d) E-Governance Initiatives In India

8) Web Revolutions (08)

a) Network Computing: Internet & Web, Intranet & Extranet

b) Internet Software Agents: Search Engines, Directories, Software & Intelligent Agents

c) Portals: Information & Corporate Portals

d) Communication: Web-Based Call Centers, Electronic Chat Rooms, Voice Communications, Blogging

e) Virtual Collaboration, Groupware, Electronic Meeting Systems, Electronic Teleconferencing

f) E-Learning, E-Learning Vs Distance Learning, Benefits Of E-Learning, Virtual Universities, Virtual Work & Telecommuting

9) Mobile And Wireless Technology (03)

a) Broadband (High-Speed Packet-Based Wireless)

b) Voice Over Packet Networks (Vop)

c) General Packet Radio Service (GPRS)

d) Wireless Application Protocol (WAP)

e) Messaging

10) MS Office – 2007 (12)

a) Microsoft Word 2007- Creating Word Documents, Mail Merge, Use Of Advanced Functions

b) Microsoft Access 2007 – Creation Of Database, Queries, Reports, Labels & Forms

c) Microsoft Excel 2007 – Creation And Application Of Spread Sheet, Data Analysis And Management, Use Of Formulas, Functions And Graphs & Charts

d) MS PowerPoint 2007 – Creation, Organization And Presentation

e) Use Of Outlook Express- Mailing Through Outlook And Managing Groups

List Of Practical

1. MS Word – Creation Of Document, Formatting, Editing
2. Organizing Information With Tables And Outlines
3. Mail Merge Application
4. MS-Access – Creating Database, Defining Primary Keys, Designing Query
5. MS-Access – Designing Reports, Labels And Forms
6. Creating And Editing Worksheet
7. Creating And Using Formulae And Functions
8. Sorting And Querying Data, Working With Graphs And Charts
9. MS Power Point Slides, Use Of Templates And Slide Designs

10. Developing A Professional Presentation On Business Plan
11. Internet : Web Search And Surfing For Information
12. Publishing Documents On Web
13. Creating And Managing E-Mail Account
14. Creating And Managing Blog
15. Manipulation Of Data Base Using SQL – Create, Insert, Select, Select All
16. Manipulation Of Data Base Using SQL – Select Query, Cross Tab Query, Make-Table Query, Update Query, Append Query, Delete Query
17. To Design A Query To Access Selected Fields From Table To Generate Knowledge Base

References

1. Information Technology For Management By Henry Lucas,7th Edition, Tata Mc-Graw Hill, New Delhi
2. Information Technology For Management: Transforming Organisations In The Digital Economy By Turban, Mclean, Wetherbe, 4th Edition, Willy India Edition, New-Delhi
3. Business Process Management: Integration In A Web-Enabled Environment By Margaret May, Prentice Hall Financial Times, Pearson Education, New Delhi.
4. Manage IT As A Business: How To Achieve Alignment And Add Value To The Company By Bennet P. Lientz & Lee Larssen, Elsevier Butterworth–Heinemann
5. E-Commerce E-Business By C.S. Rayudu, Himalaya Publication, New Delhi
6. Fundamentals Of Information Technology By Alexis Leon, Leon, Vikas Publications, New Delhi
7. MS-Office 2007 For Dummies By Peter Weverka Willy, New Delhi
8. MS-Office 2007 By Rutkosky, BPB Publication, New Delhi

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A. .

SEMESTER: I

Paper: 105: Introduction To Operations Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50hours

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1) The System Of Operations Management (12)

a) Production & Operations Management
   i) Meaning & Nature of Operations Management
   ii) Role of Operations Managers
   iii) Operation Management Vis-à-vis other functions in organisations
   iv) Challenges before Operations Management
   v) Product Design
   vi) Process Design
   vii) Automation

b) The Nature Of Business Policy
   i) Formation & Implementation

c) Operations Policy
   i) Competitive Advantage
   ii) Policy Implications & Implementation

d) Management & Services
   i) Characteristic , Classification & Quality Of Services
   ii) Designing Service Processes
   iii) Service Scenario Of India

e) Business Process Outsourcing & Offshoring
   i) Introduction To Outsourcing, Offshoring, Near Shoring & Form Shoring
   ii) Indian Continent: As A Outsourcing Hub

2) Capacity Management (12)

a) Need for Operations Planning & Control

b) Capacity & Capacity Planning
   i) Meaning, Need & Importance Of Capacity
   ii) Types Of Capacity
   iii) Process of Capacity Planning
   iv) Capacity Measurement

c) Capacity Management Strategies
   i) Provision For Variation Or Efficient Adjustment
   ii) Elimination Of The Need For Adjustment
   iii) Capacity expansion strategy

d) Factors Influencing The Choice Of Strategy
   i) Feasibility Factors
   ii) Desirability Factors & Factors W.R.T. Customer Order

3) Facilities Planning (12)

a) Product Selection
b) Process
c) Locational Design(Numerical On Locational Analysis
d) Layout Of Facilities
e) Need & Objectives On Layout Planning
f) Basic Types Of Layouts
g) Layout Planning Procedure
h) Material Handling
i) Factors Affecting Facility Location Planning

4) Materials & Inventory Management (14)

a) Materials Planning & Control
   i) Significance & Benefits Of Material Planning – Material Requirement Planning, Aggregate Planning
   ii) Factors Influencing Material Planning
   iii) Guidelines & Problems On Material Planning
b) Introduction To Material Budgeting,
   i) Material Control
   ii) Records Of Material Control
c) Vendor Development & Rating
   i) Need For Vendor Development
   ii) Vendor Evaluation & Selection Process
   iii) Factors On Vendor Evaluation & Rating
   iv) Vendor Motivation (Records & Punishment)
   v) Numerical On Vendor Rating
      (1) Categorical Plan
      (2) Weighted Point Plan
      (3) Cost Ratio Plan
d) Introduction To Value Analysis & Value Engineering
   i) Historical Perspective
   ii) Types Of Values & Their Function
   iii) Value Tests
   iv) Steps In Value Analysis
   v) Value Engineering & Simplification Analysis
   vi) Benefits Of Value Engineering
e) Inventory Management
   i) Functions & Classifications
   ii) Importance
   iii) Inventory Models (Simple E.O.Q. & E.O.Q. With Discounts)

References

1. Production & Operations Management – Kanishka Bedi – Oxford Press
2. Production & Operations Management – Chunawala & Patel – Himalaya Publishing House

3. Production & Operations Management - N.G. Nair – Tata McGraw Hill
4. Production & Operations Management – K.Ashwathappa & K. Shridhar Bhat - Himalaya
5. Production & Operations Management – Upendra Kachru – Excel Books
6. Operations Management – Ray Wild – Thomson Learning
7. A Modern Approach To Operations Management – Dr Ram Naresh Roy – New Age International
8. Production & Operations Management – S.N. Chary – Tata McGraw Hill
9. Materials Management – K. Shridhat Bhat - Himalaya Publishing House
10. Industrial Engineering & Production Management – M. Mahajan- Dhanpat Rai & Sons
11. Industrial Engineering & Management – O.P Khanna - Dhanpat Rai & Sons
12. Stores Management (2/e) - Menon - Macmillan
13. Operations Management – Evans & Collier – Cenage Publishing
14. Operations Management – Russel & Taylor – Willey India.

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: I

Paper: 106: Organizational Behavior

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50hours

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1) Introduction **(6)**

a) Definition of O.B,
b) Key elements of O.B.
c) Nature & Scope of O.B.
d) O.B. Process
e) Disciplines contributing to O.B.
f) Organization Culture & Diversity
g) Emerging challenges and opportunities for O.B.
h) International O.B

2) Individual Perspective **(7)**

a) Personality. Concept. Determinants and Types, How Personality influences O.B
b) Attitudes. Types, Components & Functions. Attitudes& O.B.
c) Concept of Job Satisfaction.
d) Perception. Definition, Basic Elements, Factors Influencing Perception, Attribution.
e) Impression Management.
f) Learning. Meaning. Determinants, Principles, Learning & Behavior

3) Interpersonal Relationship **(7)**

a) Developing interpersonal relations
b) Conflict. Meaning, Sources, Types.
c) Intrapersonal Conflict - Role Identity, Role Perception, Role Expectation, Role Conflict.
d) Interpersonal Conflict (Transactional Analysis and Johari Window)
e) Aspects of Conflict (Functional and Dysfunctional)
f) Conflict Management

4) Group Dynamics **(6)**

a) Groups in Organization, Nature, Membership, Process of Group Development, Types of Groups, Group structure
b) Group Norms, Group Conformity, Group Cohesion, Group Size, Group Think, Group Shift.
c) Group dynamics & Inter-group dynamics

5) Motivation **(6)**

a) Meaning
b) Types of Motives
c) Theories of Motivation
   i) Hierarchy of needs Theory
   ii) Theory X and Theory Y
   iii) Motivation-Hygiene Two Factor theory
   iv) ERG theory
   v) Vroom's Expectancy theory
   vi) Mc Cellands Learned Needs Theory
   vii) Goal Setting Theory
   viii) Reinforcement Theory

d) Motivation applied - Financial and non-Financial motivators

6) Leadership (6)

a) Meaning , Functions, Styles, Traits of Leadership
b) Theories of Leadership
c) Likert's System of 4
d) Fielders Leadership Contingency theory
e) Hersey-Blanchards Situational Leadership Theory
f) Path Goal Theory
g) Charismatic Leadership Theory
h) Transformation Leadership Theory
i) Ohio State Leadership Quadrants and Management Grids

7) Change Management and Development (6)

a) Why Organization changes?, Planned Change, Resistance to change, Managing resistance to change
b) Meaning of organization development, Characteristics, Objectives.
c) Work stress : Meaning of Stress, Nature and sources of stress, Consequences of Stress, Stress & Task Performance, Coping Strategies for the Stress

- **Case study:** A real word situation facing a manager should be considered for analysis & discussion **(12)**

References

1. Organization Behavior – Margie- Paraikh- Tata McGraw Hill
2. Organization Behavior – Suja R. Nair, Himalaya Publications
3. Organization Behavior –Stephen P . Robbins, Pearson
4. Organization Behavior –S.S. Khanka – S Chand
5. Organization Behavior – K. Ashwathappa - Himalaya
6. Organization Behavior – Arun Kumar & N. Meenakshi, Vikas Publishers
7. Human Relations and Organisational Behaviour (5/e) - Dwivedi - Macmillan
8. Organization Behavior – Schernerhorn, Hunt, Osborn, Willy India
9. Foundation of OB – Slocum & Hellriegel, Cenage Learning
10. Organization Behavior – Nelson & Quick, Cenage Learning
11. Organization Behavior – Dr. Nirajkumar, Himalaya Publications
12. Management & OB – Jayantee Mukherjee-Saha, Excel Books
13. Organization Behavior –Fred Luthans - TMH
14. Human Behavior at Work –Keith Devis-TMH
15. Organization Behavior – P G Aquinas, Excel books, New Delhi
16. Organization Behavior – M.N. Mishra, Vikas Publications

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: I

Paper: 107: Corporate Social Responsibility

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50hours

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1) Understanding Social Issues **(10)**

a) Social Issues : Concept, Characteristic and Causes of Social Problems

b) Social Issues *vis-a-vis* corporate environment: Castism, Regionalism, Agitation in Youth, Urbanization, Terrorism, Black money, Corruption, Sexual Harassment at Workplace & their impact on Society

c) Values, norms & beliefs

d) Culture, Cultural différences & Discrimination – Equal opportunities.

e) Business & Society

f) Impact of Technology on the society - Social Cost of Development

2) Business Ethics **(15)**

a) Basic Framework

i) Meaning & Importance & Factors affecting Business Ethics

ii) Morality, Applied Ethics, Moral Standards, Code of Ethics

b) Ethical Mind

i) Basics of Mind Management

ii) Objective & Subjective Mind

iii) Training the Mind

iv) Self Development

v) Stages of Self Development

vi) Effects of Past Tendencies

c) Ethical Decision Making

i) Ethical D/M Process

ii) Transparency as a factor in decision making

iii) Ethical consistency, Ethical enquiry and reasoning

iv) Ethical Dilemma

v) Role & Qualities Of CEO

vi) Business ethics & CEO

3) Corporate Social Responsibility – I **(10)**

a) Understanding CSR

i) Concept & Definition of Corporate Social Responsibility

ii) Scope of Corporate Social Responsibility

iii) Corporate Social Responsibility and the Law

iv) Corporate Social Responsiveness

v) Corporate Social Performance

vi) Corporate Citizenship

vii) Corporations as Stakeholders

viii) Diverging Views on Social Responsibility(Arguments for & against)

ix) Social Responsibility & Indian Corporations

b) A Stakeholder Approach to Socially Responsible and Ethical Behavior

i) Criterion for Determining The Social Responsibility of Business
ii) Areas of Social Responsibility of Business
iii) Social Accounting & Social Audit

4) Corporate Social Responsibility – II **(07)**

a) Ethical issues in Functional Areas
i) Marketing, HRM, Finance
ii) Information Technology
iii) Intellectual Property Rights

b) Unethical Behavior in Organizations
i) Understanding Unethical Behavior
ii) Individual Factors Contributing to Unethical Behavior
iii) Organizational Factors Contributing to Unethical Behavior

5) Corporate Governance **(08)**

Understanding Corporate Governance
i) Concept, Meaning, Principles of Corporate Governance
ii) Issues in Corporate Governance
iii) Parties to Corporate Governance
iv) Professionalization of Corporate Governance
v) 'Good' Corporate Governance
vi) Corporate Governance Practices in India
vii) Corporate Governance Rating

References

1. Ethics and Corporate Social Responsibility: Why Giants Fall by Ronald R. Sims, Greenwood Press, 2003.
2. Corporate Governance: Principal Policies & Practices by Fernando, Pearson Education
3. Corporate Ethics: The Business Code of Conduct for Ethical Employees by Steven R. Barth, Aspatore Books, 2003
4. Business ethics & corporate governance: Mandal – Tata McGraw Hill
5. Business ethics - by Fernando, Pearson Education
6. Business Ethics by Agalgatti, Nirali Publication
7. Ethics in Management & Indian Ethos by Biswanath Ghosh, Vikas Publications
8. Ethical Management: Text cases in BE & CG by Satish Modi, Macmillan
9. Business Ethics Manisha Paliwal, New age International
10. Business Ethics & Values by Senthil Kumar, Himalaya Publications
11. Business Ethics: Concept & Cases by Manuel Velasquez
12. Business Ethics: Text & Cases, by C.S.V. Murthy, Himalaya Publication
13. Social Problems in India by Ram Ahuja, Rawat Publications.
14. Corporate Governance and Business Ethics – Mathur - Macmillan
15. Corporate Social Responsibility by Baxi & Prasad, Excel Books
16. Corporate Governance - Economic Reforms & Development by Reed Darryl & Sanjay Mukherjee, Oxford

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: I

Paper: 108: Corporate Communication Skills

60 + 40 Pattern: External Marks 60 +Internal Marks 40 (Test Marks 20 + Practical Marks 20) = Maximum Total Marks: 100

Required Lectures: 50hours

1) Communication **(6)**

- **a)** Meaning, Objectives, Process & Importance of communication
- **b)** Types of Communication
  - i) Verbal-Non verbal : Kinesics & Proxemics
  - ii) Written-Oral
  - iii) Formal-Informal & Internal-External
- **c)** Means of Communication
- **d)** Barriers & Measures to overcome the barriers to Communication
- **e)** Principles of effective communication

2) Communication Skills **(14)**

- **a)** Reading Skills: Rapid Reading, Comprehension.
- **b)** Speaking Skill: Speech-preparation, Guidelines for Effective speech, Negotiation, Discussion
- **c)** Listening Skill: Importance, Process, and Barriers & Guidelines for Effective Listening.
- **d)** Presentation Skill: Types of Presentations, Propositions about presentations, Types of delivery, Process of Preparing & Delivering.
- **e)** Computer based Power Point presentation
- **f)** Interview : Types, Preparation, Conducting and Appearing for interview
- **g)** Meeting – Planning, Agenda, Layout, Leading the meeting, Drafting Minutes of Meeting & Steps for effective meeting outcomes.

3) Written Communication **(12)**

- **a)** Meaning, Distinction with Oral Communication, Merits & Limitations of Written communication.
- **b)** Letter writing: Layout of Business letter, types of layouts, Essentials of Good Business letters, Attitude in Business writing
- **c)** Purpose of letters: Resume, Application. Writing Direct Messages by Manager – Delivering: Positive, Neutral & Negative Information.
- **d)** Holding Press Conferences & Preparing Press Releases, Media Interviews
- **e)** Report Writing: Meaning & Nature of Report, Formats of Reports – Formal, Informal reports, Writing Reports - Data collection, organizing, presentation of the Report.
- **f)** Drafting Skills: Documents, Policies, Procedures, Rules, Note taking etc.

4) Organizational Communication (8)

a) Meaning & Importance of Organizational Communication

b) Internal communication: Notice, Circular, Memo.

c) External Communication – Enquiries, Quotations, Bank & Financial Institutions

5) Case Study Methods (10)

a) Meaning of the Case study method

b) Types of Cases

c) Analyzing the Case – Case Analysis Approaches

d) Case Analysis Process

e) Discussing & Presenting a Case

f) Writing the Case Report

- **Note for Practical:** Practice sessions for development of skills should be regularly conducted. Continuous assessment based on participation and performance should be evaluated for 20 marks in internal assessment.

References

1. Business Communication for Managers By Penrose / Rasberry / Myers, Cenage Learning.
2. Business Communication by Raman & Singh, Oxford Publication.
3. Basics of Business Communication – Lesikar & Flatley – Tata McGraw Hills
4. Communication Today By Ruben Roy, Himalaya Publication.
5. Business Communication By Sehgal & Khetarpal, Excel Books
6. Business Communication – C.S. Raydu – Himalaya Publishing House
7. Communication For Business – Taylor - Pearson Education
8. Communication Skills – Dr Rao & Dr. Das – Himalaya Publication
9. Contemporary Business Communication – Scot Ober – Biztantra :Dreamtech
10. Business Communication Today – Bovee, Thill, Schatzman – Pearson
11. Business Communication – R.K. Madhukar – Vikas Publication
12. Developing Communication Skills (2/e) Mohan & Banerjee Macmillan
13. eWriting: 21st Century Tools for Effective Communication-Booher Macmillan

2011

NorthMaharashtraUniversity, Jalgaon

FACULTY OF COMMERCE & MANAGEMENT

Syllabus of Master in Business Administration (MBA)

SEMESTER: II

W.E.From 2011

North Maharashtra University, Jalgaon

(NACC Accredited 'B' Grade University)

FACULTY OF COMMERCE & MANAGEMENT

STRUCTUREOFMASTER IN BUSINESS ADMINISTRATION (M.B.A.)

Semester-I and II			
Paper	**Semester-I** **A : Credit Courses**	**Paper**	**Semester-II** **A : Credit Courses**
101	Management Science	201	Management Practices
102	Accountancy For Managers	202	Business Research Methods
103	Managerial Economics	203	Global Economic Scenario
104	Information Technology For Managers	204	Management Information System and ERP
105	Introduction To Operations Management	205	Financial Management
106	Organizational Behavior	206	Human Resource Management
107	Corporate Social Responsibility	207	Marketing Management
108	Corporate Communication Skills	208	Quantitative Techniques

Semester-III and IV			
Paper	**Semester-III** **Credit Courses**	**Paper**	**Semester-IV** **Credit Courses**
301	Strategic Management	401	e-Commerce & Excellence Management
302	Entrepreneurship & Project Management	402	Family Business Management
303	Legal Aspects Of Business	403	Indian Commercial Laws
304	Specialization-I (Major)*	404	Specialization-V (Major)*
305	Specialization-II (Major)*	405	Specialization-VI (Major)*
306	Specialization-III (Major)*	406	Specialization-VII (Major)*
307	Specialization-IV (Major)*	407	Project Report & Viva-Voce*
308	Specialization (Minor-I)**	408	Specialization (Minor-II)**

*Specialization In Major Subjects (Any One)		**Specialization In Minor Subjects (Any One)	
A	Financial Management	A	Financial Management
B	Marketing Management	B	Marketing Management
C	Human Resource Management	C	Human Resource Management
D	Operations Management	D	Operations Management
E	International Business Management	E	International Business Management
F	Agro Business Management	F	Agro Business Management
G	Systems	G	Systems

North Maharashtra University, Jalgaon

(NACC Accredited 'B' Grade University)

FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: II

Paper: 201: Management Practices

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. Management of Business Practices (21)

1.1. Indian Management Practices (03)

1.1.1.Indian Ethos:Essential Features & insights

1.1.2.Features of Traditional business & Modern business

1.1.3.Indian Transnational Corporations: Features of Indian TNC's

1.1.4.Indian Management Practices

1.2. Japanese ManagementPractices(10)

1.2.1.5-S system: Meaning, Philosophy, Micro level techniques, Advantages, Limitations and Pre-requisites

1.2.2.Kai-Zen : Meaning, Philosophy, Micro level techniques, Advantages, Limitations and Pre-requisites

1.2.3.Poke-Yoke: Meaning, Philosophy, Micro level techniques, Advantages, Limitations and Pre-requisites

1.2.4.Zero Defect Program (ZDP) : Meaning, Philosophy, Micro level techniques, Advantages, Limitations and Pre-requisites

1.2.5.Waste Reduction : Meaning, Philosophy, Micro level techniques, Advantages, Limitations and Pre-requisites

1.3. Global Management Practices (08)

1.3.1.Patterns of Management analysis

1.3.2.TOWS matrix : A modern tool for analysis

1.3.3.Diversity Management

1.3.3.1. Diversity and Multiculturalism : Nature, Dimensions and its Effects

1.3.3.2. How to manage Diversity and Multiculturalism in the Organisation

1.3.4.Managing Growth : Necessity, Need & Objective of Growth

1.3.5.Bench Marking :

1.3.5.1. Definition, Need, Levels & prerequisites,

1.3.5.2. Process : Planning, Analysis, Integration, Action Phase

1.3.5.3. Advantages& limitations of Benchmarking.

2. Services Management (14)

2.1. The pace of growth of Service sector in the GDP of an Economy.

2.2. Service& its business application

2.2.1.Definition

2.2.2.Difference between Goods & Services

2.2.3.Quality dimension: Features, Performance, Reliability-Credibility, Conformance, Durability, Serviceability, Aesthetics, Perceived quality, Courtesy, Consistency, Accuracy, Completeness, Timeliness, Responsiveness & Tangibility of service.

2.3. Return on service quality: Cost of quality and Profit linkage

2.4. Other functional areas of Service management practices

2.4.1.Disaster Management : Introduction, Features & Outcome of Disaster management

2.4.2.Event Management : Features, Problems& Process of Event management

2.4.3.Hospitality Management:

2.4.3.1. Functional Areas of Hospitality

2.4.3.2. Hospitality as a service Industry

2.4.3.3. Housekeeping operations, Waste reduction
2.4.3.4. Hospitality technologyand Risk management in hospitality.
2.4.3.5. Hotel Finance
2.4.4.Business Process Outsourcing:
2.4.4.1. Meaning, Benefits& Growth Drivers
2.4.4.2. Types Of Outsourcing
2.4.4.2.1. Customer Service Outsourcing
2.4.4.2.2. Accountancy Outsourcing
2.4.4.2.3. Internal Audit Of Transactions Outsourcing
2.4.4.2.4. Legal Outsourcing
2.4.4.2.5. Insurance And Banking Outsourcing
2.4.4.3. Business Process Improvement
2.4.4.4. Business Process Management Versus Functional Management
2.4.4.5. Back Office Outsourcing
2.4.4.6. Differences Between Business Process Outsourcing & Outsourcing

3. Knowledge Management (05)

3.1. Knowledge Management
3.1.1.Introduction and Definition
3.1.2.Market value proposition and Prosperity of Knowledge management
3.1.3.Threephases of Life cycle- Acquisition, Enhancement & Retention
3.2. Understanding Customer Value Knowledge Chain
3.3. Phases of Customer Knowledge Cycle

4. Case study (10)

4.1. A real world situation faced by a manager should be considered for analysis and discussion of the cases based on the above topics.

REFERENCE BOOKS:

1. Global Management Solutions: Demystified by Seth- Thompson Learning
2. Management: Task, Responsibilities, Practices by Peter F. Druker – Allied Publishers Pvt. Ltd
3. Indian Ethos - Nandagopal Tata McGraw Hill
4. Knowledge Management – Jawadekar- Tata McGraw Hill
5. Management: Value-Oriented Holistic Approach by S.A. Sherlekar – Himalaya Publishing House
6. Business Organizations&Management by Vasishth, Rajput – KitabMahal
7. Essentials of Business Environment by K. Ashwathappa – Himalaya Publishing House
8. Total Quality Management by K. ShridharBhat – Himalaya Publishing House
9. The Essential Guide to Knowledge Management by AmritTiwana – Pearson Education Asia
10. Business Process Outsourcing – SarikaKulkarni – Jaico Publishing House
11. Management: Principles & Applications by Ricky Griffin – Cengage Learning
12. Management (2008 Edition)– Kreitner, Mohapatra- Biztantra (Willy India Pvt. Ltd.)
13. Management by Stoner, Freeman, Gilbert – Pearson/ Prentice Hall
14. Management – Text & Cases by V.S.P.Rao& V Hari Krishna– Excel Books
15. Total Quality Management – by B. SenthilArasu& J. Pravin Paul – Scitech Publications Pvt. Ltd.
16. Information and Knowledge Management –Kamalavijayan-Macmillan
17. Global Business Management Adhikari Macmillan
18. Introduction to Disaster Management Modh Macmillan

North Maharashtra University, Jalgaon

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: II

Paper: 202: Business Research Methods

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

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1. Research Methodology **(06)**

1.1. Meaning, Objective, Importance & Types of Research

1.2. Research Process

1.3. Features &Criteria of Good Research.

1.4. Research In Functional Area of Management

1.5. Problems encountered by Researchers in India

2. Research Problem **(04)**

2.1. Formulation of Research problem

2.2. Selecting the Problem, necessity of Defining the Problem

2.3. Techniques involve in Defining a problem

2.4. Literature Survey

3. Research Design **(06)**

3.1. Meaning & Need for Research Design

3.2. Feature of Good Research Design

3.3. Important Concept Relating to Research Design

3.4. Types of Research Design : Exploratory/ Formulative, Descriptive/ Diagnostic & Hypothesis Testing/Experimental Research design

3.5. Validity & Reliability In Research

4. Sampling Design **(05)**

4.1. Sampling Terminology, Steps in Sampling Design, Criterion of selecting sampling procedure

4.2. Sampling Methods

4.2.1.Probability Sampling: Simple random, Systematic, Stratified, Cluster, Area, Multi-stage, Proportional, Sequential sampling.

4.2.2.Non-probability Sampling: Convenience, Quota, Snowball, Judgment

5. Data Management **(09)**

5.1. Data Collection

5.1.1.Types & Sources of Data: Primary & Secondary

5.1.2.Methods of Data Collection: Observation, Interview, Questionnaire, Schedule & Survey Method

5.1.3.Guidelines for Constructing Questionnaire/ Schedule, Choice of Questions

5.1.4.Measurement Scales: Nominal, Ordinal, Interval, Ratio

5.1.5.Sources of Error

5.2. Measurement & Scaling Technique

5.2.1.Tests of Sound Measurement: Validity, Reliability, Practicality

5.2.2.Scaling: Meaning, Classification bases.

5.2.3.Scaling Techniques: Rating Scales, Ranking Scales.

6. Testing of Hypotheses (07)

6.1. Hypothesis: Meaning, Sources, Importance & Types of Hypothesis
6.2. Criterion of Good Hypothesis
6.3. Basic Concept Concerning Testing of Hypotheses
6.4. Procedure for Hypotheses Testing
6.5. Flow Diagram for Hypotheses Testing
6.6. Level of Significance

7. Advanced Tools For Hypothesis Testing Using SPSS (08)

7.1. Parametric & Non parametric Tests
7.2. Analysis of Variance (ANOVA) : One way & Two Way
7.3. Multivariate Data Analysis: Factor Analysis, Cluster analysis, Discriminate Analysis, Multidimensional Scaling
7.4. Linear Correlation &Regression

8. Interpretation & Report Writing (05)

8.1. Interpretation: Meaning, Techniques, Precautions
8.2. Organization Report Writing
8.2.1.Writing a good report, Critical element s of a report,
8.2.2.Steps, Layout of the Research Report
8.2.3.Types of Research Reports
8.3. Summer Project Reports
8.3.1.Parameters: Declaration, Certificate, Acknowledgement, Executive Summary, Introduction of the project, Company Profile, Methodology, Collection-Interpretation & Analysis of Data, Findings-Suggestions & Conclusions, Bibliography, Annexure.

REFERENCE BOOKS:

1. Research Methodology (Methods & Techniques) – C.R.Kothari - Wiley Eastern Ltd
2. Business Research Methodology – Shrivastav- Tata McGraw Hill
3. Business Research Methodology – J.K. Sachdeva- Himalaya Publishing House
4. Business Research Methods- 7 ed. – William G. Zikmund – Cengage Learning
5. Research Methodology – A.B. Rao- Excel Books
6. Management Research Methodology – Krishnaswamy, Sivakumar, Mathirajan– PearsonEducation
7. Methodology And Techniques Of Social Research- Wilkinson &Bhandarkar- Himalaya Publishing House
8. Business Research Methods- Murthy, Bhojanna- Excel Books
9. Doing Data Analysis with SPSS by Carver, Nash – BROOKS/COLE Cengage Learning
10. Business Research Methods- Donald R. Cooper, Pamela S. Schindler- 8/e - Tata McGraw-Hill Co. Ltd.
11. A Research Methodology – Smarth&Siriya – S. Chand & Company Ltd.
12. A Handbook of Research Process Ananthanarayanan Macmillan

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: II

Paper:203: Global Economic Scenario

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50hours

1) Basics Of International Trade **(08)**

a) International Trade
b) Importance Of International Trade
c) Distinguish Features Of International Trade
d) Terms Of Trade & Factor Influencing Terms Of Trade
e) Concepts Of Tariffs & Quotas &Its Effects
f) Concept Of Balance Of Trade & Balance Of Payments: Favourable, Unfavourable
g) Free Trade Case For & Against
h) Gains From Trade To Importing ,Exporting Countries & Overall World
i) Factors Influencing Gains & Measurement Of Gains
j) Exchange Rates :Meaning & Types

2) Globalisation Forces **(08)**

a) Meaning Of Globalisation
b) Factor Facilitating Globalisation
c) Steps Towards Globalisation
d) Management Of Change To Globalisation
e) Key Global Issues for Business
f) Requisite For Globalisation
g) Globalisation Model
h) Environmental Adaptation For Globalisation

3) The Changing World **(08)**

a) International Financial Flows
b) International Migration
c) Global Environmental Challenges
d) New Political Tendencies In Developing Countries
e) Emerging Sub National Dynamics
f) Urban Imperatives
g) Implication For Development Policy

4) The World Trading System **(08)**

a) Developing Countries & Global Trading System
b) Role &Functioning Of I.M.F. & W.B., in World Economic & Trade Development
c) Role and functioning of Asian Development Banks
d) W.T.O. Mechanisms for Promoting & Maintaining Liberal Trade Regimes
e) Sustaining the Momentum For Trade Reform
f) International Trade &Development Policy

5) Developing Countries & Global Financial System **(08)**

a) The Gathering Pace Of International Integration
b) Toward A More Robust & Diversified Banking System
c) The Orderly Sequencing Of Capital Account Liberalisation
d) Attracting Foreign Investment
e) Revitalising International Macroeconomic Cooperation

6) Indian Economy In The Global Scenario **(10)**

a) India & The Global Economy
b) Changing Face Of International Trade Of India
c) Banking Sector & Financial Sector Reforms
d) Effects of Globalisation on Indian Economy
e) Global Financial Imbalances & Crises
f) The Global Financial Crisis & Indian Economy

REFERENCE BOOKS:

1. World Development Report:1999-2000 - Oxford University Press,2000
2. India &The Global Financial Crisis : Y.V.Reddy - Orient Blackswan Private Limited,2009
3. International Economics: DrS.S.M.Desai&Dr.MirmalaBhlerao - Himalaya Publishing House:2008
4. International Finance: V.A. Vadhani - Himalaya Publishing House:14th Edition:2000
5. Indain Economy : Datt&K.P.M.Sudharam - S. Chand Pvt. Ltd.
6. Indain Economy : Mishra &Puri – Himalaya Publishing House
7. Corporate Governance: Principles, Policies & Practices: A.C. Fernando - Pearson Education 2006
8. Global Business Management - Adhikari - Macmillan

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: II

Paper: 204: Management Information System and ERP

60 + 40 Pattern: External Marks 60 +Internal Marks 40= Maximum Total Marks: 100

Required Lectures: 50hours

1. Fundamentals of Management Information Systems (08)

1.1. Concepts, Classification & Value of Information

1.2. Information System : Open & Closed

1.3. Management Information System

1.3.1.Definition, Concepts & Meaning

1.3.2.Components & Activities

1.3.3.Types – Operation support system & Management support systems

1.3.4.Control systems – Feedback & Feed forward systems

1.3.5.MIS planning process – Steps in planning

1.3.6.MIS design & Development Process – Phases

1.3.7.Components of MIS

1.4. MIS vis-à-vis Computer, Academics& Users

1.5. MIS vis-à-vis Information Concepts , System Concepts

2. Process of Management Information System (08)

2.1. System Analysis & Design

2.1.1.Introduction & Need for System analysis

2.1.2.System analysis of a new requirement

2.1.3.Structured systems analysis & Design (SSAD)

2.2. Development of MIS

2.2.1.Introduction & Contents of MIS Long range plans

2.2.2.Determining the information Requirement

2.2.3.Management of Quality in the MIS

2.2.4.Factors contributing in the Success & Failure of MIS

3. Application of Management Information System (12)

3.1. Business Processes : Primary, Supportive & Administrative

3.2. MIS in functional area

3.2.1.MIS & Manufacturing sector

3.2.1.1. Operational control & Research Systems

3.2.1.2. Inventory Control System

3.2.1.3. Manufacturing system: CIM, Process control & Machine control

3.2.2.Marketing Information System: Marketing Research, Marketing planning, Sales analysis & Marketing control.

3.2.3.Accounting Information system: Financial, Management & Cost accounting system

3.2.4.Human Resource Development System: HRP system, Human Resource Information System

3.3. Service as a distinctive product

3.4. Transaction Processing System

3.5. Concept of Knowledge Based Expert System

3.6. Concept of Artificial Intelligence

3.7. Managerial Challenges of Information Technology : Success or Failure, Developmental & Ethical

4. Support System (06)

4.1. Decision Support System (DSS): Concept, Philosophy, Characteristic, Classes, Users of DSS

4.2. Executive Support System (ESS) : Introduction, Components & Architecture

4.2.1.Office Information System: Document management & Communication system

5. Enterprise Resource Planning (08)

5.1. Concept/System

5.2. Drivers for implementing ERP

5.3. ERP architecture

5.4. ERP Solution Structure: Business operations, Technology & Implementation

5.5. Benefits of ERP

5.6. ERP Selection: Vendor evaluation, Technology evaluation & Solution evaluation

5.7. ERP Implementation: Customization & Precautions

5.8. Problems encountered with ERP

5.9. Service process optimization: Service processes & its benefits

5.10. ERP in the twenty-first century

6. ERP – Technologies & Application (08)

6.1. Business Process Re-engineering

6.1.1. Meaning, Necessity& Principles

6.1.2. Application of re-engineering

6.1.3. Three R's – Rethink, Redesign & Retool

6.1.4. Reengineering in service industry

6.1.5. Quality & re-engineering

6.1.6. Benefits & Limitations of re-engineering

6.2. Material Requirement Planning (MRP-I)

6.3. Manufacturing Resource Planning (MRP-II)

REFERENCE BOOKS:

1. Management Information System by Jawadekar – Tata McGraw Hill
2. Management Information System by Arora – Excel Books
3. Management Information System by Davis & Gordon - Tata McGraw Hill
4. Management Information System by James O'Brian- Tata McGraw Hill
5. Business Process Reengineering by K Sridhar Bhat – Himalaya Publishing House
6. Management Information System by C S V Murthy – Himalaya Publishing House
7. Management Information Systems (3/e) – Goyal - Macmillan
8. Enterprise Resource Planning by Alex Leon - Tata McGraw Hill
9. Enterprise Resource Planning by Ray - Tata McGraw Hill
10. Enterprise Resource Planning (Concept & Practices) by Garg, Venkitrkrishnan– PHI
11. Enterprise Resource Planning by JyotindraZaveri - Himalaya Publishing House
12. Textbook of Enterprise Resource Planning Jaiswal Macmillan

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A. .

SEMESTER: II

Paper: 205: Financial Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50hours

1. Introduction to Financial Management **(07)**

1.1. Finance Function
- 1.1.1.Finance Concepts
- 1.1.2.Financial Information
- 1.1.3.Finance & other Functions In the Business
- 1.1.4.Factors affecting financial organizations
- 1.1.5.Finance Functions

1.2. Financial Management
- 1.2.1.Nature, Scope, Objectives & Functions
- 1.2.2.Functional Areas of Financial Management
- 1.2.3.Financial Planning
- 1.2.4.Financial Analysis: Value analysis

2. Capital Structure & Leverages **(08)**

2.1. Capital Structure
- 2.1.1.Meaning & Features & Determinants
- 2.1.2.Computation of Capital Structure
- 2.1.3.Patterns & Approaches to Capital Structure
- 2.1.4.Indifference Point
- 2.1.5.Under & Over Capitalisation

2.2. Leverages
- 2.2.1.Meaning & Types
- 2.2.2.Computation of Leverages

3. Raising Finance **(14)**

3.1. Short term Financing
- 3.1.1.Introduction & Characteristics
- 3.1.2.Sources of Short term Finance

3.2. Long Term Financing
- 3.2.1.Need for long term financing
- 3.2.2.Sources of Long Term Finance
- 3.2.3.Risk analysis in Capital Budgeting & Sensitivity analysis

3.3. Primary & Secondary Markets
- 3.3.1.Meaning, Importance & Role
- 3.3.2.Market intermediaries: brokers, dealers, investment bankers
- 3.3.3.Bid, Ask or Offer, bid-ask spread, Bull and bear, blue chips, day trading, stop loss,
- 3.3.4.BSE/ NSE Indices

4. Investment Decisions **(16)**

4.1. Short term Invest Decision

4.2. Long term Investment Decisions
- 4.2.1.Time value of Money
  - 4.2.1.1. An overview & Study of Time lines
  - 4.2.1.2. Theory of interest or computation of Interest
  - 4.2.1.3. Amortization of a loan

4.2.2.Capital Expenditure Planning & control
4.2.2.1. Definition, Importance
4.2.2.2. Computation of Cost of Capital

4.3. Capital Budgeting Techniques:
4.3.1.Payback period Method
4.3.2.Rate of returnMethod
4.3.3.Net Present ValueMethod
4.3.4.Internal rate of Return Method
4.3.5.Profitability Index
4.3.6.Replacement Decision
4.3.7.Capital Rationing

4.4. Venture Capital Finance
4.4.1.Introduction, Meaning Features & Types
4.4.2.Stages of Venture Capital Investment

4.5. Lease & Hire Purchase Finance
4.5.1.Lease
4.5.1.1. Meaning & essential elements of leasing
4.5.1.2. Types of lease & their evaluation
4.5.2.Hire Purchase
4.5.2.1. Evolution & Meaning of Hire Purchase
4.5.2.2. Characteristic , Determinants of Hire Purchase

4.6. Mutual Funds: Concept & Types

4.7. Decision making techniques
4.7.1.Lease or Buy
4.7.2.Make or Buy
4.7.3.Manufacture or Vendor Development
4.7.4.Do or Outsource
4.7.5.Owners Self Outlet or Franchisee appointment

5. Emerging trends Finance (06)

Concepts of

5.1. Corporate Combinations
5.2. Corporate Financial Distress
5.3. Derivatives & Options
5.4. Hybrid Financing: preferred stock, leasing, warrants & convertibles
5.5. Reverse Mortgage
5.6. Credit rating
5.7. Portfolio Management
5.8. International Financial Management

REFERENCE BOOKS:

1. Financial Management by Ravi M. Kishore – Taxman Publication
2. Financial Management by Khan & Jain - Tata McGraw Hill
3. Financial Management tools & Techniques by DrPradip Kumar Sinha – Excel books
4. Financial Management: Principles & Practice by G Sudarsana Reddy- Himalaya Publishing
5. Fundamentals of Financial Management by VyuptakeshSharan – Pearson Education 2nd Edition
6. Financial Management by I M Pandey – Vikas Publishing House
7. Financial Management – P.V. Kulkarni, Satyaprasad - Himalaya Publishing House
8. Financial Management – Principles & Practice by SudhindraBhat– Excel Books
9. Financial Management: Management & Policy By R.M. Srivastava - Himalaya Publishing House
10. Fundamentals of Financial Management by Brigham &Houton - Cengage Learning
11. Financial Management -Mathur - Macmillan

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: II

Paper: 206: Human Resource Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. Introduction to Human Resource Management (08)

1.1. Concept, Characteristic &Significance of Human Resource

1.2. Definitions, Nature, Scope &Objectives of HRM

1.3. Functions of HRM.

1.4. HRM Vs. Personnel Management

1.5. HRM Vs. HRD

1.6. Challenges before HRM

1.7. Employer-Employee Relationship: concepts, Objectives, Parties, Measures for Improvement

2. Human Resource Management Process (18)

2.1. Human Resource Planning (06)

2.1.1.Concept & Need of HRP

2.1.2.Process of Human Resource Planning

2.1.3.Methods of Demand Forecasting

2.1.4.Prerequisites of HRP

2.2. Process of Procurement (12)

2.2.1.Recruitment

2.2.1.1. Concept, Purpose &Factors Affecting Recruitment

2.2.1.2. Sources of Recruitment

2.2.1.3. Process of Recruitment

2.2.2.Selection

2.2.2.1. Concept Selection process

2.2.2.2. barriers of selection

2.2.3.Placement : Concept & Problems

2.2.4.Induction,

2.2.4.1. Concept, Objective &Steps in Induction

2.2.4.2. Topics of Induction Programme

2.2.4.3. Problems in Induction

3. Human Resource Development (16)

3.1. Performance appraisal (07)

3.1.1.Definitions, Objective & Process of Performance Appraisal

3.1.2.Methods of Performance Appraisal

3.1.2.1. Traditional Methods: Ranking, Paired Comparison, Grading, Critical Incident, Force Choice, Checklist, Graphic Rating, Essay Evaluation, Confidential Reports

3.1.2.2. Modern Methods: MBO, BARS, Assessment Centres, 360 Degree Appraisal System

3.1.3.Problems with Performance Appraisal

3.2. Employee Training (06)

3.2.1.Meaning, Need and Objective of Training

3.2.1.1. Methods of Training : On the Job&Off the Job

3.2.2.Sensitivity Training

3.2.3.Evaluation of Training

3.3. Executive Development (03)

3.3.1.Meaning &Methods of Executive Development

4. Recent Trends in HRM: (08)

Concepts of -

4.1. Human Resource Audit
4.2. Human Resource Information System
4.3. Human Resource Accounting
4.4. Employer branding
4.5. Moonlighting by employees
4.6. Dual career group
4.7. Competency Mapping
4.8. Downsizing & Rightsizing
4.9. HR Matrix
4.10. HR score card
4.11. Talent Management
4.12. Flexi-time & Flexi-work
4.13. e-HRM : e-recruitment, e-training & e-learning.

REFERENCE BOOKS:

1. Human Resource Management, Text & Cases By Dr. V.S.P Rao - Excel Books
2. Human Resource Management By Dr K. Ashwathappa – Tata McGraw Hill
3. Essentials of Human Resource Management By P. SubbaRao – Himalaya Publishing House
4. Human Resource Management By S.S.Khanka – S Chand & Sons
5. Human Resource Management –Sanghi -Macmillan
6. Comprehensive Human Resource Management By P.L.Rao - Excel Books
7. Human Resource Management By Snell, Bohalender Cengage Learning
8. Human Resource Management by A M Sarma – Himalaya Publishing
9. Managing Human Resources By Fisher- Cengage Learning
10. Human Resource Management By Dr. C.B. Gupta – Sultand Chand & Sons
11. Human Resource Management By Dipakkumar Bhattacharya: Excel Books
12. Human Resource Management By GarvyDessler.- Pearson/ Prantice Hall
13. Human Resource Management, Principles & Practice By P. C. Acquinas- Vikas Publishing.

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: II

Paper: 207:Marketing Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50hours

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1. Introduction to Marketing Management (17)

1.1. Market : Meaning, Definition & Types of market

1.2. Goods : Kinds of goods

1.3. Marketing

- 1.3.1.Definition, Objectives & Functions of marketing
- 1.3.2.Marketing approach : Production, Product, Selling, Marketing & Societal marketing
- 1.3.3.Marketing Process
- 1.3.4.Marketing Environment
- 1.3.5.Indian Marketing Environment
  - 1.3.5.1. Changing Demographic structure & Literacy level
  - 1.3.5.2. Rising Income & Reduction in Income Gap between Rural & Urban population
  - 1.3.5.3. Opportunities in Rural market
  - 1.3.5.4. Emergence of Service sector & Retailing
  - 1.3.5.5. Media explosion

1.4. Marketing Management

- 1.4.1.Definition, Nature & Scope
- 1.4.2.Functions
  - 1.4.2.1. Marketing research & Information
  - 1.4.2.2. Product & Pricing
  - 1.4.2.3. Planning & Control
  - 1.4.2.4. Promotion (Communication)
  - 1.4.2.5. Physical Distribution
- 1.4.3.Forms of Marketing Organization
  - 1.4.3.1. Functional
  - 1.4.3.2. Geographical
  - 1.4.3.3. Product or Brand oriented
  - 1.4.3.4. Customer oriented

1.5. Market segmentation

2. Marketing Mix (15)

2.1. Product

- 2.1.1.Meaning, Classification
- 2.1.2.Product Life Cycle
- 2.1.3.New Product Development
- 2.1.4.Product Related Strategies

2.2. Price

- 2.2.1.Meaning & Objectives of Pricing
- 2.2.2.Factors affecting Pricing decisions&Pricing Strategies

2.3. Place

- 2.3.1.Nature and importance of marketing channels, Channel Design Decisions
- 2.3.2.Logistics Management- Physical Distribution, Warehousing and Transportation
- 2.3.3.Retailing- Types of Retail Formats

2.4. Promotion

- 2.4.1.Promotion mix-Components, AIDA formula
- 2.4.2.Advertizing-Meaning, Importance, Types & Media plan
- 2.4.3.Sales promotion-Tools, Guidelines & Personal Selling

3. Consumer Behavior & Marketing Research (06)

1.1. Consumer behavior: Determinants of consumer behavior

1.2. Consumer decision making process/ Buying Process:

1.2.1.For Normal products: Need recognition, Information search, Evaluation of alternatives, Purchasing decision & post-purchase behavior

1.2.2.For New products: Awareness, Interest, Evaluation , Trial & Adoption

1.3. Organizational buyer decision process: Problem recognition, Product specification, Product & Vendor search, Product & Vendor evaluation, Product & Vendor selection & performance evaluation

1.4. Marketing Research: Meaning, Types & Process

4. Global Marketing (06)

4.1. Need, Importance&Problems in International Marketing

4.2. Levels of Involvement

4.3. Modes of Entry &Entry Strategies

4.4. Opportunity analysis

4.5. Global Brand

5. New trends in Marketing (06)

Concepts of -

5.1. Event Marketing

5.2. Emotional Marketing

5.3. Holistic Marketing

5.4. e-marketing

5.5. Agro Marketing

5.6. Non-Profit Marketing

5.7. Buzz Marketing

5.8. Green Marketing

5.9. Viral Marketing

5.10. Customer Relationship Management (CRM)

5.11. Legal Aspects and Marketing

5.11.1. Consumer Protection: Need, Importance,Consumer Education& Awareness

5.11.2. Act related to Maximum Retail Price: Labeling and Packaging

REFERENCE BOOKS:

1. Marketing Management by RajanSexena - Tata McGraw Hill
2. Principle of Marketing by Kotler& Armstrong – PHI/ Pearson , LPE 9th edition
3. Marketing Management –Arunkumar N. Meenakshi – Vikas Publishing
4. Marketing Management – Global Perspective, Indian Context (4/e) -Ramaswamy&Namakumari - Macmillan
5. Marketing Management – Text & Cases by S H HKazami – Excel Books
6. Marketing Management – Stanton – McGraw Hill
7. Marketing Management – Text & Cases by Tapan Panda – Excel Books
8. Marketing Management by S.A Sherlekar – Himalaya Publishing House
9. Marketing Management (Text & Cases in Indian Context)by Karunakaran– Himalaya Publishing House
10. Marketing: Marketing in 21st Century – Berman – Biztantra (Willy India Pvt. Ltd.)
11. Basics of Marketing Management –R.B. Rudani - S. Chand &Company Ltd.
12. Marketing- Grewal & levy - Tata McGraw Hill

North Maharashtra University, Jalgaon

(NACC Accredited 'B' Grade University)

FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: II

Paper:208: Quantitative Techniques

60 + 40 Pattern: External Marks 60 +Internal Marks 40 (Test Marks20 + Practical Marks 20) = Maximum Total Marks: 100

Required Lectures: 50hours

Section – I Statistics

1. **Basics of statistics** (03)
   - 1.1. Statistics – Meaning , Utility In Business Management
   - 1.2. Mean, Mode, Median and Their Relationship.
   - 1.3. Standard Deviation
2. **Correlation and Regression** (08)
   - 2.1. Meaning Of Correlation, Multiple Correlation and Partial Correlation.
   - 2.2. Meaning Of Positive, Negative And Perfect Correlation
   - 2.3. Scatter Diagram
   - 2.4. Karl Pearson's Coefficient Of Correlation
   - 2.5. Computation Of Correlation Coefficient For Ungrouped Data
   - 2.6. Meaning Of Regression, Simple Regression, Multiple Regression.
   - 2.7. Statement Of Regression Equations (Simple Regression)
   - 2.8. Meaning Of Regression Coefficients, Statement of Properties of Regression Coefficients.
   - 2.9. Coefficient of Determination.
   - 2.10. Numerical Problems from Real Life Situations.
3. **Probability** (05)
   - 3.1. Random and Non Random Experiments.
   - 3.2. Sample Space, Event, Sure Event, Impossible Event, Complementary Event, Mutually Exclusive Events.
   - 3.3. Classical Definition of a Probability, Computation of Probability.
   - 3.4. Conditional Probability, Computation of Conditional Probability.
   - 3.5. Statement of Addition and Multiplication Theorems of Probability.
   - 3.6. Computation of Probability Using the Theorems of Probability.
4. **Index Numbers** (04)
   - 4.1. Definition, Types, Uses of Index Numbers
   - 4.2. Methods of construction of Price Indexes
     - 4.2.1.Unweighted price Index : Single price index, Aggregate price Index
     - 4.2.2. Weighted Price Index: Weighted Aggregate Price Index -
       - 4.2.2.1. Laspeyre's Method
       - 4.2.2.2. Paasxhe's Method
       - 4.2.2.3. Fisher's Ideal Method
5. **Test of Significance** (08)
   - **5.1. $\chi 2$ –test (Chi-Square test)**
     - **5.1.1.** Chi-square distribution,
     - **5.1.2.** Properties of Chi-square distribution,
     - **5.1.3.** Conditions for Chi-square distribution
     - **5.1.4.** Application of Chi-square distribution,
     - **5.1.5.** Tests of goodness-of-fit
   - **5.2. T-test:** properties, uses, one sample t-test
   - **5.3. One way ANOVA**: meaning, Assumptions, (Simple problems)

Section-II Quantitative Techniques

1. **Quantitative Techniques for management &Co-Ordinate System** (03)
   - 1.1. Meaning, Field of Application
   - 1.2. Role of Quantitative Techniques in Business and Industries.
   - 1.3. Limitation of QT.

2. **Linear Programming Problems** (06)
   - 2.1. Meaning Of Linear Programming Problem, Feasible Solution, Decision Variable, Optimum Solution, And Objective Function.
   - 2.2. Advantages And Assumptions Of LPP
   - 2.3. Formulation Of LPP Problems
   - 2.4. Graphical Method to Solve Linear Programming Problem

3. **Decision Theory.** (08)
   - 3.1. Decision Making Problem
   - 3.2. Different Situations Of Decision Making: - Decision Under Deterministic Situation, Decision under Stochastic Situation, And Decision under Uncertainty.
   - 3.3. Maximax Criterion, Maximin Criterion, Minimax Criterion, Hurwitz Criterion, Laplace Criterion.
   - 3.4. Expected Monetary Value Criterion, Expected Regret Criterion.
   - 3.5. Expected Value Of Perfect Information
   - 3.6. Decision Trees.

4. **PERT and CPM** (05)
   - 4.1. CPM and PERT: Concepts, Advantages and Comparison and Limitations.
   - 4.2. Network Logic Construction Rules and Activity Relationship.
   - 4.3. Determination of Critical Paths.

REFERENCE BOOKS:

1. Business Statistics By S.C. Gupta & Indira Gupta – Himalaya Publishing House
2. Statistical Methods By S.P. Gupta – Sultan Chand & Sons
3. Business Mathematics by Kapoor&Sancheti – Sultan Chand & Sons
4. Business Statistics – Beri - Tata Mcgraw Hill
5. Mathematics & Statistics for Management by –Mittal, Satyaprasad&Rao- Himalaya Publishing House
6. Statistics for Management by - Anderson - Cengage Learning
7. Business Statistics by R S Bhardwaj – Excel Books
8. Statistics for Business and Economics (4/e) – Hooda - Macmillan
9. Quantitative Techniques by Vora – Tata McGraw Hill
10. Quantitative Techniques by L.C. Jhamb - Everest Publishing House
11. Operations Research by V.K Kapoor – Sultan Chand & Sons
12. Operations Research by Heera& Gupta – S.Chand& Sons
13. Quantitative Techniques by C.R. Kothari – Vikas Publishing House
14. Operations Research: Theory and Applications (4/e) J K Sharma Macmillan

2011

North Maharashtra University, Jalgaon

FACULTY OF COMMERCE & MANAGEMENT

Syllabus of Master in Business Administration (MBA)

SEMESTER: III

W.E.From 2011

North Maharashtra University, Jalgaon

(NACC Accredited 'B' Grade University)

FACULTY OF COMMERCE & MANAGEMENT

STRUCTURE OF MASTER IN BUSINESS ADMINISTRATION (M.B.A.)

Semester-I and II			
Paper	**Semester-I** **A : Credit Courses**	**Paper**	**Semester-II** **A : Credit Courses**
101	Management Science	201	Management Practices
102	Accountancy For Managers	202	Business Research Methods
103	Managerial Economics	203	Global Economic Scenario
104	Information Technology For Managers	204	Management Information System and ERP
105	Introduction To Operations Management	205	Financial Management
106	Organizational Behavior	206	Human Resource Management
107	Corporate Social Responsibility	207	Marketing Management
108	Corporate Communication Skills	208	Quantitative Techniques

Semester-III and IV			
Paper	**Semester-III** **Credit Courses**	**Paper**	**Semester-IV** **Credit Courses**
301	Strategic Management	401	e-Commerce & Excellence Management
302	Entrepreneurship & Project Management	402	Family Business Management
303	Legal Aspects Of Business	403	Indian Commercial Laws
304	Specialization-I (Major)*	404	Specialization-V (Major)*
305	Specialization-II (Major)*	405	Specialization-VI (Major)*
306	Specialization-III (Major)*	406	Specialization-VII (Major)*
307	Specialization-IV (Major)*	407	Project Report & Viva-Voce*
308	Specialization (Minor-I)**	408	Specialization (Minor-II)**

*Specialization In Major Subjects (Any One)		**Specialization In Minor Subjects (Any One)	
A	Financial Management	A	Financial Management
B	Marketing Management	B	Marketing Management
C	Human Resource Management	C	Human Resource Management
D	Operations Management	D	Operations Management
E	International Business Management	E	International Business Management
F	Agro Business Management	F	Agro Business Management
G	Systems	G	Systems

North Maharashtra University, Jalgaon

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

301: Strategic Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. Strategic Management: Overview **(15)**

a) Business policy- Nature, Importance, Objectives & Classification
b) Strategy: Meaning, Types, Components & Levels of strategy operations.
c) Business strategy: Concept, statement & Development
d) Strategic intent: Vision, Mission, Purpose, Goals and objectives, Values
e) Environmental Appraisal: Concepts and Environmental Scanning
f) Organizational Appraisal: Capability factors, Methods and Techniques
g) Strategic choice – Meaning, Process, Factors and Analysis – Portfolio and SWOT
h) Strategic management: Concept, Features, Risk, Benefits, Levels & Process
i) Strategic Innovation: Concept, Need, Importance & Analysis

2. Competitive Advantage **(06)**

a) Concept and sources of competitive advantage
b) Kinds of competitive advantage : Position and Capability and their inter-relationship
c) Sustainable competitive advantage
d) Cost-Benefit analysis of competitive advantage

3. Strategy Implementation **(10)**

a) Strategy Implementation: Aspects, Project & Procedural Implementation, Resource Allocation,
b) Structural Implementation – Structural Considerations, Structures for Strategy, Organization Design and Change, Organization Systems.
c) Behavioral Implementation – Leadership Implementation, Corporate Culture, Corporate Politics and Use of Power, Social Responsibility and Strategic Management, Personal Value and Ethics.
d) Functional Implementation of Strategies

4. Strategy Evaluation and Control **(07)**

a) Strategic Evaluation: Nature, Importance, participants, Barriers
b) Strategic control and operational controls.
c) Techniques of a strategic evaluation and control.

5. Comprehensive Cases on various strategic situations and at least 10 cases based on application of strategic management must be discussed & solved. **(12)**

REFERENCE BOOKS:

1. Business policy and Strategic Management - Azhar Kazmi-TMH
2. Marketing Strategy & Compitative Positioning by Hooley – Pearson Education
3. Business policy and Strategic Management : Concepts and Applications,- Gupta, Gollakota, Shrinivasan-Prantice Hall India
4. Strategic Management – Hunger, Wheelen – Addison Weesley
5. Strategic Management-P.Subba Rao – Himalaya Pub.
6. Strategic Management – Upendra Kachru- Excel Books
7. Strategic Management-Francis Cherunilam – Himalaya Pub Strategic Management-Saloner, Shepard, Podolny – Willey India
8. Strategic Management – B Hiriyappa – New Age International
9. Strategic Management – V.S.P. Rao, Harikrishna – Excel Books
10. Textbook of Strategic Management Mathur Macmillan

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

302: Entrepreneurship & Project Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Entrepreneur and Entrepreneurship (06)

a) Entrepreneur - Concept, Functions, Types, Characteristics, Qualities and Role – Ideal Entrepreneur
b) Entrepreneur vis-à-vis Professional Manager, Intrapreneur, Copreneur
c) Distinction between wage employment, self employment & Entrepreneurship
d) Entrepreneurial Competencies
e) Entrepreneur and Entrepreneurship – Factors, Barriers & Problems and Process of Entrepreneurship
f) Growth of Entrepreneurship in India

2) Entrepreneurship Development (14)

a) Entrepreneurship Development: Concepts, Factors affecting, Development Cycle and Strategy
b) Entrepreneurship Development Program (EDP): Concepts, Objective, Contents, issues, Phases, Evaluation. Institutions conducting EDP's in India
c) Entrepreneurship Development Training: Importance, Objective, Methods
d) Role of Institutions in Entrepreneurship Development - District Industrial Centre (DIC), Small Industries Services Institute (SISI), Entrepreneurship Development Institute of India (EDII), National Institute of Entrepreneurship and Small Business Units Development (NIESBUD), National Entrepreneurship Development Board **(**NEDB)
e) Role of Central and State Government in Entrepreneurship Development

3) Emerging areas in Entrepreneurship (07)

a) Women Entrepreneurship: Types, Challenges, Opportunities, Achievements, Problems, Remedial Measures & supporting Institutions and Role Models of Woman Entrepreneurs in India, Self Help Groups,
b) Rural Entrepreneurship: meaning, need, Problems, Development, Role of NGO's, Entrepreneurship in agriculture, TRYSEM.
c) Social Entrepreneurship: Genesis & Characteristic
d) International Entrepreneurship
e) E- Entrepreneurship: Concept, Purpose and Essence.

4) Project (09)

a) Project : Concept, Classification, Identification, Project Design, Project Appraisal, Project Planning,
b) Formulation of Project Report - Cost Benefit Analysis, Technical Feasibility, Financial Feasibility, Managerial Feasibility, and Market Survey.
c) Financing of the Project – Sources of Finance
d) Role of Financial Institutions – Commercial Banks, IDBI, ICICI, SIDBI, SFC's, IFCI, NABARD, Venture Capital.

5) Project Management (14)

a) Project Management Life Cycle: Project Initiation, Planning, Execution, Closure
b) Project Monitoring and Control – Parameters, Process
c) Monitoring and Control of group of Projects
d) Techniques of Project Monitoring and Control – PERT, CPM, Network technique
e) Computer based Project Management
f) Integrated Project Management – Management of Project Finances, Materials – Production – Marketing – Personnel Management.
g) Project Audit

302: Entrepreneurship & Project Management

REFERENCE BOOKS:

Entrepreneurship

1. Dynamics of Entrepreneurship Development and Management – Vasant Desai, Himalaya
2. Entrepreneurship Development small business Enterprises – Poornima Charantimath - Pearson
3. Entrepreneurship, Robert D. Hisrich, Michal P. Peters, Tata McGraw-Hill Edition
4. Entrepreneurship by lall and Sahai, Excel Books
5. Entrepreneurship Development and Project Management by Neeta Baporikar, Hiimalaya
6. Entrepreneurship Development in India by Gupta, Srinivasan – Sultan Chand & Sons
7. Entrepreneurship Management by Aruna Kaulgud - Thomson
8. Entrepreneurship Development by S.S. Khanka – S. Chand
9. Patterns of Entrepreneurship by Jack M. Kaplan, Willey Publications
10. Entrepreneurship Development by Cynthia L. Greene, Cenage Learning

Project Management

1. Project Management by Gray, Larson – Tata McGraw Hill
2. Project Management by Vasant Desai- Himalaya
3. Textbook of Project Management Gopalakrishnan Macmillan
4. Project Management by Maylor - Pearson
5. Projects - Prasanna Chandra – CFM TMH Professional Series -Tata McGraw Hill
6. Project Management : Managerial Approach by Jack R. Mereditts and Samuel J. Mantel Jr., Willey Publications
7. Contemporary Project Management by Timothy J. Kloppenborg, Cenage Learning
8. Project Management and Control by Narendra Singh, Himalaya Publishing House
9. Project Management by Panneerselvam, Senthilkumar – PHI
10. Project Management by Nagarajan – New Age International

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

Paper: 303: Legal Aspects Of Business

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Law of Contract – **"Indian Contract Act, 1872"** **(6)**
   a) Introduction, Meaning, Definitions & Essentials of Contract
   b) Classification of Contract
      (i) Void, Voidable & Valid Contract
      (ii) Wagering Agreement, Contingent Contacts & Quasi-contracts
   c) Discharge of Contract
   d) Breach of Contract & Remedies
   e) Specific Contracts
      i) Indemnity & Guarantee
      ii) Agency
      iii) Bailment & Pledge

2) Law of Sale of Goods – **"Sale of Goods Act, 1930"** **(9)**
   a) Contract of Sale of Goods
      i) Its essentials & types of Goods
      ii) Distinction between 'Sale & Agreement to Sale'
   b) Condition & Warranties
      i) Difference between Condition & Warranty
      ii) Express & Implied conditions & warranties
      iii) Doctrine of Caveat Emptor
   c) Transfer of Property
      i) Rules regarding Transfer of Property
      ii) Transfer of Title & Transfer of Title by Non-owners
   d) Performance of Contract of Sale - Delivery, modes, rules etc.
   e) Unpaid seller & his rights
   f) Buyer's right against Seller
   g) Concept of Auction Sale

3) Law of Partnership – **"Partnership Act, 1932"** **(5)**
   a) Definition & Nature of Partnership - Partners, Firm & Firm Name
   b) Difference between Partnership & Company
   c) Kinds of Partnerships
   d) Rights & Duties of Partner
   e) Relations & Liabilities of a Partner as well as Firm to Third parties
   f) Dissolution
      i) Methods of Dissolution
      ii) Dissolution of Firm & Dissolution of Partnership

4) Law of Negotiable Instruments – **"Negotiable Instrument Act, 1881"** **(4)**
   a) Introduction, Definition & Characteristics
   b) Parties to Negotiable Instruments
   c) Specimen & its Essentials - Promissory Note & Bill of Exchange
   d) Cheque - Bearer & Crossed, Types of Crossing
   e) Holder & Holder in due course
   f) Rights/Privileges of Holder in Due course

5) Law of Environment Protection – **"Environment Protection Act, 1986"** **(4)**
   a) Scope & Object
   b) Pollution control -Air, Water & Environment
   c) Environmental Audit – Methodology

6) Intellectual Property Law – Patent, Copyright & Trade mark **(12)**
   a) **"The Patents Act, 2002"** **(4)**
      i) Application for Patent
      ii) Grant of Patent
      iii) Rights of Patentee
      iv) What inventions are not Patentable?
      v) Revocation of Patents

   b) **"Copyright Act, 1957"** **(4)**
      i) Introduction
      ii) Duration of Copyright protection
      iii) Registration of Copyright
      iv) Infringement of Copyright – Exceptions

   c) **"The Trade Marks Act, 1999"** **(4)**
      i) Introduction
      ii) Classification of Goods & Services
      iii) Procedure for registration of Trade Marks
      iv) Grounds for refusal of registration

7) Case studies in Legal Aspects of Business – Typical cases based on the above topics only. **(10)**

REFERENCE BOOKS:

1. Legal Aspects of Business by Akhileshwar Pathak – Tata McGraw Hill
2. Legal Aspects of Business by R.R.Ramtirthkar – Himalaya Publishing House
3. Mercantile Law by S.S. Gulshan – Excel Books
4. Mercantile & Commercial Law by Rohini Aggrawal – Taxman Publication

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

304 A – Management of Banks & Financial Services

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

Section – I Management of Banks

1) Introduction to Banking **(08)**

a) Banking System in India
b) Commercial banking Structure: Meaning, Role & Functions of the Banks
c) Liabilities & assets of the Banks
d) New Concepts in Banking: Retail Banking, Microfinance, Credit/ debit cards, ATM's, Online banking, Mobile Banking
e) Non-banking Financial Corporations: Role & Growth, Types of NBFC's, Regulations & RBI's control
f) Opportunities in banking
g) Quality of Customer services in commercial Banks
h) Latest in Banking
   i) Autonomy packages in Banks
   ii) Banking Cash transaction tax
   iii) Service tax on Financial Services
   iv) Dividend policy for Banks
   v) Corporate Debt Restructuring (CDR)
   vi) Depository systems – NSDL, Dematerialization

2) Co-operative Banking **(03)**

a) Meaning, Nature and Types
b) Governance & reforms in co-operative banking
c) State Co-op agriculture & Rural Development banks

3) Bank Management **(04)**

a) Objectives, Evolution, Scope & functional areas of bank Management
b) Functional areas: Deposit Mobilization, credit planning & Management, Asset Management, Liability Management, Liquidity Management, Investment Management, management legal department, office management,

4) Credit planning & Management **(10)**

a) Objective, Need, Importance
b) Maintaining Ratio as per RBI Directories
c) Credit Culture
   i) Financial Analysis Credit rating, Inter-firm Comparison, Project Appraisal,
   ii) Consortium Lending, loan Syndication,
   iii) Documentation, Disbursement
d) Priority Sector Lending as per the RBI directives
e) NPA management:
   i) Meaning, Impact, Identification
   ii) Recovery mechanism and management
   iii) Compromise proposals as per RBI directives
   iv) Securitization and other measures available
   v) Debt Recovery Tribunal (DRT) and Legal recourse
   vi) Provisioning required as per RBI directives

Section II – Financial Services

1) Financial Services : (03)

a) Meaning Significance, functions, features, constituents, problems,
b) Evolution of financial services in India

2) Insurance (03)

a) Insurance: Meaning, Principles & Roles
b) Types of insurance – Life (normal & health), General, Agricultural & Bancassurance, Re-insurance, Group insurance & micro-insurance. ,
c) Types of Policies
d) Regulatory framework in India, Claims

3) Mutual Funds (05)

a) Mutual funds: Meaning, Evolution, Performance & its measures, Advantages, Growth in India
b) Types of mutual funds Schemes, Regulatory aspects ,Financial risk
c) Open v/s Closed, Debt v/s Equity
d) Tax implications & transparency in MFs
e) Introduction to Hedge funds & Participatory notes

4) Merchant banking services (03)

a) merchant banking; Meaning, Scope, Functions
b) Set-up of merchant banking in India: Registration, issue Manager,
c) Merchant banking in India & its Future prospects.

5) Credit Rating (04)

a) Meaning, Evolution, Importance, Scope, Need, benefits & criticism of Credit rating
b) Credit rating process & framework
c) IPO rating
d) Credit rating agencies in India & its regulations

6) Capital markets (05)

a) Capital markets: functions, Structure: Primary & Secondary Market
b) Types Of Securities Traded, Stock Market In India
c) Investment in stocks
d) Various intermediaries in capital markets
e) Essential formalities in investing in Capital markets
f) Role of FIIs in capital markets

7) Regulatory framework (02)

Regulatory framework/governing guidelines of governing authorities in relation to the above mentioned financial services

REFERENCE BOOKS:

1) Introduction to Banking: Vijayaragavan Iyengar – Excel Books
2) Banking Theory & Practice (19th Ed.): K.C. & Lekshy Shekhar, Vikas Publication
3) Management of Banking & Financial System by Paul - Pearson
4) Merchant Banking & Financial Services – Dr. K Ravichandran - Himalaya
5) Indian Financial System' Dr. G. Ramesh Bapu, Himalaya Publishing House
6) E-Banking & Development Of Banks' Verma, Gupta, & Sharma, Deep &Deep
7) Indian Economy: Datta & Sunderam, (2009),S.Chand &Company
8) Indian Economy: Mishra &Puri (2009), Himalaya Publishing House
9) Banking and Economics Growth.- B. M L. Nigam
10) Law and Practice of Banking. - S.R. Davar

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

305 A –Tax Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Direct Taxes-I (25)

a) Introduction to The Finance Act

b) Basic concepts from The Income Tax Act 1961: Agricultural income, Assesses, Assessment year, Income, Person, Gross total income, Previous year, Capital and Revenue Receipts, Capital and Revenue Expenditure, Exempted Incomes, Residential Status.

c) Heads of Income

i) Income from Salary: Salary, Allowances, perquisites and retirement benefits, deductions, computation of salary income, Practical problems on computation of salary income, Deduction of tax at source.

ii) Income from Business: Depreciation and other permissible deductions, Disallowable expenses, income and expenses of illegal business, computation of Business income, Deduction of tax at source.

iii) Income from other sources: Specific income, deductions, grossing-up, computation of income from other sources, practical problems, Deduction of tax at source.

d) Deductions from Gross total incomes - Deductions available to individual under sections 80C, 80CCC, 80CCE, 80D, 80DD, 80E, 80G, 80GG, computation of total income. Practical problems.

e) Submission of return through Tax Return Prepares, Filing of Return in Electronic form, PAN, Self-assessment, Summary Assessment.

f) Tax Deducted at Source – Introduction, Provisions pertaining to TDS from Salaries, Interest on Securities, Interest other than Interest on Securities, Payment to Contractors and Sub-contractors, Commission and brokerage, Rent and Fees for Professional and Technical Services.

g) Duty of a person deducting tax, consequences of failure to deduct tax, TDS certificate, Furnishing statement of tax deducted and return. Tax Deduction Account Number.

h) Advance Payment of tax: Introduction, Liability for payment of Advance tax, computation, installments of advance tax and due dates, Interest for default.

2) Direct Tax-II (07)

a) Wealth Tax Act 1957 – Charge of Wealth Tax – Valuation Date – Location of Assets -Assets –Deemed Assets – Exempted Assets – Net Wealth – Computation of Net Wealth (Including Problems), Valuation of Assets - Return of Wealth

3) Central Excise (08)

a) Central Excise Act, 1944 and the related Rules, Central Excise Tariff Act, 1985

b) Nature of Excise duty, Basic concepts – Assessee, Goods and Excisable Goods, Classification of Goods, Factory, Manufacture & Production, Deemed Manufacture, Manufacturer, Sale & Purchase, Wholesale Dealer- Central Excise Tariff - Principles of Classification - Valuation of Excisable goods - Specific duty vs. Ad valorem duty - Maximum Retail Sale Price - CENVAT Credit - Registration Procedure, Computation of Duty payable, Payment of Duty, Interest on delayed payment of duty.

4) Service Tax (04)

a) Service Tax : Basic concepts, Exemptions and threshold limits, Valuation of Taxable Services, Payment of Service tax, Registration - Valuation – Furnishing of Return, An overview of taxable services

5) Sales Tax (06)

a) Central Sales Tax Act 1956 –

b) Important Terms and Definitions - Inter State Sale, Inter State Sale by Transfer of Documents, – Sale outside the State, Goods, Dealer, Sale, Sale in the course of Import, Sale in the course of Export, State

relevant to Dealer, Determination of Taxable Turnover - Registration - Declared Goods - Rates of Central Sales Tax, Various forms used - On-line application for these CST forms. Assessment and Returns under CST Act .

Note – The Academic Year of the examination shall be the Assessment Year for study of different provisions of the Act

REFERENCE BOOKS:

(Note – Latest editions of the books containing provisions relevant to the Assessment Year under study be referred.)

1. Students' Guide to Income Tax, Vinod K. Singhania Kapil Singhania - Taxmann Publications, New Delhi.
2. Income Tax: Law and Practice - N Hariharan – Tata Mcgraw Hill
3. Income Tax Law & Accounts, Mehrotra : Sahitya Bhavan, Agra.
4. Law and Practice of Income in India Bhagavati Prasad :, New Age International Publishers, New Delhi.
5. Direct Taxes - Dr. Girish Ahuja & Ravi Gupta Bharat Publications
6. Direct Taxes - T. N. Manoharan , Snow White Publications.
7. Indirect Taxes : V. K. SAREEN and MAYA SHARMA, Kalyani Publishers.
8. Indirect Taxes : V. S. DATEY – Taxmann Publications.
9. Central Sales Tax , Law and Practice – V. S. Datey - Taxmann Publications.
10. Students' Guide to Indirect Taxes : Yogendra Bangar, Vandana Bangar, and Vineet Sodhani – Aadhya Prakashan Pvt Ltd., Jaipur
11. Systematic Approach to Indirect Taxes – Dr Sanjiv Kumar – Bharat Law House Pvt. Ltd., New Delhi.
12. Service Tax : Law, Practice & Procedure – C. Parthasarathy, Sanjiv Agrawal – Snow White Publications Pvt. Ltd., Mumbai
13. A handbook on Service Tax (Law, Practice & Procedure) by C. Parthsarathy, Dr. Sanjeev Agrawal & Raja Chelliah
14. Government of India- Income Tax Manual
15. Income Tax Act and Latest Finance Act

North Maharashtra University, Jalgaon

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

306 A –Strategic Financial Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Management in Public Sector Undertaking: (04)

a) Role of Financial Advisor,
b) Financial Objectives,
c) Capital budgeting, Disinvestment,
d) Financial Reporting : Efficiency Audit, Propriety Audit

2) Financial Strategy and Planning (10)

a) Strategic Planning: Meaning , Process, Necessity
b) Strategic Financial Management: Meaning, Need,
c) Financial Planning Analyzing Financial Performance
d) Approaches to Financial Planning
e) Short – Term Financial Planning.
f) Strategic Decision Making Framework,
g) Interface of Financial Policy & Strategic Management ,
h) Balancing Financial Goals vis-à-vis Sustainable Growth

3) Turnaround Management (14)

a) Corporate Sickness:
   i) Definition, Causes & Symptoms of sickness,
   ii) The Magnitude
   iii) Different Interpretation of Sickness
   iv) Financial Management in Sick Units
   v) Prediction of Sickness, Revival of Sick Units.

b) Turnaround
   i) Types of Turnaround
   ii) Basic Approaches
   iii) Surgical vs. Humane
   iv) Phases in Turnaround Management.

c) Merger and Acquisition:
   i) Mergers & Acquisitions: Kinds, Motives, Reasons, Stages & Mechanics
   ii) Cost Benefits of Merger, Terms of Merger & Major Causes of M & A failures
   iii) Financial Frame Work
   iv) Merger as a Capital Budgeting Decision
   v) Legal and Tax Aspects
   vi) Post-Merger Integration Issue.

d) Takeovers,
   i) Kinds of Takeovers,
   ii) Joint ventures, Managing and acquisition,
   iii) Acquisition Vs. Take over
   iv) Codes and Procedures – Techniques, Defensive Strategies – Cross Boarder Deals.

4) Corporate Restructuring (10)

a) Corporate Restructuring : Meaning, Need, Areas, Implications, Techniques
b) Financial Restructuring : Steps, Financial Reconstruction
c) Portfolio Restructuring
d) Ownership Restructuring
e) Distress Restructuring
f) Strategic Alliances
g) Divestiture
h) Leveraged Buyouts
i) Sell Offs
j) Leveraged Recapitalizations

5) Strategic Cost Management (12)

a) Causes and Symptoms of Broken Cost System – Remedies
b) Importance of Cost Systems
c) Objectives of Cost Management Systems
d) Value Chain analysis
e) Strategy and Cost Management
f) Strategy Formulation and Cost System Design
g) Alternate Strategies
h) Cost of Quality and Long – Term Profitability
i) Activity Based Costing Principles
j) Activity Based Management – Target Costing & Strategic Control systems

REFERENCE BOOKS:

1. Strategic financial Management , Ravi M. Kishore, Taxmann Publication
2. Strategic financial Management, A. N. Sridhar , Shroff Publishers & Distributors Pvt. Ltd
3. Strategic Management' Sharplin McGraw Hill
4. Managerial Finance Weston J.Fred & E.F.Brigham; Drydon Press
5. Financial Management - Prasanna Chandra- Tata McGraw Hill
6. Financial Management and Policy' James. C. Van Horne - Pearson
7. Strategic financial Management, ICFAI Publication
8. Financial Services– 3rd Edition. M. Y. Khan, Tata McGraw Hill
9. Principles of Corporate Finance' Richard A. Brealey and Stewat C. Myers, Tata McGraw Hill.
10. Innovative Corporate Turnarounds' Pradip M. Khandwalla,, Saga Publications, New Delhi.
11. The fourth Eye', Pradip M. Khandwalla, Saga Publications, New Delhi.
12. Company Resource: How to Manage a Business Turnaround'- Khar baunder O.P. and Stallworthy E.A, ' (Heinemann, London).
13. Financial Management and Policy- Bhalla V. K.- Himalaya
14. Financial Management- I. M. Pandey – Vikas
15. Financial Management by Berk – Pearson
16. Principles of Financial Management-R. P. Rustagi.-
17. Financial Management Simplified – Prasun Rakshit – Elegant Books Pvt. Ltd., Kolkata

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

307 A – Financial Derivatives

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Introduction to Financial Derivatives **(08)**

a) Financial Derivatives: Meaning, need, Features, Types, Uses, Critiques
b) Derivative markets – participants & functions
c) Growth of Financial Derivatives in India
d) The regulatory framework of Derivatives trading in India

2) Futures & Forwards **(12)**

a) Financial Futures: Contracts & Types
b) Future Market: Functions & Operators
c) Forward contracts: Concept, Features & Classifications
d) Future Vs Forwards
e) Pricing of Future and Forwards
f) Hedging strategies – hedging with Stock Index Futures, types of members & margining System in India
g) Futures trading on BSE & NSE

3) Options Market & Pricing **(12)**

a) Options: Meaning, Need, Terminology, Valuation
b) Options v/s Futures
c) Types of Options contracts – Call & Put options, Covered & Uncovered options
d) Trading Strategies involving Options – basic Option Positions – margins – Options on stock indices
e) Option markets in India on BSE & NSE
f) Intrinsic value & Time value, Pricing at Expiration
g) Factors affecting Options pricing, Put-Call Parity Pricing Relationship
h) Pricing models – Introduction to Binomial Pricing model, Black Scholes Option Pricing model

4) Swaps **(08)**

a) Swaps: Concepts, Nature, Evolution, Features & Structure of Swaps
b) Types – Interest-rate Swaps, Currency Swaps, Commodity Swaps, Equity Swaps
c) Swap variant, Swap Dealer Role
d) Economic Functions of Swap transactions.

5) Hedging & Credit Derivatives **(10)**

a) Concept
b) Fixed Hedging with options - concepts
c) Naked & covered Positions
d) Strategies
e) Hedging option Portfolio
f) Credit Derivatives: Concept, feature, growth, Benefits & Credit derivatives in India

307 A – Financial Derivatives

REFERENCE BOOKS:

1. Financial Derivatives: Theory concepts & problems – S.L.Gupta – Prantice Hall India
2. Options, Futures & Other Derivatives - Hull C John – Pearson Educations Publishers
3. Derivatives And Risk Management - Jayanth Verma- Tata Mcgraw Hill
4. Futures Markets: theory & practice" – Sunil K Parmeswaran – Tata McGraw Hill.
5. Financial Derivatives – Bishnupriya Mishra ,Swaroop – Excel Books
6. Risk Management: insurance & derivatives – Kotreshwar - Himalaya
7. Derivatives Valuation & Risk Management – David Thomas, Dubofsky Miller - Oxford Publication
8. Financial Derivatives – An introduction to Futures, Forwards, & Options – Read Head – Prentice Hall of India
9. Derivatives – T.V.Somnathan - Tata McGraw Hill.
10. Financial Derivative & Risk Management – O.P.Agrawal – Himalaya Publication
11. Risk Management & Insurance Arunajatesan Macmillan

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

304 B – Marketing Research

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Introduction (07)

a) Marketing research: Meaning, Scope, Purpose, Uses, Limitations and Threats to Marketing Research
b) Marketing Research and Marketing Management
c) Business research and its application vis-à-vis marketing
d) Marketing research process
e) Marketing Intelligence system:
   i) Concept, Components, Scope, Significance
   ii) MIS and Marketing Decision Support System (MDSS)
f) Ethics in Marketing Research

2) Data Collection (06)

a) Primary Vs Secondary data
b) Use of internet for primary data
c) Uses, Advantages and Disadvantages of Secondary Data
d) Locating and Evaluating Secondary data
e) Sources of Secondary data: e-sources and other

3) Market Survey as a method of Data Collection (12)

a) Market survey: Nature, Meaning and Objectives of Market survey
b) Types of Market survey
c) Field work: Designing a Questionnaire / Conducting a Survey
d) Conducting Consumer Perception survey
e) Conducting Consumer Satisfaction survey
f) Conducting Concept Testing survey
g) Preparation of Report based on the conducted survey

4) Data Analysis Techniques and Interpretation (12)

a) Regression Analysis,
b) Factor Analysis,
c) Cluster Analysis,
d) Discriminant Analysis,
e) Conjoint Analysis,
f) Multi-Dimensional Analysis
g) The Interrelationship between Analysis and Interpretation
   i) Improper interpretation
   ii) Improper Analysis
h) The interpretative process

5) Specific Research Applications (13)

a) Continuous Marketing Research Techniques
b) Test Marketing
c) Advertisement Research: Promotion Research, Brand Equity Research, Brand Name testing
d) Industrial Marketing Research
e) Export Marketing Research
f) Sales Analysis forecasting
g) Pricing Research
h) Consumer Behavior Research
i) Rural Marketing

REFERENCE BOOKS:

1. Market research - G.C. Beri – Tata McGraw Hill
2. Marketing Research – Naresh Malhotra – Pearson
3. Marketing Research-Rajendra Nargundkar – Tata McGraw Hill
4. Marketing Research by S L Gupta – Excel Books
5. Marketing Research – Suja Nair - Himalaya
6. Marketing Research – Burns and Bush – Pearson
7. Marketing Research – Luck and Rubin – Prentice Hall Publications
8. Marketing Research, Concept & Cases – Cooper Schindler. – Tata McGraw Hill
9. Research for Marketing Decisions – Paul Green, Donald Tull, Gerald Albaurn - Prentice Hall Publications
10. Marketing Research by Ramanuj Majumdar –New age International
11. Marketing Research by D.M. Sarawte – Everest
12. Marketing Research Shajahan Macmillan

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

305 B – Promotion Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. Introduction to Promotion (08)

a. Basic concept of Promotion & Communication
b. Integrated Marketing Communication: Concept and Process, Marketing Communication mix; The value of IMC plans
c. Relationship Between study of consumer's behavior and IMC plan
d. Promotion and Marketing Mix
e. Branding: Brand Name, positioning and Brand equity
f. Promotion by NGOs.
g. Direct Marketing: Techniques, Utility and Limitations

2. Advertising (12)

a. Meaning, Features, Objectives, Importance, Limitations and Types
b. Difference between Advertising and Personal Selling
c. Audience selection
d. Advertising- Objectives, AIDA & DAGMAR,
e. Functions & Perspective
f. Classification of advertising
g. Creativity in advertising: Concept of Copy Theme & Appeal
h. Copywriting, Art direction and Production
i. Evaluation of Advertizing effectiveness
j. Advertising Budget:
    i. Meaning, Responsibility of Preparation, Process,
    ii. Factors influencing advertising budget
    iii. Methods of advertising budget

3. Other Promotional Media (08)

a. Media Decision: Types, Media Mix, Media selection Planning & Strategy & Factors to be considered
b. Print Media, Electronic Media, Outdoor & Transit supplementary Media
c. Other Media:
    i. Shop signs and Window display
    ii. Point of Purchase material
    iii. Sponsorship and Event marketing
d. Speciality advertizing and Co-marketing programs
e. Advertising Agency: Types, Functions, Advantages, Remuneration methods, Client Relationship

4. Promotion Management (09)

a. Promotion: Meaning, Capabilities and Limitations, Managing Promos, Strategic Use of Promos, Below-the-line activities
b. Sales Promotion:
    i. Meaning, Important, Target, Tools and Techniques of Promotion
    ii. Relationship between sales promotion and advertising
    iii. Development & Evaluation of the Sales Promotion program
c. Trade Promotion: Meaning, Objective and Utility
d. Consumer Promotion: Meaning, Schemes – Consumer premium, Conditional consumer Premium, Limitation Direct premium, and Evaluation
e. Dealer Promotion: Meaning, Schemes and Importance

5. Salesmanship (08)

a. Salesmanship: Definition, Prospecting and Problems
b. Selling process and skills for effective salesmanship, sales leads, sales presentations
c. Types of calls, effective selling techniques,
d. Role of relationship marketing in personal selling, tools for personal selling, value added selling.
e. Sales force management: Recruiting, Training, Evaluation, Motivation & Compensation

6. Public Relations (05)

a. Public relation and Advertizing
b. Types of PR activities
c. Public Relations tools
d. Corporate identity
e. Decision making in Public Relations

REFERENCE BOOKS:

1. Advertising – Sales & Promotion Management – S.A. Chunawala – Himalaya Publishing House
2. Advertising Management (Concept & Cases) – Manandra Mohan – Tata McGraw Hill
3. Advertising – Murthy Bhojana – Excel Books
4. Advertising and sales Promotion by Kazami, Batra –Excel Books
5. Marketing management- Philip Kotler – Pearson/PHI
6. Marketing management – Sherlekar - Himalaya Publishing House
7. Advertizing – Principles and Practice – Wells, Burnett, Moriarty – Pearson
8. Sales Management : Decision, Strategy and Cases – Still, Cundiff & Govoni – Pearson
9. Advertising & Personal Selling – Rajput & Vasishth – Himalaya Publishing House
10. Advertising & Promotion (An IMC approach) – Shimp – Cengage Learning
11. Fundamental of Advertising- Theory and Practice. S.A.Chunawala, K.C.Seth -Himalaya Publishing House

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

306 B – Services Marketing

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Introduction to Services (06)

a) Service: Concept, Characteristics, Components, classification & Packages
b) Service facility design & Layout, Product Vs Services
c) Service marketing: Concept, features, importance
d) Global & Indian trends emerging in service sector.

2) The seven P's of Service Marketing Mix (12)

a) Product Decision , Product-service Continuum
b) Pricing: Strategies & tactics, Capacity planning, Measures to respond to changes in demand, Reshaping demand using effective pricing.
c) Promotion: Setting Communication objective, Implication for communication strategies.
d) Physical Distribution:-Strategies for services, challenges in distribution, Role of Internet in distribution.
e) People: The key Role of Service employee, Service Marketing Training Strategies for Training & Develop.
f) Physical Evidence: Nature, Importance, Tangibilizing of Physical Evidence, and Self Service Technologies.
g) Process: Service as a process & as a system, Different aspects & management challenges, Strategies for managing inconsistency.

3) Strategic Marketing Management for Services (08)

a) Matching Demand & supply through capacity planning and segmentation –
b) Internal Marketing of services
c) External versus Internal orientation of services strategy Strategies for Reducing customer Defections,
d) C.R.M

4) Delivering Quality Services & Customer Satisfaction (08)

a) Service Quality: Meaning, Measurement, Total Service Quality Management, Managing people & technologies, Perceived quality, controlling quality
b) Causes of services quality gaps
c) The customers Expectation versus perceived service gap;
d) The customer Expectation versus perceived service gap;
e) Factors & technique to Resolve this gap- Gap; in services.
f) Service Quality Models
   (1) Palsuraman-Zeithamal-Bitner(PZB) Gap Model
   (2) SERVQUAL and SERVPERF
   (3) Gronzoos Model
g) The services performance gap
h) Strategies for S.P.G. promise versus Delivery Gap.

5) Services Marketing Practices **(16)**

Concept, Classification & Implications of

a) Financial Services: Banking & Insurance
b) Healthcare Services
c) Hospitality Services
d) Travel & Tourism: Medical tourism
e) Professional Services
f) Public Utility Services
g) Education & Extension Services
h) IT & Communication Services: telecom, Courier
i) Media & Entertainment Service

REFERENCE BOOKS:

1) Services Marketing 2nd Ed- Rajendra Nargundkar,-Tata Mc Graw Hill companies
2) Services Marketing – S.M. Jha – Himalaya Publishing House
3) Services Marketing: People, Technology, Strategy- Christopher Lovelock - Pearson Education Asia
4) Services Marketing – Govind Apte - Oxford
5) Service Marketing: concept planning & Implementation – C Bhattacharya –Excel Books
6) Service Marketing- Raghu & Vasanthi Venugopal- Himalaya
7) Services Marketing – Ravi Shankar – Excel Books
8) Delivering Quality Services" The Free Press, Macmillam – Zeithaml, Parasuraman & Bery.
9) The Service Edge- Ron Zemke & Dick Schaaf
10) Thomas J Delong & Ashish Nanda: Managing Professional Services- Text and Cases, McGraw- Hill International, 2006.
11) Valerie Zeithaml & Mary Jo Bitner- Services Marketing- McGraw Hill

1) Introduction to International Marketing (12)

a) International Market: Meaning, Expansion, Growing Attractiveness
b) International Marketing: Meaning, Need, significance, Participants, Motives, Problems, Complexities, Decisions & Future
c) International Orientation & Stages
d) Scope of Marketing Indian Products Abroad
e) International market orientation- EPRG framework; International market entry strategies.
f) International Marketing Environment:
   i) Internal**,** External, Domestic, Economic, Social, Cultural, Demographic, Technological, Political and Legal
   ii) International Trading Environment
   iii) Trading Blocs & Growing Intra-Regional Trade
g) International Market Entry Strategies & Mode, Entry Strategies of Indian Firms

2) International Marketing Mix (30)

a) International Product Strategy:
   i) Levels & Hierarchy of product, Product-line analysis, Product design Strategy
   ii) Product Life Cycle Management,
   iii) New Product Development, Product Positioning & Product Adoption, Repositioning Strategies
   iv) Product planning Matrix, Dimensions of Product Strategies
   v) Product planning for global markets;
   vi) Standardization v/s Product adaptation;
   vii) Management of international brands: Brand Drivers
   viii) Packaging and labeling

b) International Pricing
   i) Role of Pricing, Objectives, Factors affecting Pricing, Pricing decisions
   ii) Pricing Methods, Pricing Strategies, Cost based pricing, Transfer pricing, Dumping, Export price structure, Skimming Pricing, Penetration Pricing, Price discounts, Discriminating Pricing
   iii) Price-Market relationship, Price Escalation: cost of exporting, Taxes, tariffs & Administrative costs, Exchange rate
   iv) Price control: Approaches to lessening price escalation, Leasing in international markets

c) International Promotions
   i) Promotion Decisions: Complexities and issues; International advertising
   ii) Marketing Environment & Promotional Strategies
   iii) Role of Export Promotion Organizations, Trade fairs and Exhibitions
   iv) International Marketing Communication: Major Decisions, Communication Mix, Problems in International Marketing Communication
   v) International Personal selling, Sales promotion and public relations.

d) International Distribution
   i) Distribution Channels: Policy, issues, Functions & types of channels;
   ii) International Channel conflict & Channel Decision
   iii) Functional Excellence in Distribution Planning
   iv) International logistics decisions & Management, Developing logistic Strategy

3) Export Management **(08)**

a) Managing Export Decisions
b) Export Contract: cost descriptions, risk coverage
c) Export procedure & Documentation, Modes of payment
d) Exit policy

REFERENCE BOOKS:

1. International Marketing: Text & Cases – Francis Cherunilam – Himalaya
2. International Marketing – Cateora, Graham, Salwan – Tata McGraw Hill
3. Global Marketing Management by Keegan - Pearson
4. International Marketing: Text And Cases - Justin Paul & Ramneek Kapoor – Tata Mcgraw Hill
5. International Marketing – Rajgopal – Vikas Publications
6. International Marketing – Rajendra Nargundkar – Excel Books
7. International Marketing – R Shrinivasan – Prantice Hall
8. Global Marketing: Foreign Entry, Local Marketing & Global Mgmt. – Johansson - Tata Mcgraw Hill
9. International Marketing & Export Management By Albaum - Pearson
10. International Marketing - Jain S.C. - CBS Publications, New Delhi
11. Marketing Management – Global Perspective, Indian Context (4/e) Ramaswamy & Namakumari Macmillan

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

304 C - Industrial Relations & Trade Union

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Industrial Relations- **(05)**

a) Concept, scope objectives, importance**;**
b) Developing sound industrial relations; industrial relations in India
c) Measures to Improve Industrial Relation

2) Industrial Discipline **(07)**

a) Concept, Objectives, Importance, Principles, Aspects, & Approaches of Discipline
b) The Red Hot Stove Rule
c) Procedure of Disciplinary Action (as per Industrial Employment (Standing order)act 1946)

3) Industrial Disputes- **(08)**

a) Concept, Manifestation of Conflict, Forms of Industrial Dispute
b) Causes & Consequences of Industrial Dispute
c) Dispute Settlement Machinery
d) Industrial Disputes in India
e) Prevention of Industrial Disputes

4) Grievance Procedure- **(10)**

a) Employee Grievance: Meaning, Nature, & Causes
b) Steps in grievance settlement; grievance machinery.
c) Mediation- Types and essentials of mediation
d) Conciliation-
   i) Types; preliminary steps towards conciliation;
   ii) Conciliation Officer- Qualities of a conciliator, role of conciliator
   iii) Conciliation procedure.
e) Arbitration- Types, Procedure.
f) Adjudication- Types, three tire system of adjudication.

5) Collective Bargaining & Negotiation **(08)**

a) Objectives & importance
b) Bargaining Strategies
c) Bargaining Process
d) Essentials of Collective Bargaining.
e) Importance of negotiation
f) Qualities of a good negotiator.

6) Trade Unionism- **(12)**

a) Types, role & importance
b) Recognition of Trade Union
c) Trade Union Movement in India
d) Problem of trade unions in India.
e) Measures for strengthening T U
f) White Collar & Managerial Trade Unions: Growth, Need & Nature of Managerial TU
g) The Trade Union Act 1926: Definitions, Registration, Duties, Rights & Liabilities of Trade Union

304 C - Industrial Relations & Trade Union

REFERENCE BOOKS:

1) Industrial Relations Trade Union & Labour Legislations by PRN Sinha & Shekher – Pearson
2) Industrial Relations & Labour Laws by B.D.Singh- Excel books
3) Industrial Relations by Arun Monappa – Tata McGraw Hill
4) Dynamics of Industrial Relations by C.B.Mamoria; Himalaya Publishing House
5) Industrial Relations of Developing Economy by Bishwanath Ghosh- Himalaya
6) Essentials of HRM & IR by P Subba Rao – Himalaya
7) Industrial Relations in India 2/e Sen Macmillan
8) Human Resource Management by S.S.Khanka; S. Chand & Co. Ltd. New Delhi.
9) Human Resource Management by K.Ashwathappa – Tata McGraw Hill

305-C: Labour Welfare and Administration

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100
Required Lectures: 50 hours

1) **Introduction** **(08)**
   a) Meaning, importance and objective of labour welfare.
   b) Types of welfare services
   c) Necessity and scope of labour welfare in India
   d) Agencies of labour welfare
   e) Qualification and role of labour officer

2) Social Security **(06)**
   a) Concept, scope, Objective, need.
   b) Types of social security
   c) Social security measures in India

3) Workers Participation in Management, **(08)**
   a) WPM-Definition, meaning and objective
   b) Forms of WPM
   c) Causes and failure of WPM
   d) Making worker participation effective
   e) WPM in India

4) Empowerment- **(08)**
   a) Meaning, coordination.
   b) Approaches of empowerment
   c) Characteristics of empowered organization.
   d) Forms of empowerment.
   e) Empowerment process.
   f) Barriers to empowerment.

5) Industrial hygiene **(06)**
   a) Working Condition.
   b) Lighting, temperature, humidity, noise, duel firms and radiations etc.
   c) Work behavior
      i) Industrial accidents and fatigue
      ii) Causes of accidents
      iii) Fatigue and effect of fatigue
      iv) Safety Programmer

6) Labour Costing **(08)**
   a) Labour cost, computations and controls.
   b) Absenteeism and labour turn over-Cost, causes and determination.
   c) Labour productivity: Labours study and times study
   d) Treatment of overtime. Ideal time. Night shift, allowances, leaves pay.

7) India & International Labour Organization **(06)**
   a) Objectives, Structure of ILO
   b) Impact of ILO on India Labour
   c) Recommendations of ILO

305-C: Labour Welfare and Administration

Reference Books:

1. Human Resource Management by Ashwathapa – Tata McGraw Hill
2. Labour Welfare Trade Union & Industrial Relations by Punekar, Deodhar & Sankaran - Himalaya Publications
3. Human Resource Management by S.S.Khanka – S. chand & Sons
4. Essential of HRM and Industrial Relations by P.Subha Rao – Himalaya Publications
5. Human Resource Management by Gary Dessler – Pearson
6. Human Resource Management by C.B.Gupta – Sultan Chand & Sons
7. Human Resource Management by Chhabra – Dhanpat Rai & Sons
8. Industrial Relations by Arun Monappa – Tata McGraw Hill
9. Human Resource Management by A.M Sharma – Himalaya Publications
10. Human Resource Management by V.S.P Rao – Excel Books
11. Human Resource Management by Snell Bohlander - Cengage
12. Human Resource Management by Mondy - Pearson

306-C: Strategic and e-Human Resource Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100
Required Lectures: 50 hours

1) **Effective Management of People** **(07)**
   a) System of HR & Organization's Performance
   b) Managerial approach vis-à-vis Change agent
   c) Strategic HR Vs Traditional HR
   d) Role of HR during
      i) Organizational growth
      ii) Retrenchment
      iii) Organizational Turnaround

2) **Strategic Human Resource Management** **(09)**
   a) Introduction, Meaning, Definition of SHRM
   b) Importance & Steps in SHRM
   c) Barriers to Strategic HR
      i) HR & Organizational Strategies
      ii) HR & Corporate Strategy
      iii) HR & Business Strategy
      iv) HR Strategy Framework
   d) Strategic Procurement, Strategic Recruitment & Strategic Staffing

3) **Strategic Job Analysis, Job design & Redesigning of Work System** **(12)**
   a) Concept, Process & Method of Job Analysis
   b) Meaning, Issues & Concept of - Job Description, Job Specification & Job Analysis
   c) Modern Management Techniques
   d) Designing of work Systems
   e) Organizational Design Process & Factors affecting Design Process
   f) Emerging issues in Organizational Design
   g) Goal Setting
      i) Meaning of Goal Setting
      ii) Requisites of Goal setting & its relationship with Vision & Mission
      iii) Approaches, Process & Characteristic of Goal setting

4) Strategic Performance Management **(08)**
   a) Ethical Issues in Strategic HRM
      i) Core Concepts & Ethics at Work place
      ii) Ethical Issues in Labour Management relations & Conflict of Interest
   b) Strategic Dimensions of Performance Appraisal
   c) A Shift from Appraisal to Performance Management
      i) Balance Score Cards & Its Importance
      ii) Economic Value Added

5) Developing HR as Strategic Value addition Function **(07)**
   a) Gaining competitive Advantage through HR
   b) HR as a Strategic Business Partner
   c) The VRIO Framework
   d) Changing role & Future Challenges of HR

6) Strategic HR & Information Technology **(07)**

a) Technologies Affecting HRM
b) HR Innovations
c) Conventional HRM to Web Based HRM
d) Various Application Software for HR Practices

REFERENCE BOOKS:

1. Strategic Human Resource Management by Jeffrey Mello.- Cengage Learning
2. Strategic Human Resource Management by Rajeesh Viswanathan – Himalaya
3. Strategic Human Resource Management by Greer - Pearson
4. Strategic Human Resource Management by Armstrong – Kogan Page
5. Strategic Human Resource Management by Rajib Dhar – Excel Books
6. Strategic Human Resources Management Prasad Macmillan
7. Human Resource Strategy by Dreher & Dougherty – Tata Mcgraw Hill
8. Human Resource Management, 10/e by Mondy Wayne – Pearson Education
9. Managing Human Resources By Fisher- Cengage Learning

North Maharashtra University, Jalgaon

(NACC Accredited 'B' Grade University)

FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

307 C – HR Legislations

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Factories Act, 1948 **(06)**

a) Object & Definitions
b) Health Provisions
c) Safety Provisions
d) Welfare Provisions
e) Obligations of Worker & Occupier
f) Offences & Penalties

2) Apprentice Act, 1961 **(04)**

a) Object & Definitions
b) Obligation of employers,
c) Obligations & Rights of apprentices.
d) Contract of Apprenticeship

3) Minimum wages Act, 1948 **(05)**

a) Object, Applicability & definitions
b) fixation of minimum rate of wages
c) Procedure for fixing and revising minimum wage,
d) Offences & Penalties
e) Obligations of Employers

4) Payment of wages Act, 1926 **(05)**

a) Object, Applicability & definitions
b) Time of payment of Wages.
c) Deductions from wages.
d) Obligations of Employers & Employees.
e) Offences & Penalties

5) Payment of Bonus Act 1965 **(06)**

a) Object, Applicability & definitions
b) Calculation of Bonus,
c) Time limit for payment
d) Eligibility for Bonus
e) Amount of Bonus , Claim for Bonus, exemption
f) Calculation of allocable surplus,
g) Set-on and set-off of allocable surplus

6) Workmen's Compensation Act, 1923. **(05)**

a) Object, Scope & definitions
b) Liability of employers
c) Amount of Compensation
d) Obligations of Workmen & Employer
e) Distribution of Compensation
f) Occupational diseases
g) Penalties

7) Contract Labour (Regulation & Abolition) Act, 1970. **(05)**

a) Object, Applicability & definitions
b) Prohibition of Contract Labour
c) Registration & Licensing of contractors
d) Welfare of Contract Labour
e) Obligations of principal employer & contractor

8) Employees state insurance Act, 1948 **(04)**

a) Object, Scope & definitions
b) Obligations of Employers & Employees.
c) Contribution
d) Benefits to employees

9) Maternity Benefit Act 1961 **(06)**

a) Object, Applicability & definitions
b) Right to payment of maternity benefit
c) Forfeiture of maternity benefit
d) Payment of maternity benefit in case of death of a woman
e) Payment of medical bonus
f) Leave for miscarriage
g) Leave for illness arising out of pregnancy, delivery, premature birth of child, or miscarriage
h) Nursing breaks

10) The Child Labour (Prohibition & Regulation) Act 1986 **(04)**

a) Object, Applicability & definitions
b) Prohibition of Child Labour
c) Regulation of Conditions of Child
d) Offences & Penalties

REFERENCE BOOKS:

1. Labour Laws by B.D.Singh – Excel Books
2. Industrial Jurisprudence and Labour Legislation by A.M.Sharma – Himalaya Publications
3. Elements of Merchantile Law by N.D.Kapoor – Sultan Chand & Sons
4. Industrial Relations, Trade Unions & Labour Legislation by PRN Sinha, Indu Sinha, Seema Shekhar – Pearson
5. Labour Laws – Bare Acts

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

304 D – World Class Manufacturing & Process Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Manufacturing Management **(04)**

a) Manufacturing activity scheduling
b) Manufacturing resource planning
c) Current Trends in Manufacturing in India

2) World Class Manufacturing **(08)**

a) Characteristic of Re-engineered process.
b) Managerial responsibility in globalization :
c) Software in use, Problems of implementation on the system.
d) Optimized Production Technology (OPT),
e) Automation in Design and manufacturing, Role of Robotics etc.
f) State of International Business – Managerial Attitude and Challenges.
g) Environment Pollution – Factors, Effect and Control.

3) Innovative Manufacturing System **(10)**

a) Lean Manufacturing: Concept, Tools & Techniques, Advantages And Disadvantages
b) Flexible Manufacturing System: Different production system of FMS & its Configuration
c) Group Technology: Concept & applications of GT
d) Cellular Manufacturing System: Concept
e) Agile Manufacturing: Concept
f) Computer Integrated Manufacturing (CIM) : Concept

4) Process Management **(10)**

a) Processes: Meaning, Types & Scope
b) Process planning and selection
c) Process design: Scope, Factors affecting and operation design
d) Major process decisions
e) Process analysis and process flow charts
f) Process Improvement: Methods – Kaizen Umbrella, Process Management tools
g) Process Management tools & Techniques: Design of Experiments (DOE), Taguchi Method, Quality Function Deployment (QFD), Single Minute Exchange of Die (SMED), Visual Control (VC)
h) Product Design Concepts: Design for manufacture (DFM), Design for Assembly (DFA), Design for Operations (DFO)

5) Maintenance Management **(08)**

a) Maintenance Function and Strategies
b) Maintenance economics
c) Spare Parts Management: Types of Spares & Inventory Planning for Spare Parts
d) Measurement of Maintenance performance:
   i) Total Productive Maintenance
   ii) Concept of Reliability, Reliability Improvement
   iii) Concept of Maintainability, Maintainability Improvement.

6) Management of Industrial Safety **(06)**

a) Safety Analysis
b) Safety programs and organization
c) Safety and productivity
d) Causes, problems and sources of industrial accidents
e) Theory of accident occurrences
f) Accident prevention and control
g) Investigation and Analysis of accident
h) Duties of plant supervisor and safety inspector
i) Welfare and safety

7) Technology Transfer **(04)**

a) Definition and Classifications
b) Channels of technology Flow
c) International Technology Transfer
d) Intra-firm Technology Transfer

REFERENCE BOOKS:

1. Production and Operations Management by N.G. Nair – Tata McGraw Hill
2. Production & Operations Management by Upendra Kacharu – Excel Books
3. World Class Manufacturing Sahay Macmillan
4. Operations Management by B Mahadevan – Pearson
5. Global Management Solutions-Demystified – Seth, Rastogi – Thomson Press
6. Total Quality Management: Text & Cases – K Shridhara Bhat - Himalaya
7. Production and Materials Management by K. Shridhar Bhat –Himalaya
8. Management of Technology by Tarek Khalil - TMH
9. Production and Operation Management by Kanishka Bedi – Oxford
10. Operation management by Ray wild – Thomson
11. Production and Operation Management by Chunnawala Patel - Himalaya
12. Materials and Purchasing Management by S.A. Chunawala – Himalaya

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

305 D – MANAGEMENT OF TECHNOLOGY

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. **Introduction to Technology Management:** **(08)**
   a) Concept and meaning of technology,
   b) Evolution and growth of technology,
   c) role and significance of management of technology,
   d) Impact of technology on society and business,
   e) Forms of technology: process technology and product technology.

2. **Competitive advantages through new technologies:** **(08)**
   a) Product development – from scientific breakthrough to marketable product –
   b) Role of Government in Technology Development.
   c) Linkage between technology, development and competition,
   d) Managing research and development (R&D),
   e) Managing Intellectual Property.

2) **Technological Forecasting:** **(08)**
   a) Exploratory: Intuitive, Extrapolation, Growth Curves,
   b) Technology Monitoring, Normative: Relevance Tree, Morphological Analysis, Mission Flow Diagram

3) **Technology Assessment:** **(08)**
   a) Technology Choice, Technological Leadership and Follower ship,
   b) Technology Acquisition. Meaning of Innovation and creativity,
   c) innovation management

4) **Technology strategy**: **(06)**
   a) concept, types, key principles, framework for formulating technology strategy,
   b) Technology forecasting: techniques and application.

5) **Technology diffusion and absorption**: **(06)**
   a) Rate of Diffusion; Innovation Time and Innovation Cost,
   b) Speed of Diffusion.
   c) Project management in adoption and implementation of new technologies.

6) **Technology Transfer Management**: **(06)**
   a) Technology transfer-process;
   b) outsourcing strategic issues; joint ventures,
   c) Technology sourcing.

7) **Human Aspects in Technology Management:** **(05)**
   a) Integration of People and Technology,
   b) Organizational and Psychological Factors,
   c) Organizational Structure.

8) **Social Issues in Technology Management:** **(05)**
   a) Technological Change and Industrial Relations,
   b) Technology Assessment and Environmental Impact Analysis.

305 D – MANAGEMENT OF TECHNOLOGY

REFERENCE BOOKS:

1) Management of Technology - Tarek Khalli - McGraw-Hill.
2) Managing Technology and Innovation for Competitive Advantage - V K Narayanan - Pearson Education Asia
3) Strategic Technology Management - Betz. F. - McGraw-Hill.
4) Strategic Management of Technological Innovation - Schilling - McGraw-Hill, 2nd ed.
5) Strategic Management of Technology & Innovation - Burgelman, R.A., M.A. Madique, and S.C. Wheelwright -. Irwin.
6) Handbook Of Technology Management - Gaynor - Mcgraw Hill
7) Managing New Technology Development - Souder, W.C. and C.M. Crawford - McGraw-Hill.
8) Managing Technological Innovation - Twiss, B. -. Pitman.
9) Bringing New technology To Market - Kathleen R Allen - Prentice Hall India
10) Management Of New Technologies For Global Competitiveness — Christian N Madu - Jaico Publishing House

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

306 D –Logistic & Supply Chain Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Supply Chain Management **(16)**

a) Concept, Supply Chain Linkage
b) Mapping the supply chain
c) E-Business solution for supply chain
d) Supply chain Flows
e) Cycle View of Supply Chain
f) Process cycle time
g) Supply Chain Relationships: Supplier-Buyer relationship
h) Functional Strategies that impact SCM performance
i) Parameters for SCM Design
j) Information Functionality of Supply Chain
k) Principles of Supply chain Information
l) Information System activity
m) Technology Used in SCM

2) Logistic Management **(06)**

a) Definition, Objective Functions & Scope
b) Customer value chain
c) Logistical competence, competitiveness and competitive advances
d) Logistic for business excellence
e) Logistic solution
f) Role of Logistic in Supply Chain

3) Customer Service And Demand Management **(06)**

a) Relationship between customer and demand management
b) Customer service for competitiveness
c) Customer service phase
d) Service attributes
e) Customer service strategy
f) Value added logistical service

4) Logistic Planning And Strategy **(06)**

a) Hierarchy of planning
b) Relationship between logistic strategy and corporate strategy
c) The strategic logistic plan and audit
d) Logistic mission and objectives
e) Logistic Strategies & Formulation
f) Designing Logistical system

5) Logistic Mix **(16)**

a) Warehousing
   i) Concept & Functions
   ii) Warehouse Options
   iii) Warehouse Site Selection & Layout Design
   iv) Warehouse Costing
   v) Warehousing Strategies
   vi) Warehousing in India

b) Material Handling Systems
   i) Role of Material Handling
   ii) Material Handling Guidelines

c) Material Storage Systems
   i) Concept
   ii) Storage Principles
   iii) Benefits of Storage Design
   iv) Storage Methods

d) Transportation
   i) Transportation Infrastructure
   ii) Freight Management
   iii) Factors influencing Freight cost
   iv) Transportation Network
   v) Route Planning
   vi) Containerisation

e) Logistical Packaging
   i) Consumer Vs Logistic Packaging
   ii) Packaging as Unitisation
   iii) Design Considerations
   iv) Packaging Materials
   v) Returnable Logistic Packaging
   vi) Packaging Cost

f) Logistic Information system (LIS)
   i) Logistic Information Needs
   ii) Designing Logistic Information system
   iii) Desired Characteristic of LIS

REFERENCE BOOKS:

1. Logistic Management by V.V.Sople- Pearson
2. Logistic & Supply chain management by K.Shridhara Bhat – Himalaya
3. Exploring the supply chain by Upendra kachru – Excel books
4. Supply Chain Logistics Management - Donald Bowersox , David Closs, M. Bixby Cooper – Tata McGraw Hill
5. Supply chain management by Janat Shah - Pearson
6. Logistical Management by Donald Bowersox , David Closs – Tata McGraw Hill
7. Supply chain management Concept and cases by Rahul V. Altekar - PHI
8. Operations Management along the Supply chain by Russell & Taylor - WILEY-INDIA
9. Supply Chain Management - Text, Cases and Best Practices by Agrawal -Macmillan

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

307 D –Operations Research

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Introduction to Operations Research **(05)**

a) Definitions, characteristic & Scope of Operations Research
b) Role of Operations Research in Managerial D/M
c) Role of Computers in OR
d) Limitations of OR

2) Transportation Model **(06)**

a) Formulation of Transportation Problem.
b) Methods of Finding Initial Solution.
   i) North-West corner rule
   ii) Row Minima Method
   iii) Column Minima Method
   iv) Least Cost Method
   v) Vogel's Approximation Method

3) Assignment Model **(05)**

a) Comparison with Transportation Model
b) Formulation of Assignment Model
c) Hungarian or reduced Matrix Method

4) Theory of Games **(10)**

a) Competitive Games
b) Terminology
c) Rules for games theory
d) 2X2 Games, 2X3 Games, 3X3 Games

5) Sequencing Problem **(06)**

a) Processing n jobs through two machines
b) Processing n jobs through three machines
c) Processing Two jobs through m machines

6) Replacement Decisions **(05)**

a) Replacement of Item Deteriorates with time
b) Replacement of Item Whose Maintenance cost Increase with Time and value of Money

7) Investment Analysis **(08)**

a) Break even analysis
b) Payback Period Method
c) Average Rate of Return Method
d) Discounted Cash Flow Method

8) Simulations **(04)**

a) Meaning of Simulation
b) Reasons for using Simulation
c) Advantages & Limitations of Simulation
d) Monte Carlo Method of Simulation(Theory only)

REFERENCE BOOKS:

1. Operations Research: Theory and Applications (4/e) Sharma Macmillan
2. Operations Research by V.K.Kapoor - Sultan Chand & Sons
3. Operations Research by D.S Heera & P.K.Gupta - S.Chand & Sons
4. Quantitative Techniques in Management by Vohra - Tata McGraw Hill Company
5. Operations Research by Natarajan - Pearson
6. Quantitative Techniques in Management by Jaishankar – Excel Books

Specialization – E – International Business Management

North Maharashtra University, Jalgaon

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

304 E – International Business

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Introduction to International Business (IB) (06)

a) Concept of International Business
b) International Vs Domestic Business
c) Evolution, Development & Factors leading to Growth of IB
d) International Orientation
e) Globalization of Business Structure

2) Modes of International Business (06)

a) Determinants of Entry Mode
   i) country-specific,
   ii) Industry-specific,
   iii) Firm-specific,
   iv) Project-specific
b) Entry Mode Selection & Choices
   i) Trade Related
   ii) Contractual
   iii) Investment Based

3) Theories of International Trade (06)

a) Mercantilism
b) Theory of Absolute cost Advantage
c) Comparative cost Advantage Theory
d) Comparative cost Advantage Theory with Money
e) Country Similarity Theory
f) Global Strategic Rivalry Theory
g) Factor Proportions Theory
h) Product life Cycle Theory
i) Porter's National Competitive advantage Theory

4) International Business Environment (09)

a) Meaning of IB Environment, IB Environmental Factors
b) Socio-cultural & Ethical Environment
c) Economic Environment
d) Political Environment
e) Technological Environment

5) International Business Strategies (12)

a) Strategy: Role & Choices
b) Strategy formulation: Approaches, Spectrum, Levels

c) Planning, Organization & Control
d) International Marketing Strategy
e) International Investment & Financing Strategy
f) International HRM Strategies

6) Global Trade & Investment (11)

a) World Trade Organization
   i) Establishment of WTO
   ii) Organization Structure of WTO
   iii) Anti Dumping Measures
   iv) Dispute settlement Mechanism
   v) TRIMS & TRIPS
   vi) WTO & India
b) Conflict & Negotiations in IB
   i) Factors causing Conflict
   ii) Host Country Vs Transnational Corporations
   iii) International Negotiations
   iv) Role of International agencies in Conflict resolution
c) Foreign Direct Investment (FDI)
   i) Concept, Reasons & Trends in FDI
   ii) Costs, Benefits & Determinants in FDI
   iii) Theories of FDI
      (1) Industrial Organisation Theory
      (2) Product Cycle Theory
      (3) MacDougall-Kemp Hypothesis
      (4) Location-specific Theory
   iv) Foreign Direct Investment In India

REFERENCE BOOKS:

1) International Business: concept Env. & Strategies – Vyuptakesh Sharan – Pearson

2) International Business: K. Ashwathappa - Tata McGraw Hill

3) International Business – Hill & Jain – Tata McGraw Hill

4) International Business: Text & Cases – P. Subba Rao – Himalaya

5) International Business: concept Env. & Strategies – Sumati Varma – Ane Books

6) International Business – Shajahan - Macmillan

7) International Business – Shyam Shukla – Excel Books

8) International Business Environemt & Management: V.K. Bhalla – Anmol Publications

9) International Business- O.P.Agrawal - Himalaya

10) International Business – Justine Paul – Prantice Hall

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

305 E – International Finance

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Fundamental of International Finance **(06)**

a) Nature, Scope, Dimension & Importance of International Finance
b) Domestic Vs International Finance
c) Recent changes in Global Financial markets.
d) Globalization & international Financial Management
e) Emerging challenges & Responsibilities of finance Manager

2) International Monetary system **(09)**

a) Evolution of International Monetary System
b) Alternative Exchange Rate Regime
c) International Monitory Fund (IMF) classification for exchange Rate Regime
d) Selection & management of exchange Rate Regime
e) Monetary Policy & exchange Rate policy
f) Emergence of Euro
g) Exchange rate of Indian Rupee
h) Convert ability & Currency
i) Sterilization

3) Balance of Payment **(05)**

a) Structure of Balance of Payment
b) Function, Principles & Accounting of Balance of Payment
c) Equilibrium & Disequilibrium
d) Adjustment & Approaches to Adjustment
e) Balance of Payment and Exchange Rate
f) India's Balance of Payment

4) International Parity **(07)**

a) Exchange Rate Determination
b) Factor Affecting Exchange Rate
c) Purchasing Power Parity (PPP) theory of Exchange.
d) Real Exchange Rate & Real Effective Exchange Rate
e) Interest Rate & Exchange Rate
f) Covered Interest Rate & Interest Rate Parity, Forward Rate Parity
g) The Fischer Effect
h) Exchange Rate Forecasting

5) The Foreign Exchange Market **(10)**

a) Structure of foreign Exchange Market
b) Market Participant & market makers
c) Market segment

d) Markets for Currency Options & Futures
e) Foreign Exchange Rate
f) Arbitrage- Two Point & Triangular Arbitrage
g) Forward & future spot rate
h) International Transaction Mechanism – Nostro, Vostro and Loro Account, SWIFT, CHIP, CHAP, Telegraphic Transaction (IT)
i) The Indian Foreign Exchange Market.

6) Financial Decisions of Multinational Corporations (08)

a) Generalised trade theory
b) MNCs: Definition, rationale, Merits & Demerits, Role & impact
c) Cost of Capital: Meaning & Factors, Difference between Cost of capital for MNCs & Domestic firm
d) Capital structure decisions
e) Operational Strategies of MNCs: Change Strategy, technology adaption, quality improvement & control, Mergers & Acquisition
f) Sources of Funds for MNCs: long term & short term

7) International Financial Institutions (05)

a) International Bank for Reconstruction and Development
b) International Development Association
c) International Finance Corporation
d) Asian Development Bank
e) International Monetary Fund

REFERENCE BOOKS:

1) International Finance Management by Thumuluri Siddaiah (IFM) - Pearson
2) International Finance Management by P. G. Apte - Tata McGraw Hill
3) International Finance Management by vyuplesh saran – Prentice Hall
4) International Finance by Maurice D. Levi - Routledge
5) International Finance Management by V.A. Avadhani – Himalaya Publishing House
6) International Finance Management by V.K Bhalla - Anmol Publications
7) International Finance Management by O.P.Agrawal - Himalaya Publishing House
8) International Finance Management by Cheol S. Eun & Bruce G Resnick , Tale McGraw Hill
9) International finance Marketing by N. R. Machiraju – Himalaya Publication
10) International Finance Management by K. Aswasthapa- Tata McGraw Hill

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

306 E –International Logistic & Supply Chain Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Supply Chain Management **(16)**

a) Concept, Supply Chain Linkage
b) Mapping the supply chain
c) E-Business solution for supply chain
d) Supply chain Flows
e) Cycle View of Supply Chain
f) Process cycle time
g) Supply Chain Relationships: Supplier-Buyer relationship
h) Functional Strategies that impact SCM performance
i) Parameters for SCM Design
j) Information Functionality of Supply Chain
k) Principles of Supply chain Information
l) Information System activity
m) Technology Used in SCM

2) Logistic Management **(06)**

a) Definition, Objective Functions & Scope
b) Customer value chain
c) Logistical competence, competitiveness and competitive advances
d) Logistic for business excellence
e) Logistic solution
f) Role of Logistic in Supply Chain

3) Customer Service And Demand Management **(06)**

a) Relationship between customer and demand management
b) Customer service for competitiveness
c) Customer service phase
d) Service attributes
e) Customer service strategy
f) Value added logistical service

4) Logistic Planning And Strategy **(06)**

a) Hierarchy of planning
b) Relationship between logistic strategy and corporate strategy
c) The strategic logistic plan and audit
d) Logistic mission and objectives
e) Logistic Strategies & Formulation
f) Designing Logistical system

5) Logistic Mix **(16)**

a) Warehousing
   i) Concept & Functions
   ii) Warehouse Options
   iii) Warehouse Site Selection & Layout Design
   iv) Warehouse Costing
   v) Warehousing Strategies
   vi) Warehousing in India

b) Material Handling Systems
   i) Role of Material Handling
   ii) Material Handling Guidelines

c) Material Storage Systems
   i) Concept
   ii) Storage Principles
   iii) Benefits of Storage Design
   iv) Storage Methods

d) Transportation
   i) Transportation Infrastructure
   ii) Freight Management
   iii) Factors influencing Freight cost
   iv) Transportation Network
   v) Route Planning
   vi) Containerisation

e) Logistical Packaging
   i) Consumer Vs Logistic Packaging
   ii) Packaging as Unitisation
   iii) Design Considerations
   iv) Packaging Materials
   v) Returnable Logistic Packaging
   vi) Packaging Cost

f) Logistic Information system (LIS)
   i) Logistic Information Needs
   ii) Designing Logistic Information system
   iii) Desired Characteristic of LIS

REFERENCE BOOKS:

1. Logistical Management by Donald Bowersox , David Closs – Tata McGraw Hill
2. Logistic Management by V.V.Sople- Pearson
3. Supply Chain Logistics Management - Donald Bowersox , David Closs, M. Bixby Cooper – Tata McGraw Hill
4. Logistic & Supply chain management by K.Shridhara Bhat – Himalaya
5. Exploring the supply chain by Upendra kachru – Excel books
6. Supply chain management by Janat Shah - Pearson
7. Supply chain management Concept and cases by Rahul V. Altekar - PHI
8. Operations Management along the Supply chain by Russell & Taylor - WILEY-INDIA

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

307 E – International Marketing Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

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1) Introduction to International Marketing (12)

a) International Market: Meaning, Expansion, Growing Attractiveness

b) International Marketing: Meaning, Need, significance, Participants, Motives, Problems, Complexities, Decisions & Future

c) International Orientation & Stages

d) Scope of Marketing Indian Products Abroad

e) International market orientation- EPRG framework; International market entry strategies.

f) International Marketing Environment:

i) Internal**,** External, Domestic, Economic, Social, Cultural, Demographic, Technological, Political and Legal

ii) International Trading Environment

iii) Trading Blocs & Growing Intra-Regional Trade

g) International Market Entry Strategies & Mode, Entry Strategies of Indian Firms

2) International Marketing Mix (30)

a) International Product Strategy:

i) Levels & Hierarchy of product, Product-line analysis, Product design Strategy

ii) Product Life Cycle Management,

iii) New Product Development, Product Positioning & Product Adoption, Repositioning Strategies

iv) Product planning Matrix, Dimensions of Product Strategies

v) Product planning for global markets;

vi) Standardization v/s Product adaptation;

vii) Management of international brands: Brand Drivers

viii) Packaging and labeling

b) International Pricing

i) Role of Pricing, Objectives, Factors affecting Pricing, Pricing decisions

ii) Pricing Methods, Pricing Strategies, Cost based pricing, Transfer pricing, Dumping, Export price structure, Skimming Pricing, Penetration Pricing, Price discounts, Discriminating Pricing

iii) Price-Market relationship, Price Escalation: cost of exporting, Taxes, tariffs & Administrative costs, Exchange rate

iv) Price control: Approaches to lessening price escalation, Leasing in international markets

c) International Promotions

i) Promotion Decisions: Complexities and issues; International advertising

ii) Marketing Environment & Promotional Strategies

iii) Role of Export Promotion Organizations, Trade fairs and Exhibitions

iv) International Marketing Communication: Major Decisions, Communication Mix, Problems in International Marketing Communication

v) International Personal selling, Sales promotion and public relations.

d) International Distribution
   i) Distribution Channels: Policy, issues, Functions & types of channels;
   ii) International Channel conflict & Channel Decision
   iii) Functional Excellence in Distribution Planning
   iv) International logistics decisions & Management, Developing logistic Strategy

3) Export Management **(08)**

a) Managing Export Decisions
b) Export Contract: cost descriptions, risk coverage
c) Export procedure & Documentation, Modes of payment
d) Exit policy

REFERENCE BOOKS:

1. International Marketing:Text & Cases – Francis Cherunilam – Himalaya
2. International Marketing – R Shrinivasan – Prantice Hall
3. International Marketing – Rajgopal – Vikas Publications
4. International Marketing – Rajendra Nargundkar – Excel Books
5. International Marketing – Cateora,Graham – Tata McGraw Hill
6. International Marketing - Jain S.C. - CBS Publications, New Delhi

Specialisation – F: Agri- Business Management

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(NACC Accredited 'B' Grade University)

FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

304 F – Agri Business Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Introduction to ABM **(06)**

a) Meaning, definition, history, Importance and scope of agri-business
b) Changing dimension of agricultural business
c) Agri-business Management-distinctive features, nature and components
d) Five Years Plans and agri-business, characteristics of plan

2) Farm Management **(14)**

a) Organization and operation of farm business
b) Tools of farm business organization and operation
c) Steps in farm business organization
d) Evaluation of available resources in Forming & its optimum Utilization
e) Appraisal and goals of farm business
f) Approach to reorganization of the farm business
g) Farm adjustment program under uncertainty
h) Job of proficient farm planner, farm accountancy
i) Constraints in agri-business management infrastructure, technological, social & cultural. Analysis of farm records, Farm inventories

3) Agro-Processing Management **(16)**

a) Role of agro-processing industries in the Indian economy
b) Status and potential of Indian agro-processing industries.-- Food grains, commercial crops
c) Policy environment of agro-processing industries-Development, management structure and communication.
d) Work performance efficiency, public contact and public participation in agro-processing industries
e) Decision making process and entrepreneurial efficiency
f) Government policies relating to agro processing unit
g) Interdependence of agro-processing industries
h) Problem of agro-processing units
i) Guideline for financing of agro-processing industries in India

4) HRM In Agri Business Management **(06)**

a) Development of Human Resource in Agricultural Training
b) Importance of Human Resource in Agricultural
c) H. R. M. development program for Agribusiness

5) Emerging Trends In ABM **(08)**

a) Agro Tourism
b) Organic Farming
c) Contract Farming
d) Herbal Farming

REFERENCE BOOKS:

1. Dhondyal, S.P. Farm Management: An Economics Analysis. Friends Publications, 90, Krishnapur, Meerut - 250002
2. Johl, S.S. and T.R. Kapur. Fundamentals of Farm Business Management. Kalyani Publishers, 11 Rajendra Nagar, Ludhiana – 114008,P-475
3. Kahlon, A.S. and Karan Singh. Economics and Farm Management in India: Theory and Practice. Allied Publishers Pvt. Ltd. 15 JN Heredia Marg, Ballard Estate Mumbai-400038
4. Singh I.J. Elements of Farm Management Economics. Affiliated East West Press, Pvt. Ltd. New Delhi.
5. Srivastava, U.K. Vathsala. Agro-processing Strategy for Acceleration and Exports Oxford University Press YMCA, Library Building, Jai Singh Road, New Delhi – 110001.
6. Rajagopal. Organizing Rural Business Policy Planning and Management. Sage Publication, New Delhi.
7. Pandey, Mukesh and Deepak Tiwari. Rural and Agricultural Marketing International Book Distribution Co. New Delhi.
8. Diwase, Smita. Agri-Business Management. Everest Publishing House, Everest Lane, 536, Shaniwar Peth, Appa Balwant Chowk, Pune – 4110030
9. Siva Rama, K., K. Ramesh and M. Gangadhar. Human Resource Management in AGRICULTURE. Disscovery Publication, New Delhi.
10. Talwar, Prakash, Travel and Tourism Management, Gyan Books Pvt. Ltd., Main Ansari Road, Darya Ganj, New Delhi- 110 002
11. Bagri, S.C. Trends in Tourism Promotion 2003. International Books Distributors, 9/3, Rajpur Road, Dehradun-248 001 Uttarakhand (India)

1) Animal Production Management (10)

a. Scope of livestock in Indian economy
b. Livestock census and trend of livestock production
c. Terminology used in livestock care, poultry care and management of livestock and poultry i.e. calf, heifer, milking animal, dry animal, pregnant animal, draft animal and breeding bull
d. Stress management. Housing of different livestock and poultry
e. Routine farm management. Preparation of animal for different purposes
f. Various breeds of cattle, sheep, goat, buffalo and poultry
g. Nutrient requirement of livestock and poultry
h. Maintenance of records on livestock dairy and poultry farms
i. Animal health cover, structure of udder and letting down of milk, clean and hygienic milk production
j. Reproductive systems of male and female, estrus cycle, pregnancy and parturition. Systems of breeding, artificial insemination

2) Value Addition in Animal Products (10)

a. Present status of dairy, poultry, meat, wool and hide industries in WTO regime. Milk composition of different species
b. Production, packing , marketing of milk, meat and their products
c. Import, export of animal and poultry products
d. Price regulation in animal products. Factors influencing price
e. Trends in marketing and utilization of animal products
f. Importance of hides and bones, quality standards and storage
g. Market standards and regulation of animal products

3) Post – Harvest Technology of Horticultural Crops (14)

a. Importance and present status of post harvest technology in horticultural crops in India and Maharashtra. Maturity, harvesting and handling in relation to extended shelf-life and storage quality of fruits, vegetables and flowers
b. Maturity and harvesting indices of fruits, vegetables and flowers
c. Factors responsible for maturity, ripening and deterioration of horticultural produce
d. Methods of pre-cooling, grading, packaging, storage and transport of fruits, vegetables and flowers
e. Importance and scope of fruits and vegetable preservation
f. Selection of site for fruit and vegetable preservation unit. Principles and methods of preservation
g. Preparation of jams, jellies, marmalades, squashes, juices, syrups, preserves, crystallized fruits, chutney, pickle and ketchups
h. Spoilage of processed products. Post harvest management of cut flowers. Control of post harvest diseases of important fruits and vegetables

4) **Bio-fertilizers and Mushroom Production (06)**

a. Bio-fertilizers: Introduction, importance and definition
b. Type of bio-fertilizers, Economics of bio-fertilizer production
c. Mushroom: Introduction, importance and types of mushrooms. Requirements for mushrooms cultivation: different tools, equipments, substrates and chemicals required for commercial cultivation of mushroom

5) Information Technology in Agri-Business (10)

a. Information Technology: meaning, role and importance in Agri business and Agriculture marketing
b. Importance of Common Service Centers (CSC), Common issues of CSCs, Expert decision support system in Agriculture
c. Information Technology for Agriculture Marketing
d. Online market information, online market status in India
e. Website on Agriculture marketing and export
f. Role of private companies in online marketing – eChaupal, HLL Shakti

REFERENCE BOOKS:

1. Banerjee, G.C. Text Book of Animal Husbandry. Oxford and IBM Publishers, New Delhi.
2. Sashry, N.S.R.C.K. Thomas and R.A. Singh. Farm Animal Management and Poultry Production. NSR, Vikas Publishing House Pvt. Ltd. Delhi.
3. Hand Book of Animal Husbandry, ICAR, New Delhi.
4. Panda, B. and etal. Feeding Poultry. ICAR, Publication, New Delhi
5. Singh, R.A. Poultry Production. Publishers, New Delhi.
6. Maske, O Norton. Commercial Chicken Production. Manuel AVI Publishers, INC West Port.
7. Ling. E.R. Text Book and Dairy Chemistry. Chapman Hall Ltd., London
8. Devendra, C and G. B.McElroy. Goat and Sheep Production in Tropics-Long man Group Ltd., London.
9. Pantastico, E.R.,B. Post Harvest Technology, Handling, Utilization of Tropical and Sub-tropical Fruits and Vegetables. The AVI Publishing Co., West-Post, Connecticut, USA.
10. Salunke, D.K. and Desai, B.B.Past Harvest Biotechnology of Vegetables. II CRC Press, Boca Raton, Florida.
11. Varma, L.R. and V.K.Joshi. Post Harvest Technology of Fruits and Vegetables, Vol. II. Indus Publishing Company, New Delhi-110027
12. Dixon, R.O.D. and C.T. Wheeler, Nitrogen Fixation in plants. Blackie USA, Chapman and Hall, New York.
13. Motsara I.M.R., P. Bhattacharyya and Beena Srivastava, Biofertilizer Technology, Marketing and Usage- A source Book – cum glossary, FDCO, New Delhi.
14. Bahl, N. Handbook on Mushrooms. Oxford and IBH Pub. Co.Pvt, Ltd, New Delhi.
15. Kapoor, J.N. Mushroom Cultivation. Sterling Pub. Co., New Delhi-16.
16. Paul McConnell. Measuring the impact of information on development. IDRC, 1995
17. Recciuti, M.Database vendors hawk wares on Internet. Info World, 17-2, Jan 9,10.
18. Melone, T, Yates, J and Benjamin, R. Electronic Markets and Hiersrchies. CACM 485.
19. Shah Jignesh. Commodity Future- Benefits start flowing in The Hindu Survey of Indian Industry.

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

306 F – Agricultural Economics

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Introduction to Agricultural Economics (08)

a. Meaning, concepts, definitions scope and importance of Agricultural in National Economy
b. Land: Concept Land use classification, Land ownership and distribution of land, Management of Land
c. Agricultural labor and capital
d. Farm Mechanization and its scope and effects on Agriculture

2) Structure & Dynamics of Indian Agricultural (08)

a. Place of agricultural in National economy
b. Special characteristics of agriculture in Indian economy
c. Pattern of agricultural holdings
d. Agricultural productivity: Trends, causes and consequences of low productivity in India
e. Green revolution: New strategy in development of Indian agriculture

3) Indian Agricultural Policies (16)

a. Meaning, types and importance
b. Evolution of agricultural policy
c. Famine Commission Report
d. Royal Commission on Agriculture: Recommendations
e. Drought Prone Area Programme (DPAP)
f. Land Reform Policy
g. National Insurance Policy
h. Nature and objectives of land reforms
i. Tenancy reforms, Crash Scheme for Rural Development
j. Major agricultural input policies including seed, fertilizer, pesticides, credit and irrigation
k. National Rural Employment Assurance Programme & other recent Agricultural Development Programs
l. New Agricultural Export Polices for different commodities

4) Financial Management in Agri-Business (18)

a. Nature and scope, importance of agricultural finance
b. Agricultural finance as a part of public finance
c. Source of capitals: Meaning and concept of agriculture credit
d. Classification and forms of credit, 3 R's, 5C's and 5 P's of credit
e. Credit creation and credit control
f. Credit rationing and planning
g. Legal aspects of credit
h. Supervised credit, Credit demand and supply
i. Credit institution, credit policy and needed changes
j. Portfolio management
k. Financial ratio analysis , Break-even analysis and Investment analysis
l. Capital Market

306 F – Agricultural Economics

REFERENCE BOOKS:

1. Agrawal, A.N. - Indian Agriculture: Problems, Progress and Prospects. Vikas Publishing House Pvt. Ltd., Delhi.
2. Mamoria, C.B. - Agricultural Problems of India.- Kitab Mahal, Allahabad
3. Owen Oliver, - Natural Resources Conservation and Ecological Approach.- MacMillan Co.866, Third Avenue, New York-10022.
4. Mamoria, C.B. - Agricultural Problems of India.- Kitab Mahal, Allahabad.
5. Bansil, P.C. - Agricultural Problems of India- Vikas Publishing House Pvt. Ltd., Delhi.
6. Jain, S.C. - Agricultural Policy in India.- Allied Publishers Pvt.Ltd. Mumbai, Kolkatta, New Delhi.
7. James P.G.- Agricultural Policy in wealthy Countries.- Ague and Robertson Publishers, Sydeny.
8. Karla, O.P.- Agricultural Policy in India.- Bombay Popular Prakashan, Mumbai.
9. Datta, K.K. and K.P.M. Sundaram. - Indian Economy.- Latest Edition, S. Chand and Co., Ltd., 7361, Ram Nagar, Qutab Road, New Delhi-110055.
10. Banerjee, G.C.- Text Book of Animal Husbandry.- Oxford and IBH Publishers, New Delhi.
11. Mahanta, K.C. - Animal Husbandry in India.
12. Patnkar, S.V.- Financial Management.- Everest Publishing House Everest, Parshuram Apartment, 12, Sankalp Society, Paud Phata Road, Opp. Jog Hospital, Pune-411038
13. Jain, S.C. - Management in Agricultural Finance.- Vora and Company. Publishers Pvt. Ltd.
14. Prasanna Chandra. - Financial Management. - Tata Mcgraw Hill Publishing Co. Ltd., New Delhi.
15. Kahlon, A.S and Karam Singh. - Managing Agricultural Finance: Theory and Practice. - Allied Publisher Pvt. Lt.,165 , J.N. Heredia Marg, Ballard Estate, Mumbai-400 038.

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

307 F – Agricultural Marketing

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Introduction to Agricultural Marketing (06)

a. Scope, concepts & objectives
b. Differences in Agricultural & consumer Marketing
c. Constraints in Agricultural marketing
d. Problems of Agri. Marketing : Traditional agro. Marketing and present status, suggestion for improvements
e. Present status & problem in various marketing function
f. Standardization and Grading

2) Problems of Agricultural Marketing (12)

a. Defects in traditional agri. marketing system and suggestions for improvement
b. Standardization: Standards and standardization, aims of standardization, significance of standardization, demerits of standardization. Basis of standards
c. Grading: A marketing function, Importance of grading in agriculture grading in India
d. Channels of Marketing: Meaning, definition, marketing costs, margin, price spread, factors affecting the cost of marketing, reasons for higher marketing costs of farm commodities, ways of reducing marketing cost
e. Study of Market Intelligence and Market Integration : Meaning, definition, types of market integration, market function, AGMARK, price trends, market information. Co-operative agricultural marketing and public agencies involved in agricultural marketing viz. FCI, NAFED, STC, etc. Functions of price mechanism, interrelationship between prices of inputs and output. Nature and supply of agricultural products, marketable and marketed surplus. Types and reasons for price movements and their effect on agricultural price stabilization and price support polices.
f. Warehousing: State and Central Warehousing Corporations, objectives, functions, advantages, speculation, future trading and hedging
g. Hedging: Meaning, chief features of hedging, kinds, purpose, benefits and limitations of Hedging
h. Future Trading: Characteristics of future trading, organized trade in futures

3) Retail Marketing (12)

a. Concept, types of retailers, supermarkets, factory outlets, hypermarkets
b. Non store retailing. Retailer- marketing decisions. Direct selling, one to one selling, multiple selling, direct marketing and multiple marketing
c. Major types of retail organization, co-operative chain stores, voluntary chain, retailers and consumer cooperatives
d. Retail Chain Management by Corporate Houses
e. Procurement decision, Price, promotion and place decision
f. Packaging and Market Segmentation in Retail Marketing
g. Store Management: Retail location, merchandising, using price to stimulate market sale
h. Branding Strategy**:** Manufacturer's brand, private label, brand for a sale
i. Trends in retailing. Retailing strategies
j. Impact of retailing on economy and society

4) Supply Chain Management / Sales & Distribution (05)

a. Understanding Supply Chain
b. Decision phases in Supply Chain
c. Drivers of Supply Chain performance
d. The Role of Transportation in a Supply Chain, Factors affecting transportation Decisions, Tailored Transportation
e. Managing Supply, Managing Demand in Supply Chain

5) Promotion of Agri Products (05)

a. Basic Concept of Promotion
b. Fundamental of Advertising
c. Market Analysis for Agri Products segmentation & Targeting
d. Direct Marketing
e. Sales Management, Personal Selling & Salesmanship
f. Sales Related Marketing Policies

6) Trading of Agricultural Marketing (10)

a. Importance of agricultural commodities in agricultural marketing
b. Marketing of cereals rice, wheat and jowar
c. Marketing of pulses-mango, tur, gram, udid etc
d. Average cost of processing wheat into wheat flour, paddy to rice, whole pulses in to split pulses, comparison of different rice milling methods
e. Study on price spread of important crops and producer's share in consumer rupee
f. Marketing of mango, citrus and grapes
g. Marketing of vegetables
h. Improving efficiency in commodity marketing
i. Role of co-operative and regulated market in commodity marketing
j. Marketing of commercial crops with special reference to all functions and price analysis
k. Commercial commodity Trading- cotton, sugarcane, onion, grapes, banana, citrus, mango, cut flowers – roses, gerbera, gladiolus, etc. vegetables – cauliflower, cabbage, tomato, potato, onion, ladies, finger, brinjal
l. Existing levels of processing and future potential. Export and export potential

REFERENCE BOOKS:

1. Acharya, S.S. and N.L. Agrawal. -Agricultural Marketing in India.- Oxford and IBM Publishing Company Pvt. Ltd., 66 Janpath, New Delhi-110001.
2. Gupta, A.P. - Marketing of Agricultural Produce in India. - Vora and Company Publishers Pvt, Ltd., 3, Round Building, Kalbadevi, Mumbai-400002
3. Mamoria C.B. and R.L. Joshi.- Principles and Practice of Marketing in India. -Kitab Mahal, 15, Thorn hill Road, Allahabad.
4. Philip Kotler.- Marketing Management.- Pearson Education Publishers, New Delhi.
5. Panvar, J.S.Beyond - Consumer Marketing. - Response Books, Sage Publications, New Delhi.
6. Pandey, Mukesh and Deepak Tiwari.- Rural and Agricultural Marketing.- International Book Distribution Co., New Delhi.
7. Swapna Pradhan.- Retail Management – Tata McGraw Hill
8. Acharya, S.S. and N.L. Agrawal. - Agricultural Marketing in India. - Oxford and IBH Publishing Company Pvt., Ltd., 66, Janpath, New Delhi 110001
9. Mamoria, C.B. and R.L. Joshi. - Principles and practice of Marketing in India. - Kitab Mahal,15, Thorn hill Road, Allahbad.
10. Sunil Chopra, Peter Meindl,- Supply Chain Management.- Prentice Hall Publication
11. Panvar, J.S. Beyond - Consumer Marketing. - Response Books Sage Publications, New Delhi.
12. S. A. Chunawala,-Advertising, Sales and Promotion Management- Himalaya Publishing House

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

aper: 304G: EMERGING TRENDS IN INFORMATION TECHNOLOGY

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. **Overview of an E – Commerce**
   Internet, Intranet, Extranet, Definition, Goals of E- Commerce
   Difference between E-Commerce and E- Business
   Models of E- Commerce
   Limitations and Advantages of E-Commerce (**4**)
2. **E-Banking**:
   Transactions: Inter Banking, Intra Banking, Electronic Payments, (Payment – Gateway Example)
   Securities in E-banking (SSL, Digital Signatures – Examples)
   Services Provided: ATM, Smart Card
   ECS (Electronic Clearing System) e.g. Telephone, Electricity Bills (**8**)
3. **E- Security**
   Firewalls, Electronic Market / e- shop
   Introduction to security, Types of Securities
   Security Tools, Network Security (**8**)
4. **CRM:**
   Sales, Marketing and Service Management, What is BPO/BCP, Why it is required, Guidelines, Merits/De-Merits, Call Center – brief perspective technology wise, Functioning, Ethics, Disaster Recovery Management, Case Study (**8**)
5. **Content Management and Disseminations:**
   E-learning – Models WBT, CBT, Virtual Campus, LMS & LCMS, Video Conferencing, Chatting Bulleting, Building Online Community, Asynchronous/ Synchronous Learning, Case Study **(8)**
6. **E – Logistics**:
   Logistics & Supplier Chain Management, Warehousing Management, Transportation/Distribution Management (**4**)
7. **E – Governance**:
   E –Governance Models: (G2B, G2C, C2G, G2G), Challenges to E – Governance, Strategies and tactics for implementation of E – Governance
   Case Study **(6)**
8. **Knowledge management**:
   What is KM? (Components and Type of Knowledge), Knowledge Building Models, KM Cycle & KM architecture, KM tools, KM approaches **(2)**
9. **GIS/GPS**:
   What is GIS?, Nature of Geographic data, Spatial Objects & Data Models, Getting map on Computers, GIS standards & Standardization Process of GIS development, Implementation and Deployment phases **(2)**

REFERENCE BOOKS:

1. Management Information System: Jawadekar- TMH
2. Management Information System: Laudon & Laudon
3. The Essential Guide to Knowledge management: Amrit Tiwana
4. The GIS Book: George B. Karte.
5. Internet (Use of Search Engines Google & yahoo etc)
6. E – Commerce: Milind Oka
7. E – Commerce: Bhaskar
8. Fire Wall and Internet Security: William Cheswick, Stevens, Aviel Rubin
9. E-Governance Case Studies – Ashok Agarwal

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

Paper: 305G: RELATIONAL DATABASE MANAGEMENT SYSTEMS

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. Introduction

1.1 History: Advantages and limitations of RDBMS; Users of RDBMS

1.2 Software Modules in RDBMS; Architecture of RDBMS. **(4)**

2. Modeling Techniques

2.1 Different Types of Models, Introduction to ERD. **(6)**

3. Hierarchical Database (2)

4. Network Database (2)

5. Relational Database

Introduction; Codd's Rules; Concept of Domain, Tuple, Cardinality; Comparison between HDB-NDB-RDB **(6)**

6. Normalization

Advantages and disadvantages of Normalization; 1NF-2NF-3NFrules with examples; Anomalies. **(10)**

7. SQL commands.

Basic Structure, Set Operations, Aggregate Functions, Null Values, Nested Sub queries, Views, Complex Queries, Modification of the Database, Joined Relations, Data-Definition Language, Embedded SQL, Dynamic SQL, Exercises. **(10)**

8. Introduction to object oriented database

Concept, Object binding in Oracle - Class, Attribute, Methods, Object type, Definition, Declaring and initializing, Methods, Alter and Drop type. **(10)**

REFERENCE BOOKS:

1. DATABASE System Concepts, Silberschatz , Korth, Sudarshan

2. SQL by Scott Urman

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

Paper: 306G: VISUAL BASIC AND ORACLE

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. Introduction to Visual Basic

Event-driven Programming, Starting and Exiting VB, Understand VB Environment, Project Explorer, Properties Window, Toolbox, Form Layout Window, Property Pages, Getting Help, Saving Project, Printing Project, Running Applications. **(3)**

2. Adding Code and Events

Code Window, Naming Conventions, Variables (all data types) - Byte, Boolean, Integer, Long (long integer), Single (single-precision floating point), Double (double precision floating point), Currency (scaled integer), Decimal, Date, Object, String (variable length), String (fixed-length), Variant (with numbers), Variant (with characters), User defined (using type), Scope (Global, Local, Static), Constants. **(3)**

3. Visual Basic Controls

Label and Textbox Controls, Command Button Controls, Frame, Checkbox and Option Button Controls, List Box and Combo Box Controls, Drive List Box, Directory List Box and File List Box Controls, Formatting Controls, Control Arrays, Tab Order. **(5)**

4. Working with functions

String Functions, Mathematical Functions, Date Functions, Data type Conversion Functions. **(3)**

5. Control Statement

IF and IIF Statement, Select Case Statement, Do Statement, For Statement Exit Statement. **(2)**

6. Dialog Boxes

Msgbox, Inputbox, Common Dialog Box (Microsoft Common Dialog Control 6.0) **(2)**

7. Menus

Creating Menus, Adding Code to Menus, Toolbars, Other Common Controls (Microsoft Windows Common Controls 6.0, Microsoft Windows Common Controls-3 6.0) **(3)**

8. Accessing data

Reading and Writing Files, Data Form Wizard, Data Control, Data Grid Control, DBCombo Box and DB-List Box, SQL Queries in VB, Jet DAO,ADO (with controls and code), Error Handling. **(5)**

9. Objects and Classes (Only Basic Definition)

OLE Control, Programming with objects (Creating objects of a user defined class and using them on the form). **(2)**

10. Windows API

Defining Windows API, DLLs, Declare Statement, Calling API routine **(1)**

11. Crystal Reports (8.5) – Overview **(1)**

ORACLE

1. Introduction to Oracle Architecture **(1)**

2. Queries

a. Select with all options, Operators, Arithmetic, Comparison,
b. Logical (in, between, like, all, %, _, any, exists, is null, and ,or, not, Distinct)
c. Order by clause **(2)**

3. SQL Functions

a. Date

Sys_date , next_day, Add_months, last_day, months_between,

b. Numeric

Round, trunc, abs, ceil, cos, exp, floor

c. Character
Initcap, lower, upper, ltrim, rtrim, translate, length, lpad, rpad, replace
d. Conversion
to_char, to_date, to_number
e. Miscellaneous
Uid, User, nvl, vsize, decode, rownum
f. Group function
avg, max, min, sum, count, with Group by and Having Clause
g. N**ested functions** **(7)**

4. Joins
Simple join
Equi join
Non equi join
Self join
Outer join
Set operators (Union, union all, intersect, minus)
Sub queries and Correlated query
DML statements (Insert, Update, Delete with where clause)
TCL (Commit, Rollback, Savepoint)
Locks in Oracle
DDL Statements **(4)**

5. Data types
Character
Char, Varchar/varchar2, Long
Number
Number (p) - fixed point, Number (p s) - floating point
Date
Raw
Long raw
Introduction to LOB datatypes (CLOB, BLOB, BFILE) **(4)**

6. Table
Create, Alter, Drop, Truncate, Rename
Constraints (Primary key, Foreign Key, Unique Key, Check, Default, Not Null, On delete, Cascade)
Column level and Table level constraints
Oracle Objects
Views, Sequences, Synonyms, Index (Define, Alter and Drop) **(4)**

7. Database Triggers
Types of Triggers
Enabling, disabling
Predicates- inserting, updating, deleting **(4)**

8. Procedures and Functions
Definition, Implementation and Execution **(4)**

REFERENCE BOOKS:

1. Visual Basic 6.0 Programming - Holzner Steven
2. Visual Basic 6.0 in 21 days - Perpy Greg
3. Peter Norton's Guide to Visual Basic 6.0 - Peter Norton
4. Visual Basic 6.0 - Peter Wright
5. Visual Basic 6.0 – Corhell
6. Oracle8- William G Page Jr. and Nathan Hughes

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

Paper: 307G: SOFTWARE ENGINEERING

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. System Concept
Definitions, Integrated Systems, Sub-systems, Modules **(4)**

2. Role of Software Engineer / Analysts / Users in the various phases of Systems Development Life Cycle **(2)**

3. General phases of Systems Development Life Cycle
Feasibility Study, Requirements Capture, Detailed Systems Analysis, Systems Design, Testing, On-site Implementation and Maintenance **(12)**

4. Fact Finding Methods (2)

5. Different Approaches to Software Development
Waterfall Model, Spiral Model, Prototyping, RAD, Object Oriented, 4GL **(10)**

6. Structured Analysis and Design Method and Software Engineering Techniques (10)
Tools and Methodologies in Systems Development
Application Systems Modeling;
Process Modeling - Data Flow Diagrams; Concept of Object Oriented Modeling
Temporal Modeling - State Transition Diagrams; Database Design Methods
Data Modeling - Entity Relationship Method; Mapping E-R Model to arrive at the Database Design; Normalization Technique for Database Design; Controlled De-normalization
System Documentation Techniques- System Flow Charts; Functional Decomposition Diagrams; Structure Charts; Structured Flow Charts (N-S Diagrams)
Logic Representation **Techniques**
Decision Trees; Decision Tables; Pseudo code and Structured English

7. Users Interface Design
Menu, Screen and Report Layout Designing
The Mode/Style of interaction between the system and the user **(4)**

8. Codes Designing for field values - Designing Code-less system (2)

9. Introduction to Computer Aided Software Engineering (CASE) (2)

10. Types of Data Processing - Batch, On-line and Real Time Processing (2)

REFERENCE BOOKS:

1. Analysis and Design of Information System 2nd Ed. - Senn
2. Software Engineering Practitioner's Approach - Roger Pressman
3. Introduction to Systems Analysis and Design - Hawryszkiwycz
4. Systems Analysis and Design - Elias Awad
5. Introducing Systems Analysis and Design - Lee
6. Systems Analysis and Design - Perry Edwards
7. Software Engineering Concepts – Fairley

2011

North Maharashtra University, Jalgaon

FACULTY OF COMMERCE & MANAGEMENT

Syllabus of Master in Business Administration (MBA)

SEMESTER: IV

W.E.From 2011

North Maharashtra University, Jalgaon

(NACC Accredited 'B' Grade University)

FACULTY OF COMMERCE & MANAGEMENT

STRUCTUREOFMASTER IN BUSINESS ADMINISTRATION (M.B.A.)

Semester-I and II			
Paper	**Semester-I** **A : Credit Courses**	**Paper**	**Semester-II** **A : Credit Courses**
101	Management Science	201	Management Practices
102	Accountancy For Managers	202	Business Research Methods
103	Managerial Economics	203	Global Economic Scenario
104	Information Technology For Managers	204	Management Information System and ERP
105	Introduction To Operations Management	205	Financial Management
106	Organizational Behavior	206	Human Resource Management
107	Corporate Social Responsibility	207	Marketing Management
108	Corporate Communication Skills	208	Quantitative Techniques

Semester-III and IV			
Paper	**Semester-III** **Credit Courses**	**Paper**	**Semester-IV** **Credit Courses**
301	Strategic Management	401	e-Commerce & Excellence Management
302	Entrepreneurship & Project Management	402	Family Business Management
303	Legal Aspects Of Business	403	Indian Commercial Laws
304	Specialization-I (Major)*	404	Specialization-V (Major)*
305	Specialization-II (Major)*	405	Specialization-VI (Major)*
306	Specialization-III (Major)*	406	Specialization-VII (Major)*
307	Specialization-IV (Major)*	407	Project Report & Viva-Voce*
308	Specialization (Minor-I)**	408	Specialization (Minor-II)**

*Specialization In Major Subjects (Any One)		**Specialization In Minor Subjects (Any One)	
A	Financial Management	A	Financial Management
B	Marketing Management	B	Marketing Management
C	Human Resource Management	C	Human Resource Management
D	Operations Management	D	Operations Management
E	International Business Management	E	International Business Management
F	Agro Business Management	F	Agro Business Management
G	Systems	G	Systems

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(NACC Accredited 'B' Grade University)

FACULTY OF COMMERCE & MANAGEMENT

M.B.A.

SEMESTER: IV

401 – E-commerce and Excellence Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. Introduction to E-Commerce **(08)**

a. Traditional vs. e-commerce transactions
b. E-Commerce: Concepts, Definitions, Benefits &Impact
c. Classification of e-commerce: B2B, B2C, C2C, B2G,B2E
d. Applications of ecommerce
   i. Electronic Catalogs&Auctions
   ii. Electronic Banking
   iii. Electronic Searching
   iv. Education & Learning
   v. Electronic Marketing
   vi. Electronic Supply Chain Management
   vii. e-Customer relationship management
   e. financial services
   i. Electronic Trading
   ii. Call Center & BPO's etc.
f. Internet and E-commerce
g. Hardware and software requirements

2. E-commerce Models **(06)**

a. Native Content Based Models
b. Native Transaction Models
c. Transplanted Content based Models
d. Transplanted Transaction based Models

3. Framework of e-commerce architecture

a. Network Infrastructure (04)
   i. LAN, MAN, WAN
   ii. VPN
   iii. TCP/IP Reference Model
   iv. Domain Name Systems

b. Information & Distribution Technology (04)
   i. FTP Applications
   ii. Electronic Mail
   iii. WWW Server
   iv. HTTP

c. Networked Multimedia content Publishing Technology (03)
   i. Information Publishing
   ii. Web Browsers
   iii. Multimedia Content

d. Security & Encryption (08)
   i. Computer Crime
   ii. Importance of Security
   iii. Sources of Technical Vulnerabilities
   iv. Security Policy, Procedure & Practices
   v. Site Security, Service Security, Transaction Security
   vi. Firewalls
   vii. Transaction Security
   viii. Cryptography (Digital Signature): Public Key & Private Key
   ix. Electronic Mail Security
   x. Security Protocol for Web Commerce
e. Payment Services (04)
   i. Concept of Payment System
   ii. Third Party in e-commerce payment
   iii. Online Payment System: Pre-paid & Post-Paid Systems
f. Business Services Infracture (01)
g. Public Policy & Legal Infrastructure (01)
h. Electronic Data Interchange (EDI) (03)
   i. EDI:Development, Standards, Components & Role
   ii. Web enabled EDI.

4. Business Excellence (08)

a. ConceptExcellence
b. Core Themes of Excellence
c. Measuring Business Excellence
d. Quality awards & Excellence
e. Overview & Development of Self Assessment Process
f. Achieving organizational Excellence
g. Excellence Maturity Model

REFERENCE BOOKS:

1. E-commerce: Framework, Technologies & Applications– Bharat Bhaskar – Tata McGraw Hill 3rd Edn
2. Electronic Commerce: a Managers Guide – Ravi Kalakota - pearson
3. E-commerce - C.S.V. Murthy – Himalaya Publications
4. E-Commerce -Greenstein and Feinman – Tata McGraw Hill
5. Electronic Commerce–Awad - Pearson
6. E-Commerce: The Cutting Edge of Business -Bajaj & Nag - TMH
7. E-Commerce-Mishra- Macmillan
8. Assessing Business Excellence – L.J.Porter& S.J Tanner – ElsevierButterworth Heinemann
9. Measuring Business Excellence - by Gopal K. Kanji – Routledge

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: IV

402 – Family Business Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) The purview of family business **(10)**

a) Family as a business system-
   i) Driving the Values, Vision and Mission of the Family
   ii) Problems with Valuation in Ownership Succession
   iii) The Needs of the Older Generation

b) Family Dynamics –
   i) Family – a culture, Evolution
   ii) The Role of Marriage as Bonding
   iii) The family building – Parents & Children, Brothers & Sisters,
   iv) The family vessel Concept - Parenting Styles & their wars, Scapegoating
   v) The personality differences in the family which affects the family structure – Members, Uniqueness in the family traits, and the rings of influences

c) Family Business:
   i) Working Definition
   ii) What Makes It Unique?
   iii) Comparative Advantages of Family Business
   iv) History, Importance and Types of Family business
   v) Family Business Theory
   vi) Contribution of Family Business in Economy and Society

2) The construct of Family Business- **(10)**

a) The Roles, Responsibilities and Rights of Family shareholders
b) Strategies to develop the capabilities of the stakeholders
c) Roadblocks of Family business –
   i) Inability to separate family's interest from the business,
   ii) Lack of focus on strategy,
   iii) Insensitivity towards customers,
   iv) A short term gain approach and Seasonal nature of the business,
   v) Nepotism in the family structure
d) Family business vis-à-vis Management Development Plan –
   i) Succession and Continuity planning
   ii) Training the Next Generation - Value Creation and Next Generation
   iii) Dimensions of Personality w.r.t. Family Business
   iv) Sibling Team and Cousin Consortium
   v) How to Promote Trust Among Family Members
   vi) Family reunion

3) Family Wars and Conflicts **(12)**

a) Meaning and Nature of the Family Wars and Conflicts
b) Families at War –
   i) Gender, Aging and Family Size factors
   ii) Analysis of Families, Concept of Selfish family
c) Family wars – The nature and the TWO faces of family business

d) The root causes of Conflicts –Ingredients, &personal conflicts,
e) Conflicts as Process & Relationship
f) Consequences of family wars-Rewards, Fairness and Cheating,
g) Warning signs of Family wars
h) Conflict Resolution
i) Family Risk Factors & Remedies
j) Conflict as a source of Progress

4) Family Business Governance (06)

a) Uniqueness of Family Business Governance
b) Family Members and Outsiders
c) Family business - Board of Directors in Family Business&Makeup and Recruiting the Board
d) Family Councils and Family Assembly
e) Dual System of Corporate Governance and Family Governance

5) Case studies in Family Conflicts and War from Gordon and Nicholson (12)

a) Brothers at Arms –The Reliance Story, The Dassler family
b) Fighting for Crown – Bata story, IBM
c) Schism : The House Divided – The Pathak family, The LA Times Group and the Chandlers

REFERENCE BOOKS:

1. Family Wars – Classic conflicts in family business by Grant Gordon and Nigel Nicholson : Kogan Page
2. Entrepreneurship Development small business Enterprises – PoornimaCharantimath - Pearson
3. The Family Business Management Handbookby Editor Mark Fischetti
4. Strategic Planning for the Family Business:by Randel S. Carlock, John Ward
5. Culturally-Sensitive Models of Family Business by Gupta, V., Levenburg, N., Moore, L., Motwani, J., & Schwarz, T. (Eds.). (2008). The Collection. Hyderabad, India: ICFAI Press
6. The Family Firm Institute Fellows Summer Reading List: The Inaugural Edition
7. Hoy, F., & Sharma, P. (2009). Entrepreneurial Family Firms. Upper Saddle River, NJ: Prentice Hall
8. Leach, P. (2007). Family Businesses: The Essentials. London: Profile Books
9. Handbook of Family Business and Family Business Consultation: A Global Perspective, edited by Florence Kaslow. International Business Press, Binghamton, NY, 13904, 464 pages. Paperback. ISBN 0-7890-2777-1

North Maharashtra University, Jalgaon

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FACULTY OF COMMERCE & MANAGEMENT

M.B.A.

SEMESTER: IV

403 – Indian Commercial Laws

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

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1) Consumer Protection – **"Consumer Protection Act, 1986"** **(07)**

a) Definition of – a Consumer, a Person, Goods, Service, Trader & Manufacturer

b) Meaning of - Consumer disputes, Consumer complaints, Unfair & Restrictive Trade Practices

c) Consumer Protection –

i) Meaning & Need - Reality or Taboo

ii) Consumer Education, Guidance

iii) Consumer rights

iv) Consumer Protection methodology – Education, Regulation and Legislation

v) Consumer Protection Councils

vi) CDRAs

2) Company Law – **"Companies Act, 1956"** **(08)**

a) Definition, Characteristics & Types of Companies

b) Promotion, Capital subscription & Pre-incorporation contracts

c) MoA&AoA - Meaning, Contents & Distinction

d) Doctrine of Indoor Management & Doctrine of Constructive Notice

e) Doctrine of Ultra-Virus

f) Management of Company

i) Meaning of - Director, Managing Director, Manager

ii) Distinction between Managing Director & Manager

3) Cyber Laws – **"Information Technology Act, 2000"** **(10)**

a) Rationale, Objective & Scheme of the IT Act, 2000

b) Digital Signature

i) Meaning

ii) Authentication of Electronic records – Asymmetric Crypto system, Electronic records, Key pair, Private key, Public key, Subscriber & Verification

c) Electronic Governance

i) Legal recognition of Electronic Records & Digital Signature

ii) Use of Electronic Records & Digital Signatures in Government & its agencies

iii) Retention of Electronic Records

iv) Powers to make rules by Central Government in respect of Digital Signature

v) Definitions of – Information, Electronic Form, Accessibility, Computer, Computer Network, Computer Resource, Computer system, Data & Functions.

d) Meaning of Certifying authority under the Act

4) Information Revolution – **"Right To Information Act, 2005"** **(05)**

a) Important theme w.r.t. Citizen, Information & Public authority

b) Enforcement & Penalty under the Act

c) Right of Third Party

5) Arbitration **(08)**

a) Meaning & concept
b) Arbitration & Interim measures
c) Appointments of Arbitrators
d) Arbitration Procedure
e) Impartiality of Arbitrators
f) Foreign Awards

6) Case studies in Indian Commercial Laws – Typical cases based on the above topics only. **(12)**

REFERENCE BOOKS:

1. Legal Aspects of Business by AkhileshwarPathak – McGraw Hill
2. Legal Aspects of Business by R.R.Ramtirthkar – Himalaya Publishing House
3. Mercantile Law by S.S.Gulshan – Excell Books
4. Mercantile & Commercial Laws by RohiniAggrawal – Taxman Publication
5. Elements of Merchantile Laws by N.D. Kapoor – Sultan Chand & Sons
6. Business law – Bulchandani - Himalaya

Specialization – A – Financial Management

North Maharashtra University, Jalgaon

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FACULTY OF COMMERCE & MANAGEMENT

M.B.A.

SEMESTER: IV

404 A – Investment & Portfolio Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Investment: (04)

a) Saving & Investment,Investment: Concept, characteristics,Opportunities, Investment Decision &Process
b) Factors favorable for Investment, Investment & Gambling, Investment Vs Speculation, Financial Vs Physical Investment
c) Investment Attributes.
d) Concept of Investment & Tax Planning.

2) Investment Avenues (12)

a) Non Marketable fixed Income avenues- Bank Deposit, Corporate Fixed Deposit Provident Fund including PPF, National Saving Certificate
b) Marketable Avenues: Equity Shares, Preference Shares, Fully Convertible Debentures, Non-Convertible Debentures, Bonds, RBI's Tax Free Bonds, Gilt Edged Securities, Private Equity & Venture Capital,
c) Other Avenues: Units of Mutual fund, Life Insurance, Non-Security Forms of Investment, Real Estate, Money Market Instruments.

3) Investment Management Framework: (12)

a) Review of Investment Avenues, Specification of Investment Objectives,
b) Formulation of Investment strategy, Selection of Securities or assets,
c) Factors to be considered in Evaluation of Performance, Tax Implications.
d) PrepareInvestment Plans for Individuals at:
   i) Young Unmarried stage
   ii) Young Married stage :
      (1) Where both partners work
      (2) Where one of the 2 partners work
   iii) Young Married , with children stage
   iv) Married , with older children stage
   v) Pre-retirement Stage
   vi) Retirement Stage

4) Security Analysis (12)

a) Concept of Security& Security analysis
b) Economic Analysis: Current State of economy, Inflation Adjustment, Significance & Interpretations of economic Indicators.
c) Industry Analysis: Concept & Growth Cycle of Industry, Competitive position & Investment classification of Industry, Impact of Government Policies.
d) Company Analysis: concept, market, accounting policies, profitability, dividend policy, capital structure, financial analysis, operating efficiency, managerial skills & efficiency
e) Technical Analysis:Technical Assumption, Technical Vs Fundamental analysis, Tools &Efficient Market Theory

5) Portfolio Analysis & Management (10)

a) Meaning, Elements & Measurement of Risk, Systematic Risk & Unsystematic risk,
b) Optimal Portfolio, Selecting the Best portfolio,Markowitz Model of Portfolio Selection
c) Portfolio revision: Meaning, Need, Strategies & Constraints
d) Performance Evaluation of Portfolios – (Theoryonly)
e) Portfolio Management: Meaning, Phases, Strategies, Asset Allocation, Building Investment Portfolio

REFERENCE BOOKS

1. Investment Management by V. A. Avdhani , Himalaya Publishing House
2. Fundamentals of Investment Management - Geoffrey Hirt, Stanley Block –Tata Mcgraw Hill
3. Investment Analysis &PorfolioManagement by Ranganathan - Pearson
4. Investment Management:Security analysis and portfolio Management by V. K. Bhalla - S. Chand
5. Investments – Bodie, Kane, Marcus, Mohanty – Tata McGraw Hill
6. Investment Management & Security Analysis: Text and Cases 2/e Khatri Macmillan
7. Investments Analysis & Management Charles P. Jones, Wiley India Edition
8. Investment Management by Preeti Singh - Himalaya Publishing House
9. Security analysis and portfolio Management by SudhindraBhat – Excel Books
10. Security analysis and portfolio Management by V.A.Avadhani - Himalaya
11. Security analysis and portfolio Management by Rohini Sing – Excel Books

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: IV

Paper: 405-AInternational Financial Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Fundamental of International Management **(05)**

a) International finance: Importance, goals,features, Nature & Scope
b) DomesticVsInternational finance
c) Emerging challenges & Responsibilities of finance Manager
d) Recent changes in Global Financial markets.
e) Globalization & international Financial Management

2) Foreign Exchange Market **(23)**

a) Structure/ Features of Foreign Exchange Market. (01)
b) Exchange Rate, (08)
   i) Forex reserves
   ii) Exchange rate theories
   iii) Currency future quotes
   iv) Speculations
   v) Hedging
   vi) International Parity
      (1) Exchange Rate Determination
      (2) Factor Affecting Exchange Rate
      (3) Balance of Payment & Purchasing Power Parity (PPP) theory of Exchange.
      (4) Real Exchange Rate & Real Effective Exchange Rate
      (5) Interest Rate & Exchange Rate
      (6) Covered Interest Rate & Interest Rate Parity, Forward Rate Parity
      (7) The Fischer Effect
      (8) Exchange Rate Forecasting
c) Global Markets (08)
   i) International Swap Market
      (1) Currency Swap
      (2) Fixed rate Currency Swap
      (3) Swap Risk
   ii) Global Financial Derivatives Market
      (1) Structure of Derivatives Market
      (2) Credit Default Swap
      (3) VaR methodology and Analysis
   iii) Financial Integration
   iv) Multinational's risk minimizing financing policy
   v) Monetary policy Globalization
d) Foreign Exchange Market in India (01)
e) Arbitrage- Two Point & Triangular Arbitrage (02)
f) Forward & future spot rate (01)
g) International Transaction Mechanism (02)
   i) Nostro, Vostro and Loro Account,
   ii) SWIFT, CHIP, CHAP, Telegraphic Transaction (IT)

3) International Working Capital Management (06)

a) Working capital policy
b) Managing Liquid asset
c) Inventory Management
d) Financing of foreign trade
   i) Documentation
   ii) Modes of Payment
   iii) Methods of Financing
   iv) EXIM Bank

4) International Accounting (05)

a) Concept
b) Consolidation of Financial Statements & its analysis
c) Foreign Currency Accounting
d) Accounting of Inflationary trends
e) Transfer pricing

5) International Monetary system (05)

a) International Monitory Fund (IMF)
   i) Constitution, Role & Responsibilityof IMF
   ii) Funding facilities, International liquidity
   iii) Special Drawing Rights (SDR)
   iv) Role in Post Bretton Woodsworld
b) Convertibility& Currency

6) Balance of Payment (06)

a) India's Balance of Payment
b) Importance, Functions, Principles& Componentsof Balance of Payment
c) Accounting of Balance of Payment: Deficit & Surplus
d) Elasticity approach Vs Absorption Approach
e) General Equilibrium approach
f) Balance of Payment Vs Exchange Rate
g) Balance of Payment and Money Supply

REFERENCE BOOKS:

1. International Financial Management by V.K. Bhalla – Anmol Publications
2. International Financial Management by P. G. Apte, Tata McGrawHill
3. International Financial Management by ThumuluriSiddaiah (IFM) Pearson
4. International finance Marketing by V.A Avadhani – Himalaya Publication
5. International Finance Management by vyuplesh saran – Prentice Hall
6. International Finance Management by Cheol S. Eun& Bruce G Resnick , Tata McGraw Hill
7. International Finance Management by MadhuVij – Excel Books
8. International Financial Management Jain Macmillan

The student has to Select and discuss the case studies related to paper no. 102, 205, and respective specialization papers no. 304, 305, 306, 307, 404, 405 those will have impact on business decision making in each paper.

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: IV

Paper: 404 B – Supply Chain Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Fundamentals of Supply Chain Management (SCM) **(08)**

a) Meaning & Importance of SCM
b) Supply Chain Linkage
c) Decision Phases in Supply chain
d) Mapping the supply chain
e) Supply chain Flows
f) Cycle View of Supply Chain
g) Supply Chain Relationships: Supplier-Buyer relationship
h) Factors affecting SCM performance
i) Enablers of Supply Chain Performance
j) Supply chain Performance in India

2) Logistic Management **(06)**

a) Definition, Objective Functions & Scope
b) Customer value chain
c) Logistical competence, competitiveness and competitive advances
d) Logistic for business excellence
e) Logistic solution
f) Role of Logistic in Supply Chain

3) Customer Service And Demand Management **(06)**

a) Relationship between customer and demand management
b) Customer service for competitiveness
c) Customer service phase
d) Service attributes
e) Customer service strategy
f) Value added logistical service

4) Supply Chain Management Mix **(16)**

a) Warehousing
   i) Concept & Functions
   ii) Warehouse Options
   iii) Warehouse Site Selection & Layout Design
   iv) Warehouse Costing
   v) Warehousing Strategies
   vi) Warehousing in India

b) Transportation
   i) Role of transportation in supply chain
   ii) Transportation Infrastructure
   iii) Factors affecting transportation in supply chain
   iv) Freight Management
   v) Factors influencing Freight cost
   vi) Transportation Network
   vii) Route Planning
   viii) Containerization
c) Logistical Packaging
   i) Consumer Vs Logistic Packaging
   ii) Packaging as Unitization
   iii) Design Considerations
   iv) Packaging Materials
   v) Returnable Logistic Packaging
   vi) Packaging Cost
d) Distribution
   i) Role of distribution in supply chain
   ii) Factors influencing distribution network design
   iii) Framework for Network design decisions
   iv) Evaluating Network design decisions using decision trees

5) Agile Supply Chain **(06)**

a) Supply chain for high demand uncertainty Environment
b) Responsive supply chain & its Approaches
c) Sources of supply chain disruption & its impact on business
d) Methods for handling Disruptions

6) IT & Supply chain **(08)**

a) Role of IT in supply Chain
b) IT in Supply Chain Transaction Execution
c) IT in Supply Chain Collabration& Coordination
d) IT in Supply Chain Decision Support
e) IT in Supply Chain Measurement & Reporting
f) Supply chain IT framework
g) Supply chain Management Applicaton Marketplace

REFERENCE BOOKS:

1. Supply Chain Logistics Management - Donald Bowersox , David Closs, M. Bixby Cooper – Tata McGraw Hill
2. Supply chain management by Janat Shah - Pearson
3. Logistic Management by V.V.Sople- Pearson
4. Logistic &Supply chain management by K.ShridharaBhat – Himalaya
5. Exploring the supply chain by Upendrakachru – Excel books
6. Logistical Management by Donald Bowersox , David Closs – Tata McGraw Hill
7. Supply chain management Concept and cases by Rahul V. Altekar - PHI
8. Supply Chain Management by Sunil Chopra, Peter Meindl - PHI Publications

North Maharashtra University, Jalgaon

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: IV

Paper: 405 B – Retail Management & Consumer Behavior

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

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1) Retailing Industry **(12)**

a) Retailing:
   i) Concepts of Retail, Retailing& Retail Management
   ii) Types and functions of Retailers
   iii) Characteristics, Role, Importance, functionsand Principlesof Retailing
   iv) Evolution of retailing in India- Growth, Reasons for growth,
   v) Emerging trends in retailing - New approaches in Retailing
   i) Global retailing trends - Opportunities & Threats in Global Retailing.

b) Retailing Formats
   i) Store-based
      (1) By Ownership
      (2) On the basis of Merchandise : Food-based & General Merchandise-based
   ii) Non Store-based : Traditional & Non-Traditional
   iii) Organized vs Un-organized Retailing

c) Drivers of Retail Change

d) Size of Retail in India &Challenges to Retail in India

e) Concept of Life cycle in Retail

2) Retailing Strategy **(08)**

a) Meaning of Retail Market Strategy, Specifics for Gaining sustainable competitive advantage,

b) Rural Retailing, The Strategic Retail Planning Process, Shopping trendsin Indian Retail Market, Consumerism & Ethics in Retailing

c) Retail Franchising: Concept, Evolution, Types, Advantages & Disadvantages

3) Merchandise Management **(15)**

a) Basics of Retail Merchandising: Meaning, Evolution
   i) Factors affecting buying functions
   ii) Roles & Responsibilities of Merchandiser & Buyer
   iii) Buying for a single store, chain store & Non store retailers
   iv) Lifestyle merchandising

b) Merchandising Planning : Concept
   i) Process of Merchandising Planning
      (1) Developing Sales forecast
      (2) Determining Merchandising requirements
      (3) Merchandising Control & Assortment planning

c) Retail Pricing : concepts & elements
   i) Determining price
   ii) Retail Pricing policies/ Strategies
   iii) Evaluation of Merchandise performance

d) Private label
   i) Concept: Store, Umbrella & Individual Brands
   ii) Need, & Evolution of Private label
   iii) Process of Private label creation
e) Category Management
   i) Concept
   ii) Reasons for emergence of category Management
   iii) Components of Category Management
   iv) Category Management business process
   v) Role of category captain
   vi) Drawbacks of category management

4) Retail Management Information System (05)

a) Need of technology & Product identification in retail
b) Importance of IT in retail
c) Factors affecting the use of IT in Retail
d) Radio frequency Identification (RFID)
e) Internet Retailing

5) Consumer Behavior (10)

a) Culture: Value & Norms, Regional & Religious influences on consumer behavior,
b) Reference Group & Social Influence, Age & Gender, Household influences on Consumer Behavior
c) Types of Family: Functions of Family, Family decision making, Family Life Cycle.
d) Consumer Behavior Outcome
   i) Diffusion of Innovation, Diffusion Process, Adoption Process,
   ii) Profile of Consumer Innovator.
e) Consumer Decision making & branding strategies
f) Diffusion of innovation
   i) Acceptance of New Product & Brand
   ii) Dimensions of Brand Diffusion
   iii) Why do brands fail
g) Retailing and consumer behavior

REFERENCE BOOKS:

1) Retail Management: Swapna Pradhan – Tata Mcgraw Hill
2) Retail Management by Berman& Evans - Pearson
3) Retail Management: Suja Nair, First Edition 2006
4) Retail Management : A global Perspective : Dr. Harjeet Singh – S. Chand & Sons
5) Retailing- Cox &Brittain – Pearson
6) Principles of retail Management – Rosemerry&Mohd. Raffik – Palgrave
7) Consumer Behaviour& Branding: Conepts readings & Cases by Kumar - Pearson
8) Consumer Behavior: SatishBatra& SHH Kazmi, Excel Books
9) Consumer Behavior: Schiffman&Kanuk- Pearson
10) Consumer Behavior (SIE): Building marketing strategy by Hawkins, Best, Coney, Mookerjee – Tata McGraw Hill

The student has to Select and discuss the case studies related to paper no. 207, and respective specialization papers no. 304, 305, 306, 307, 404, 405 those will have impact on business decision making in each paper.

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(NACC Accredited 'B' Grade University)

FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: IV

404 C – Performance & Compensation Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. Performance Management **(08)**

a. Meaning, Definition & Purpose
b. Standards of Performance
c. Guidelines for setting Performance Standards
d. Checklist for performance standard
e. Determinants of Performance
f. Factors influencing Determinants of Performance
g. Performance Dimensions
h. Approaches to measuring performance
i. Characteristic of an Ideal PM System
j. Disadvantages of poorly implemented PM System

2. Performance Management Process **(06)**

a. Prerequisites
b. Performance planning,
c. Performance execution,
d. Performance Assessment
e. Performance Review
f. Renewal & Re-contracting

3. Employee Development **(06)**

a. Personal Development Plans
b. Direct supervisors role
c. 360 Degree feedback system
d. Characteristic of a good system
e. Coaching process
f. Performance review Meetings

4. Managing Team Performance (TPM) **(05)**

a. Definition & Importance of teams
b. Types of teams
c. Purposes & Challenges of TPM
d. Rewarding Team Performance

5. Compensation Management **(06)**

a. Meaning, Concept, &Objectives Of Compensation
b. Compensation Management Process
c. Types Of Compensation
d. Job Valuation
e. Methods Of Job Valuation
f. Dimensions of Compensation System
g. Components of Wage Structure in India
h. Managerial Compensation

6. Wage & Salary Administration **(05)**

a. Minimum Wage, Fair wage & Living Wage
b. Objectives of Sound Wage Policy
c. Principles of Wage & Salary Administration
d. Wage Determination
e. Wage Boards
f. Methods of Wage Payments
g. Wage/Salary Differentials

7. Incentives **(06)**

a. Meaning Of Incentives
b. Need Of Incentives
c. Classification Of Incentives
d. Merits Of Incentives
e. Problems Arising Out Of Incentives
f. Time Based Individual Incentive Plan
g. Out Based Individual Incentive Plan
h. Group Incentive Plan

8. Fringe Benefits **(04)**

a. Meaning Of Fringe Benefit
b. Need Of Fringe Benefit
c. Objectives Of Fringe Benefit
d. Types Of Fringe Benefits
e. Advantages Of Fringe Benefits
f. Disadvantages Of Fringe Benefits

9. International Pay & Rewards **(04)**

a. Cross national Variation in Rewards structure
b. The space for International Reward Strategy
c. Best Practices in International Rewards

REFERENCE BOOKS:

1. Performance Management by Herman Aguinis.- Pearson
2. Compensation by Milkovich, Newman, VenkataRatnam – Tata McGraw Hill (SiE)
3. Managing Human Resources By Fisher, Schoenfeldt, Shaw- Cengage Learning
4. International Human Resource Management by Tony Edwards & Chris Rees.- Pearson
5. Human Resource Management by D.K Bhattacharya – Excel Books
6. Compensation Management in a Knowledge-based world by Henderson - Pearson
7. Human Resource Management, Text & Cases By Dr. V.S.P Rao - Excel Books
8. Essentials of Human Resource Management By P. SubbaRao – Himalaya Publishing
9. Human Resource Management By Snell, BohalenderCengage Learning
10. Performance Management Chadha Macmillan
11. Human Resource Management by S S Khanka – S. Chand & Sons

North Maharashtra University, Jalgaon

(NACC Accredited 'B' Grade University)

FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: IV

405 C – International Human Resource Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. Introduction To (IHRM) International Human Resource Management (10)

a. IHRM: Definition,
b. Internationalization & HRM
c. Domestic Vs International HRM
d. Growing interest in IHRM
e. Functional positioning of IHRM
f. Organizational context of IHRM
g. Building Strategic IHRM Capabilities
h. Role of economic Development in IHRM
i. Factors affecting an MNE's IHRM Policies & Practices
j. International Division of Labour
k. Barriers to effective Global HRM

2. Social and Cultural Context of IHRM (08)

a. Culture & Cultural Sensitivity
b. Social Environment
c. Religions and Economic Implications
d. Multiculturalism
e. Cultural Predisposition
f. Cultural Dimensions
g. Managing across culture

3. International Joint Ventures (08)

a. Concept & Nature of International Joint Venture
b. Motives & Extent of Merger & Acquisitions
c. HRM factors in IJV
d. Role & impact of Culture in International Joint Venture
e. Methods of Overcoming Cultural &other Problems in IJV

4. Human Resource Practices in International environment (10)

a. Global HR Planning
b. Recruitment and Selection in International Context
    i. Company Motive
    ii. Individual Motive
    iii. Recruitment Methods
    iv. Selection Criterion & Techniques
c. Emerging trends in training for competitive advantage
d. Developing staff through International assignment
e. Women Expatriates -The Glass Ceiling Phenomenon

5. International Industrial Relations **(07)**

a. Key Issues in International IR
b. Trade Union & International IR
c. IR policy of MNC's
d. MNC's Characteristic in Neutralizing the power of Labour Unions
e. MNC's Strategy towards International IR

6. Repatriation **(07)**

a. Concept of Repatriation
b. Benefits from returnees
c. Challenges of Re-entry
    i. Individual Perspective
    ii. Organisational Perspective
d. Repatriation Process
e. Managing repatriation

REFERENCE BOOKS:

1. International Human Resource Management by K. Ashwathappa – Tata McGraw Hill
2. International Human Resource Management by Tony Edwards & Chris Rees.- Pearson
3. International Human Resource Management by Peter Dowling &Denice Welch – Cengage Learning
4. International Human Resource Management by Sengupta, Bhattacharya – Excel Books
5. International Human Resource Management By P. SubbaRao – Himalaya Publication
6. International Human Resource Management by P L Rao – Excel Books
7. International Human Resource Management (2/e) by Gupta -Macmillan

1. The student has to Select and discuss the case studies related to paper no. 106, 206, and respective specialization papers no. 304, 305, 306, 307, 404, 405 those will have impact on business decision making in each paper.

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: IV

404 D –Industrial & Productivity Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Introduction to Industrial Engineering and Management (06)

a) Indian Industry
b) Stages of Scientific & Technological Revolution
c) Growth of Indian Manufacturing Industry
d) New Industrial Policy
e) Major Areas of Indian Industry
f) Globalization of Indian industry

2) Work Study (08)

a) Definition, concept, need and advantages of Work Study
b) Objectives of Method Study
c) Procedure/steps of Method Study
d) Recording Techniques
e) Micro-motion study and Therbligs
f) SIMO Chart
g) Principles of motion economy

3) Work Measurement (09)

a) Concepts of Work measurement and its objectives
b) Techniques and uses of work measurement
c) Time Study and Methods of timing
d) Work Sampling
e) Predetermined motion time & Systems (PMTS)
f) Method Time Measurement (MTM)
g) Work factor
h) Use of Motion Time Tables
i) Ergonomics

4) Productivity (09)

a) Concept, Importance & Benefits of Productivity
b) Productivity & Production
c) Measurement of productivity
d) Productivity Index
e) Means of increasing productivity
f) Productivity improvement procedure
g) Six lines of Attack to improve Productivity
h) Productivity & Standard of Living

5) Waste Scrap & Disposal Management (08)

a) Types & Cost of wastages
b) Causes and Remedies of wastage
c) Wastage of resources and preventive steps
d) Wastage control Programme and Salvage operation
e) Scrap Disposal and Surplus

6) Constraint Management (12)

a) Managing constraints across the organization
b) Theory of Constraints (TOC)
   i) Measuring capacity, utilization & Performance
   ii) Principles of TOC
c) Identification & Management of Bottleneck
d) Product mix decisions using bottlenecks
e) Economies of scale
f) Capacity timing & Sizing strategies
g) Procedure for long term capacity Decisions
   i) Estimate capacity Requirement
   ii) Identify Gaps
   iii) Develop Alternatives
   iv) Evaluate alternatives

REFERENCE BOOKS:

1) Industrial Engineering and Production Management by M. Mahajan, DhanpatRai and Sons.
2) Operations Management by Krajewski, Ritzman, Malhotra - Pearson
3) Industrial Engineering and Management by O.P. Khanna, DhanpatRai and Sons.
4) Industrial and Business Management by MartandTelsang, S. Chand
5) Purchasing and Supply Management- Donald Dobler and David Burt-Tata McGraw Hill
6) Materials Management by P Gopalkrishnan and M Sundaresan- Tata McGraw Hill
7) Materials Management – Rajendra Mishra – Excel Bookss
8) Purchasing and Materials Management-NK Nair-Vikas
9) Operations &Materials Management by K. ShridharBhat –HPH
10) Production and Operations Management – Chary - Tata McGraw Hill

North Maharashtra University, Jalgaon

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

Paper: 405 D – International Quality Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1) Foundations of Quality Management (10)

a) Quality: Meaning, Definition, Importance, Dimension, Types, Benefits
   i) Five views of Quality
   ii) Quality & Competitive advantage
   iii) Quality & Profitability
   iv) Quality as a source of value

b) Quality Management:Principles,
   i) Traditional Vs. Modern Quality Management
   ii) Strategic Quality Management

c) Total Quality Management (TQM) : Meaning, Scope & Elements
   i) TQM Vs. Traditional Management Practices

d) Deming's Quality Principles

2) Administrative systems for Quality Management (10)

a. The Fork model for quality management- The Handle
b. The Fork model for quality management- The Neck
c. The Fork model for quality management- Daily Management
d. The Fork model for quality management- Cross-functional Management
e. The Fork model for quality management- Policy Management
f. Resource requirements of the detailed fork model

3) ISO series of Standards (08)

a. ISO 9000-2000 system
b. ISO 9001-2000 system
c. ISO 9004-2000 system
d. ISO 14000 Series
e. QS 9000 Series

4) Total Quality Management (06)

a. TQMEX model
b. Japanese 5-S practice
c. Quality control circles
d. Business process Re-engineering

5) Six Sigma Management (08)

a. Concept, Six Sigma Terminology
b. DMAIC Model
c. Benefits and Costs of Six Sigma Management
d. Six Sigma Roles and Responsibilities

6) Kaizen **(08)**

a. Concept
b. Kaizen versus innovation
c. Kaizen and Management
d. Companywide Quality control
e. Characteristics of Companywide Quality control
f. Kaizen Strategy and Practice

REFERENCE BOOKS:

1) Quality Management by Howard Gitlow, Alan J, Rosa O, David Levine, Mcgraw-Hill, 3rd Edition
2) Total Quality Management- PoornimaCharantimath, Pearson Education
3) Total Quality Management - ShridharBhat - Himalaya Publishing House
4) Total Quality Management- Besterfield, Pearson Education
5) Total Quality Management- S.D. Bagade, Himalaya Publishing House
6) Total Quality Management – Shailendra Nigam – Excel Books
7) Total Quality Management - ShridharBhat- Himalaya Publishing House

The student has to Select and discuss the case studies related to paper no. 105 and respective specialization papers no. 304, 305, 306, 307, 404, 405 those will have impact on business decision making in each paper.

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: IV

404-408 E International Business Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. Study of following economic parameters in Countries: (40)

Countries

- United Kingdom
- United States of America
- China
- Russia
- Brazil
- Japan
- South Africa
- Australia

Parameters

a) National Income
b) Natural Resources
c) Population
d) Currency
e) Trade and Industry
f) Taxation System
g) Opportunities to Indians

2. Integration among the countries (Objectives & Functioning only) (10)
   a) SAARC
   b) ASEAN
   c) BRIC
   d) OPEC
   e) G8 and G20
   f) OECD
   g) United Nations (UNO)
   h) NAFTA
   i) European Union

References

1. China's Economy by Christopher Rowe – Granada Publishing, New York
2. Austrilian Economy by peter Kriesler –Allen &Unwin Publishing
3. Japan in the world economy by Béla A. Balassa, Marcus Noland– Institute for International Economics
4. The US Economy by Debra A Miller - Greenhaven, 2010
5. The UK Economy by Malcolm C. Sawyer -Oxford University Press
6. Everyone's guide to the South African economy by André Roux – Zebra Press
7. Political economy of Brazil: recent economic performance by PhilipArestis, Alfredo Saad-Filho - Palgrave Macmillan
8. The Russian economy: from Lenin to Putin By Steven Rosefielde – Blackwell publishing
9. www.wikipedia.org
10. www.oecd.org
11. www.saarc-sec.org
12. www.aseansec.org

7. Introduction To (IHRM) International Human Resource Management (10)

a. IHRM: Definition,
b. Internationalization & HRM
c. Domestic Vs International HRM
d. Growing interest in IHRM
e. Functional positioning of IHRM
f. Organizational context of IHRM
g. Building Strategic IHRM Capabilities
h. Factors affecting an MNE's IHRM Policies & Practices
i. International Division of Labour
j. Barriers to effective Global HRM

8. Social and Cultural Context of IHRM (08)

a. Culture & Cultural Sensitivity
b. Social Environment
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    ii. Individual Motive
    iii. Recruitment Methods
    iv. Selection Criterion & Techniques
c. Emerging trends in training for competitive advantage
d. Developing staff through International assignment
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b. Trade Union & International IR
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e. MNC's Strategy towards International IR

12. Repatriation **(07)**

a. Concept of Repatriation
b. Benefits from returnees
c. Challenges of Re-entry
    i. Individual Perspective
    ii. Organisational Perspective
d. Repatriation Process
e. Managing repatriation

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4. International Human Resource Management by Sengupta, Bhattacharya – Excel Books
5. International Human Resource Management By P. SubbaRao – Himalaya Publication
6. International Human Resource Management by P L Rao – Excel Books

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: IV

Paper: 406 E – Cases in International Business Management

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

The student has to Select and discuss the case studies related to respective specialization papers no. 304 E, 305 E, 306 E, 307 E, 404 E, and 405 E those will have impact on business decision making in each paper.

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: III

Paper: 404 F – Rural Development

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. **Rural Development**
   a. Nature & Scope of Rural Development
   b. Importance of Rural Development
   c. Objectives of Rural Development

2. **Approaches to Rural Development**
   a. Community Development Programme
   b. Intensive Agricultural District Programme
   c. Growth Center Strategy
   d. Concept of Integration
   e. Micro level planning

3. **Special Schemes for Rural Development**
   a. Stress on special schemes
   b. Limitations of special schemes
   c. Strengthening special schemes

4. **Employment Generation Programs**
   a. Crash scheme for Rural Development
   b. Pilot Intensive Rural Employment projects
   c. Antyodaya
   d. Employment Guarantee scheme
   e. Food for work programme
   f. National Rural Employment Generation Guarantee
   g. Rural Landless employment Guarantee programme
   h. JawaharRojgaryojana
   i. Jawahar Gram samridhiyojana

5. **Role of Banking in Rural Development**
   a. Growth of Cooperative Banking in Rural sector
   b. Role of Commercial Bankings in Rural sector
   c. NABARD, its Schemes & Patterns

6. **Integrated Rural Development Programme**
   a. Sailent features of IRDP
   b. Targets & Achievements of IRDP
   c. Major problems in IRDP
   d. Strengthening IRDP
   e. Swarnajayanti Gram Swarojgaryojana (SHSY)

7. Rural Development Administration and Panchayati Raj Institution

a. Functions of Panchayati Raj System
b. Merits & demerits of Panchayati Raj System
c. Strengthening the Panchayati Raj System
d. Rural Development Administration

REFERENCE BOOKS:

1. Rural Development by – Dr. I. SatyaSundaram
2. Rural Development and Planning in India – Devendra Thakur, Deep & Deep Publications, New Delhi
3. Rural Industrilisation in India – Shrinivas Thakur – StrelingPublishess, New Delhi
4. Dynamics of Rural Development Powar Structure – S.N. Chandhary – Amar Prakashan, New Delhi.
5. Integrated Rural Development Programme in India : Policy & Administration – A.K. Shrivastva – Deep & Deep Publications, New Delhi.
6. Integrated Rural Development – R.C. Arora – S. Chand Sons, New Delhi.

Paper: 405 F – Management of Agri Business Projects

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. **Introduction to Project Management**
   a. Search for a Business Idea, Concepts of Project
   b. Project Identification, Project Formulation
   c. Project Analysis, Project Risk
   d. Project Planning, Project Design and Network Analysis
   e. Project Report, Project Appraisal
   f. Location of an Enterprise, Factory Design and Layout
2. **Financial Analysis**
   a. Financial Analysis, Funds flow analysis
   b. Ratio Analysis, Investment process
   c. Break Even Analysis, Profitability analysis
   d. Social Cost- Benefit Analysis, Budget and planning Process, Benchmarking
3. **Project Finance**
   a. Source of Development of Finance, Project Financing
   b. Institutional Finance to Entrepreneurs, Financial Institutions, Working Capital Management, Incentives and Subsidies
4. **Policies**
   a. Policies Governing Entrepreneurship, Applicability of the Factories act, Role of Consultancy Organisation
   b. Role of Various Government Institutions for Promoting Agricultural Projects
5. **Project Reports**

   Preparation of Project Reports for-
   a. Dry Grains
   b. Fertilizer / Pesticides
   c. Live Stocks
   d. Floriculture&Horticulture
   e. Milk & Milk Products
   f. Medicinal Plants
   g. Agro Tourism
   h. Irrigation
   i. Extraction of Plants and Grains

REFERENCE BOOKS:

1. Project Management- Vasant Desai- Himalaya Publication
2. Jain, S.C. - Management in Agricultural Finance.- Vora and Company. Publishers Pvt. Ltd.
3. Karla O.P.- Agricultural Policy in India – Bombay Popular Prakashan Mumbai
4. Banerjee, G.C. – Text Book of Animal Husbandry – Oxford & IBH Publisher New Delhi.
5. Rajagopal- Organizing Rural Business Policy Planning and Management- Sage Publication, New Delhi.
6. Pandey, Mukesh and Deepak Tiwari-Rural and Agricultural Marketing -International Book Distribution Co. New Delhi.
7. Iwase- Smita. - Agri-Business Management- Everest Publishing House

The student has to Select and discuss the case studies related to respective specialization papers no. 304, 305, 306, 307, 404, and 405 those will have impact on business decision making in each paper.

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: IV

Paper: 404G: INFORMATION SYSTEMS AUDIT

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. Overview of Information Systems Auditing – Need for Control and Audit of Computers, Effect of Computers on Internal Controls, Effect of Computers on Auditing, Foundations of IS Auditing **(5)**
2. Conducting an Information Systems Audit – Introduction, The Nature of Controls, Dealing with Complexity, Audit Risks, Types of Audit Procedures, Steps in Audit, Auditing Around or Through the Computer, introduction to Security Standards – ISO 27001 **(6)**
3. Top Management Controls and Systems Development Controls – Evaluation of Planning, Organizing, leading and Controlling functions, Approaches to Auditing Systems Development, Models for Systems Development, Evaluating Major Phases in Systems Development Process **(6)**
4. Programming Management Controls – Program Development Life Cycle, Programming team organization, Managing the Programming Group **(5)**
5. Data Management Controls – Functions and motivations of DA and DBA roles, Organizational Issues, Data Repository Systems, Control over DA and DBA **(6)**
6. Security Management Controls – Introduction, Conducting a Security Program, Major Security Threats and remedial measures, Controls of last resort – DRP, Insurance **(5)**
7. Input / Output and Operational Controls – Data preparation and entry, Production control, Library, Documentation and Program Library, Help desk and Technical Support, Capacity Planning and Performance Monitoring, Managing Outsourced operations, Check Digits, Batch Controls, Audit Trail Controls, Exposures in Communication subsystem, Controls over the Subversive Threats, OS Integrity Checking, Built in validation checks in Software, Online output Production and Distribution Controls **(11)**
8. BCP and Cyber Crimes – Difference between BCP and DRP, Social Engineering, Data Diddling, Denial of Service attack, Sniffing, Man in Middle attack, Identity Theft and spoofing – Phishing, Pharming, SQL Injection, Zeroth Day Attacks. **(6)**

REFERENCE BOOKS:

1. Information System Control and Audit – Ron Weber – Pearson Education
2. Information System Audit and Assurance – D.P. Dube and V.P. Gulati – Tata McGraw Hill
3. ISACAs IT Audit standards

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: IV

Paper: 405G: INTERNET TECHNOLOGY

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

1. **HTML**

A.HTML Basics

Introduction to HTML
WWW
Web Publishing **(2)**

B. Designing

Contents – Blocks, Text, Form Elements
Links – To a page, Within Page, To a Site.
Links And Images – Image Mapping-
Server Side, Client Side
Layout – List (OL, UL, DL) - Tables- Frames (Nested, I Frame)
Head Elements – Base Font, Meta Tags, Scripts, Styles **(5)**

C. CSS

Inline
Embedded
Sep. /External
Transaction Effect
Client Pull **(3)**

D. Introduction To XML **(3)**

E. ASP

A. Getting started with active server
Pages
What are ASPs?
Understanding Client – Server Model
ASP versus Client side Scripting
Setting PWs and/or IIS
ASP tools like Visual Interdev or Font Page **(3)**

B. Dissecting your First ASP Script.
Understanding ASP Script.
ASP Browser
ASP Process
Concept of File Inclusion. **(3)**

C. Working with variables
Definition and Naming rules
Data Types
Constant, Arrays
Operators **(3)**

D. Understanding VB Script Control
Structures
Conditional
Looping
Branching **(2)**

E. Using VB Script Built-in Function
Typecasting Variables
Math, Date, String, Formatting -Functions. **(2)**

F. Using Database
Reading From a Database Using ASP
Inserting, Updating, and Deleting Database records

REFERENCE BOOKS:

1. The Complete Reference to HTML - Thomas Powell
2. Dynamic HTML for Dummies – Michael Hyman
3. ASP Developers Guide – Greg Vuczek
4. ASP in 21 Days – Scott Mitchell and James Atkinson
5. ASP 3.0 – A Beginner's Guide – Mercer
6. HTML - Beginner's Guide - Willart
7. Microsoft Office 2003 Front page Inside Outside

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FACULTY OF COMMERCE & MANAGEMENT

New Syllabus: M.B.A.

SEMESTER: IV

Paper: 406G: INFORMATION TECHNOLOGY AND SOFTWARE PROJECT MANAGEMENT

60 + 40 Pattern: External Marks 60 +Internal Marks 40 = Maximum Total Marks: 100

Required Lectures: 50 hours

I. Software Project Management

Overview of COCOMO Model, PERT/CPM, Reileigh Curve
Project Organization
Risk Management
Project Finance
Procurement Management
Project Scheduling
Project Quality Management
Communication Management **(10)**

II. Software Project Management

Resources Planning and Estimation
- Different Methods of estimation in brief
- Function Point Analysis in some details

Use of CASE Tools
Introduction to MS Projects
Design and Development
- Schedule
- Resource Allocation
- Progress Review
- Review - Design and Walkthroughs

Testing
- Overview of
- Test Plan
- Generation of Test Cases, Test Data
- Types of Testing
- Quality Concepts - ISO, CMM

Production / Implementation
- User Acceptance Tests
- Parallel Runs
- Change Management

Maintenance
- Types - Adaptive, Corrective, Preventive
- Version Control and Configuration Management

Documentation Methods for all these topics
Aspects specific to Generic Product Development vis-à-vis user specific application development **(20)**

III. IT Management

Acquisition Process - Hardware, Software, Network, Infrastructure
- Requirement Planning
- Sizing
- Selection Methodology including Benchmarking
- Documents involved

IT HRM
- Selection
- Retention
- Training
- Career Path Planning

IT Operations
- Scheduling
- Roles and Responsibilities
- Procedures

Performance Evaluation
- Broad methods for Hardware, Software and Personnel **(20)**

REFERENCE BOOKS:

1. Software Project Management - Edwin Bennetan
2. Software Engineering - Roger S. Pressman
3. Software Engineering - Martin L. Shooman
4. TQM for Computer Software - Dunn and Ulman
5. Management of Information Technology - Pravin Muley
6. Software Project Management Goyal Macmillan

North Maharashtra University, Jalgaon

First year term I
ME Civil Engineering (Environmental Engineering)
Examination scheme and structure with effect from year 2010 – 11
First Year Term – I

Sr. No.	Subject	Teaching Scheme per week		Examination Scheme				
		L	P	Paper Hr.	Paper	TW	PR	OR
1	Environmental Engineering Microbiology	3	--	3	100	--	--	--
2	Design operation and maintenance of water supply and sewerage system	3	--	3	100	--	--	--
3	Air pollution	3	--	3	100	--	--	--
4	Environmental Engineering Chemistry	3	--	3	100	--	--	--
5	Elective-I	3	--	3	100	--	--	--
6	Laboratory Practice-I	--	6	--	--	100	--	50
7	Seminar-I	--	4	--	--	100	--	--
Total		15	10		500	200		50
Grand Total		**25**		**750**				

Elective-I

1) Environmental Sanitation
2) Remote Sensing GIS and its environmental application
3) Rural water supply and sanitation

ME Civil Engineering (Environmental Engineering)
First Year Term – II

Sr. No.	Subject	Teaching Scheme per week		Examination Scheme				
		L	P	Paper Hr.	Paper	TW	PR	OR
1	Advanced Water Treatment Technology	3	--	3	100	--	--	--
2	Advanced Waste Water treatment Technology	3	--	3	100	--	--	--
3	Industrial water and waste water Management	3	--	3	100	--	--	--
4	Water shed management	3	--	3	100	--	--	--
5	Elective-II	3	--	3	100	--	--	--
	Laboratory Practice-II	--	6	--	--	100	--	50
	Seminar-II	--	4	--	--	100	--	--
Total		15	10	--	500	200		50
Grand Total		**25**		**750**				

Elective II

1) Design of Water Supply and Waste Water structure
2) Environmental impact Assessment
3) Solid Waste and Management

ME Civil Engineering (Environmental Engineering)
Second Year Term I

Sr. No.	Subject	Teaching Scheme per week		Examination Scheme				
		L	P	Paper Hr.	Paper	TW	PR	OR
1	Seminar – III	--	4	--	--	50	--	50
2	Project Stage – I	--	18	--	--	100	--	--
Total		--	22	--	--	150	--	50
Grand Total		**22**		**200**				

ME Civil Engineering (Environmental Engineering)
Second Year Term II

Sr. No.	Subject	Teaching Scheme per week		Examination Scheme				
		L	P	Paper Hr.	Paper	TW	PR	OR
1	Progress Seminar	--	--	--	--	50	--	---
2	Project Stage - II	--	18	--	--	150	---	100
Total		--	18	--	--	200	--	100
Grand Total		**18**		**300**				

North Maharashtra University, Jalgaon

ME Civil Engineering (Environmental Engineering)

Examination scheme and structure with effect from year 2010 – 11

First year term I

1) ENVIRONMENTAL ENGINEERING MICROBIOLOGY

Lectures – 03 Hours / Week	Theory 100 marks
Tutorial - 01Hours/week	Min passing 40 marks
Term work 50 marks	Duration - 03Hours

Role of microorganisms in environmental engineering. Microorganism classification, bacteria, Algae, Fungi, Protozoa, Crustacea, Rolifers, Oligochaeta, Parasites. Observation of microbes. Biochemical reactions. Metabolic activities. Role of enzymes. Pure and mix culture. Biodegradibilty. Factors affecting biodegradability, ph, temperature, nutrition, salt concentration, toxicity, osmotic pressure etc. Optimum conditions for growth, oxygen requirement.

Bacterial metabolism- oxidation of carbohydrates Protein and fats under aerobic and anaerobic conditions, Carbon, Nitrogen and Sulfur cycles in nature.

Role and micro-organisms in the treatment of sewage and industrial wastes by different methods.

Synthesis, growth and death of microorganisms, population dynamics.

Role and significance of bacteria and viruses in potable water, occurrence of water borne diseases and their prevention, Bacterial indicators of pollution.

M. P. N. techniques and bacterial colony counting, M. F. technique – principle, procedure, limitation of test, Interpretation of analytical results. Bacteriological standards for raw and treated waters.

Applied microbiology of domestic sewage and industrial wastewater. Anaerobic and aerobic metabolic pathways.

Microbial inner look into various wastewater treatment systems including trickling filter, activated sludge process, oxidation ponds, anaerobic digesters.

Role of microorganisms in solid waste disposal, pathogenic aspects of landfilling and composting, microbiological factors affecting performance of landfills and composting plants.

Effect of radioactivity on microorganisms. Milk and food sanitation. Air born disease, spread and control of air born diseases. Biological indicators of pollution. Control of Algae and other Biological growth in water supplies.

Term work:

1. Determination of MPN index of a given sample of water.
2. Study of optical microscope and its setting.
3. Preparation of culture media.
4. Acclimatization of bio mass and its concentration under aerobic conditions.
5. Determination of B Coli count of water by membrane filtration method.
6. Study of microbes under microscope and staining of microorganisms.
7. Study of heavy metals on microorganisms.
8. Five Assignments based upon above syllabus.

Books:

1. Microbiology for sanitary engineer by McKinney.
2. Sanitary microbiology by Gauddy and Gauddy.
3. Microbiology by Pelzar.

2. ENVIRONMENTAL ENGINEERING CHEMISTRY

Lectures – 03 Hours / Week
Tutorial - 01Hours/week
term work 50 marks

Theory 100 marks
min passing 40 marks
Duration - 03Hours

Basic concepts from general chemistry- elements, atomic weights, gram atomic weights, compounds, mole, avagadro's number, valancy, oxidation state, nomenclature, chemical equations and weight relationship, oxidation-reduction, gas laws, solutions, Le Chatelier's principal, , ionization, common ion effect,
shifting chemical equillibria, amphotermic substances.

Basic concepts from physical chemistry- thermodynamic aspects, energy, enthalpy, entropy, Gibb's free energy, vapor pressure, surface tension, solution of solids in liquids, osmosis, dialysis, solvent extraction, electrochemistry, chemical kinetics, catalysis, adsorption,.

Basic concepts from organic chemistry- carbon atom, isomerism, hydrocarbons, alcohols, aldehydes, ketones, acids, esters, ethers, alkyl halides, amines, amides, cyclic aliphatic compounds, aromatic compounds, phenols, heterocyclic compounds, dyes, common foods, trace organics, detergents, pesticides.

Basic concepts from equilibrium chemistry- limitations of equlibrium calculations, ion activity coefficients, acids and bases, buffers, solubility, complex formation, oxidation-reduction, preliminary numerical treatment with these topics.

Basic concepts from colloid chemistry- colloid, methods of formation, dispersion of colloids in liquids, dispersion in air.

Basic concepts from biochemistry chemistry- enzymes, cofactors, temperature dependence, pH, trace elements, biochemistry of protines, biochemistry of fats, biochemistry of carbohydrates, energetics and bacterial growth.

Standard methods of examination of waters and wastewaters, standard solutions, primary and secondary standards, colorimetry.

LIST OF PRACTICALS:

1. Preparation of standard solutions.
2. Determination of conductivity
3. Kijedahl Nitrogen determination.
4. Calcium, magnesium and total hardness.
5. Determination of Iron using spectro photometry
6. Determination of chromium using spectro photometry
7. Determination of fluoride using spectro photometry
8. Residual chlorine determination..
9. Determination of Dissolved oxygen of a given sample of water.
10. Determination of Biochemical oxygen demand of a given sample of wastewater using acclimatized bio mass..
11. Determination of TOC of a given sample of wastewater.
12. Determination of IOD of a given sample of wastewater.

Any ten experiments out of the twelve experiments given above must be performed.

Books:

1. Chemistry for environmental engineering: Sawyer and McCarty, TMC Publication N Delhi.
2. Physical chemical and organic chemistry by Bahal and Tuli, Khanna publication New Delhi.

3. DESIGN OPERATION AND MAINTENANCE OF WATER SUPPLY AND SEWERAGE SYSTEM.

Lectures – 03 Hours / Week
Tutorial - 01Hours/week
term work 50 marks

Theory 100 marks
min passing 40 marks
Duration - 03Hours

Importance of sewerage system. General History of water supply and sewerage system in India. Development in different five year plans, Future scope.
Estimation of water requirements and flow into sewers.

Sources of water, Surface and underground sources. Intake structures, construction and maintenances of wells and infiltration galleries. design of intake structures.

Transmission of water, Types and materials of conduits, Hydraulic characteristics, Water hammer appurtenances, Pumping of water, types, design and selection.
Types of pumps, Economics of pumps and rising main.
Distribution of water, Pressure and capacity requirement of systems. Field and office analysis of distribution network, Service reservoir. Maintenance of distribution system. Emergency disinfections of mains.

Sewerage System : Patterns of sewerage systems, kinds of sewer.

Design of sewerage systems : Hydraulics of sewers. Flow at sewer transitions. Length of side weirs and capacity of street inlets, Estimates of sewage flow. Storm water runoff. Design and layouts of sanitary and combined sewerage systems. Maintenances of sewers.

Sewer Appurtenance : Manholes, flushing tanks. Inverted siphons, Regulators., design and working principal

Pumping of sewage: Necessity, Types and characteristics of pumps. Typical problems in sewage pumping.

Plumbing requirements of tall buildings: design of water supply and sewerage for houses, numerical treatment.

Term work: term work shall be based upon ten assignments based upon the above mentioned syllabus. The assignments should base upon following topics:

a. Significance of sewerage and eater supply systems and their history. (one assignment)

b. Design of intake structure. (one assignment)

c. Design of pressure mains (one assignment)

d. Materials, layout and maintenance of pipes network. (two assignments)

e. Design of pipe network. (two assignments)

f. Estimation of run off and sewerage (one assignment)

g. Design of sewer (two assignments)

h Lay out and maintenance of sewers (one assignments).

Books:-

1. Water & Wastewater Technology:- Mark J. Hammer
2. Pumping and collection of wastewater, Meclaf and eddy Inc.
3. Water supply & Wastewater engineering :-B.S.N. Raju
4. Water supply engineering :-Dr. P. N. Modi.

4. AIR POLLUTION

Lectures – 03 Hours / Week
Tutorial - 01Hours/week
term work 50 marks

Theory 100 marks
min passing 40 marks
Duration - 03Hours

Definitions, energy environment relationship.

Importance of air pollution studies in modern world, elements of air pollution, sources of air pollution, effects of air pollution on human beings, plant, animals, property. Economic effects of air pollution. Global and local effects of air pollution. Case studies of India and world. Permissible air pollution. Ambient and effluent standards.

Nature's cleaning mechanism. Point source. Atmospheric conditions and dispersion of air pollution, various types of plume behaviors, Guassian dispersion equations, their limitations, numerical treatment. Estimation of dispersion of air pollution from a given height of stack under given atmospheric conditions, plume rise estimation, estimation of maximum concentration under given conditions, calculation of required height for permissible concentration. Concept of line source.

Air pollution from thermal power plant, their characteristics and control.

Air sampling methods and equipments. Analytical methods for air pollution studies, smoke survey, planning an air pollution survey.

Particulate matter and its control by equipments. Working principal, advantages,

Disadvantages, design and applications of various types of particulate control devices. Concept of bio filters.

Automobile air pollution, types, control methods, effect of A/F ratio.

Photochemical smog formation, bad effects, control.

Control of air pollution : strategy, effect of town planning, road conditions, vehicle condition etc. history of air pollution legislation in India. Life style and air pollution.

Glance over present day global and Indian scenario of air pollution.

Term work:

1. Ten assignments based upon above syllabus.

The assignments shall be based upon following topics:

a. Automobile air pollution and its control (one assignment)
b. Meteorological factors and their influence on air pollution dispersion, plume behavior (two assignments)
c. Life style and air pollution control (one assignment)
d. Energy utilization and environmental degradation (one assignment)
e. Estimation of effective height of stack (one assignment)
f. Estimation of required height of stack for pollution control under given environmental conditions (two assignments)
g. Global environmental phenomenon (two assignments).

2. Visit to a site where air pollution control device is working.
3. Practical:
    a. Air pollution sampling using high volume sampler.
    b. Automobile air pollution sampling using auto exhaust analyzer.
    c. Study of functioning of air pollution control devices installed at sites.

Books:-

1. Air pollution:- A C Stern.
2. Air pollution :-M N Rao & H V N Rao
3. Air pollution engineering by Perkins.
4. Air pollution control technology: Wark and Warner.

5. *ELLECTIVE-I*

1. ENVIRONMENTAL SANITATION

Lectures – 03 Hours / Week
Tutorial - 01Hours/week
term work 50 marks

Theory 100 marks
min passing 40 marks
Duration - 03Hours

Definitions, environment and its effect on public health, global environmental sanitation history, problem of environmental sanitation in India.

Refuse Collection And Disposal: generation, storage and Composition of refuse, quantity, house treatment, Administration of collection and disposal. Socio economic and cultural aspect associated with refuse management problem.

House sanitation: importance of house sanitation, indoor pollution, importance of sun light, Heating, cooling, ventilation, air conditioning, lighting. Noise-hazards of noise, protection against noise, fly and mosquito control. Architectural aspects for house sanitation.

Communicable Disease: Disease and immunity, communicable, diseases source, Mode of transfer, Control of communicable diseases

Sanitation of public places: Problems of sanitation of the following public places and their solutions : Swimming pools and bathing places, Bus and railway station, Hospitals, Cinema houses, Campus, fairs and festival.
Milk Food Sanitation: Essentials of dairy farm and cattle shed sanitation. Tests for milk and dairy products. Food epidemics, food poisoning, Botulism.

Parasitology: Tropical health, Health problems of under develop countries. Disease due to parasite infestation. Physiological effects, specific examples of region. Engineering control.

Term work: Ten assignments based upon above syllabus as on following topics:

a. Importance of environmental sanitation and historical back ground (one assignment)
b. Traditional Indian practices for environmental sanitation and health protection. (one assignment)
c. Refuse problem and its cultural aspects (two assignment)
d. Refuse collection and socio economic aspects.(two assignment)
e. Disease transmission and its prevention, role of individual and community (two assignments)
f. Sanitation of public places (two assignment)

In addition to above, students must do a minor project based upon above syllabus the project must be a case study of field.

Books:-

1. Municipal & Rural Sanitation:- Ehlens &Steel
2. Environmental Management:- G.N. Pandey
3. Environmental Sanitation:- B.S. Kapoor

2. REMOTE SENSING, GIS AND ITS ENVIRONMENTAL APPLICATIONS

Lectures – 03 Hours / Week	Theory 100 marks
Tutorial - 01Hours/week	min passing 40 marks
term work 50 marks	Duration - 03Hours

Fundamental principals of remote sensing, electromagnetic energy and its atmospheric interactions, remote sensing systems.

Elements of remote sensing systems, Indian remote sensing program.

Principles of Ariel survey, ariel photography, scale, types of photographs, over lapping, drift and drag, air photo interpretation, equation of parallex, stereoscopic vision, air base distance, areil points.

Satellite imageries, stationary and geo-stationary satellites, global positioning system and its application in environmental engineering. Indian satellite program.

Geographical information system, fundamentals, applications, characteristics. Different types of sensors, data interpretation.

Integrated application of remote sensing and GIS in environmental engineering, resource management, monitoring and evaluation, modeling.

Term work:

1. Practice with GIS software.
2. Minor project using GIS
3. Study of areil photographs and satellite imageries.
4. Five assignments based upon above syllabus. The assignments should include following topics:
    a. Principles of remote sensing (one assignments)
    b. GIS, its scope and applications (Two assignments).
    c. History and development of GIS (one assignment)
    d. Digital data interpretation (one assignment).

Books:

1. Remote sensing, principles and interpretation by W H & Freeman & Co. NY.
2. Remote sensing by Gupta R P.
3. Introductory digital image processories by Jensen J R, Pentice Hall, NZ.

3. Rural Water Supply and Sanitation

Lectures – 03 Hours / Week
Tutorial - 01Hours/week
term work 50 marks

Theory 100 marks
min passing 40 marks
Duration - 03Hours

Importance of village community in India , conditions of Indian villages with special regard to economic ,social and health aspect. Quality of water needed for village community. Sources of water for village water supplies. Types of wells of sanitary aspects in well construction. Disinfections of wells. Different types of pumps used for village wells. Treatment of water. Hydrological aspects of source and its impact on water quality. Strengthening of source.

Engineering project and role of engineer. Steps in project development report. Feasibility of the project both technical and financial. Alternative project construction. Cost comparison, scientific management and relationship , Rationalization, Qualities of good manager , office organization. Organization and management of stores. Present worth annuities, sinking funds, capitalized cost, annual expense, depreciation salvage value Rate structure, sources of money. General principles of financing, capital improvements and operating water works. Benefit cost ratio analysis, life of scheme, history, development and management of water supply and sanitary engineering projects in India.

Design of rural water supply scheme. Cost estimation of rural water supply scheme.

Term work: Five assignments based upon above-mentioned syllabus. The above assignments shall include following topics:

a. Importance, history and economic aspect of rural water supply in India. Five year development plans (one assignment).
b. Project management techniques applied to rural water supply engineering (two assignments)
c. Automation of small water supply schemes and limitation (two assignments)

In addition to above, the candidate must do a minor project based upon rural water supply schemes. It may be a case study or a design.

Books:-

1. Water supply Engineering:- S.K. Garg
2. Management of water projects:- Oxford &IBH publishing Co.
3. Pumping and Collection of water by MetCalf and Eddy TMC publications.

Laboratory Practice I

All assignments are compulsory

1. Assignment No I – Environmental Engineering Microbiology
2. Assignment No 2 – Design operation and maintenance of water supply and sewerage system
3. Assignment No 3 – Air pollution
4. Assignment No 4 – Elective I

Experiment (Minimum Four)

1. Determination of Microbial quality of water by standard Plate count
2. Determination of coli form density by MPN method
3. Membrane Filter Test
4. Determination of NO_x/SO_x
5. Determination of chloride content
6. Determination of C O D
7. Determination of Oil and Grease

ME Civil Engineering (Environmental Engineering)

TERM II

1. ADVANCED WATER TREATMENT TECHNOLOGY

Lectures – 03 Hours / Week
Tutorial - 01Hours/week
term work 50 marks

Theory 100 marks
min passing 40 marks
Duration - 03Hours

Quality of water: Standards of raw and treated waters. Sources of water and their natural quality. Protection of sources. Effects of water quality. Water ecology, water demand, fluctuation, water supplies.

Water treatment: Requirements of water treatment facilities. Process design and hydraulic design.
Unit operations and process, kinetic theory of reactors, plug flow and completely mixed reactor, dye tracing, efficiency of reactors, reactors in series, partially mixed reactors.
Sedimentation and flotation: General equation for settling or rising of discrete particles. Hindered settling. Effect of temperature, viscosity. Efficiency of an ideal settling basin, Reduction in efficiency due to various causes. Sludge, Storage and removal. Design criteria of settling tanks.

Coagulation: theories of chemical coagulation, coagulation aids. Mixing arrangement design of mechanical flocculator. Mean velocity gradient, effect of temperature.

Filtration: Theory of filtration. Size & shape characteristics of filter media. Preparation of filter sand. Hydraulics of filtration through homogenous and stratified media. Hydraulics of filter washing. Design of filter elements. Filter appurtenances, multimedia filters.

Disinfection: importance of disinfections, Methods of disinfections. Factors affecting disinfections. Destruction of bacteria, virus. Methods of dosing. Safety measures. Bad effect of chlorination.

Aeration: Principles of aeration methods.

Softening of water: types of hardness, effects, permissible limits, Langelier index, Methods of softening.

Miscellaneous water purification processes: Removal of Iron and manganese, Removal of taste and odor. Removal of Fluorides. Treatment of saline water.

Corrosion: Theory and principles of corrosion, Factors influencing corrosion. Methods of protection.

Latest methods of water treatment.

Complete design of water treatment plant as per prevailing Indian standard codes of practice with cost estimation.

Term work:

1. Five assignments based upon above-mentioned syllabus. The assignments should include following topics:
    a. Design of primary settling tank with all components
    b. Design of secondary settling tank with all components
    c. Design of coagulation units with all components
    d. Design of Filtration unit with all components
    e. Design of disinfection unit with all components.

2. Visit to a water treatment plant and its report.
3. Complete design of water treatment plant with all details, drawings and cost estimation.

Books:-

1. Water supply and sanitary engineering: E W Steel.
2. Water treatment technology: Walter J Weber
3. Water treatment manual by CPHEEO

2. ADVANCED WASTEWATER TREATMENT TECHNOLOGY

Lectures – 03 Hours / Week
Tutorial - 01Hours/week
term work 50 marks

Theory 100 marks
min passing 40 marks
Duration - 03Hours

Sewage characteristics: Characteristics of domestic sewage, storm and combined sewage. Constituents of Sewage. Sampling and storage of sewage. Decomposition of organic materials. Biodegradability. Biochemical oxygen demand. BOD satisfaction rate constant. Population equivalent. Chemical oxygen demand.
Monod's equation for substrate utilization. Kinetic coefficients of microbial decomposition of wastewater under aerobic and anaerobic conditions. Determination of kinetic coefficients. Mathematic relationship between coefficients. Kinetic theory applied to aerobic and anaerobic suspended growth mixed biological reactor, Kinetic theory applied to aerobic and anaerobic attached growth biological reactor.

Sewage disposal: Disposal methods. Self Purification of natural bodies of water. Oxygen balance and oxygen sag. Critical time and critical distance, mathematical treatment. Sewage farming.

Sewage treatment: Object of sewage treatment. Process design and hydraulic design. Screening and Grit Removal: Design and operation of screens. Disposal of screening. Principles of sedimentation applied to grit chamber. Velocity control. Disposal of grit.

Oil and grease separation: Sedimentation Primary , intermediate and final clarification. Design of tanks. Removal of sludge and scum . Sedimentation aided by chemical. Principle and theory of biological methods of treatment. Design of facilities for biological treatment of wastewater, activated sludge process, trickling filters, anaerobic and aerobic lagoons, oxidation ditch, oxidation ponds, septic tanks.
Sludge production, removal, handling, disposal methods, bio gas generation, design of bio gas reactor, sludge drying beds and their design. Aerobic digesters.

Miscellaneous Treatment: Disinfections of sewage. Coagulation of sewage.
Non biodegradable organics, their occurrence, bad effects, conventional removal methods introduction to photocatalysis theory for non biodegradable organics.

Complete design of wastewater treatment plant with all components, details, drawings and cost estimation.

Term work:

1. Five assignments based upon above-mentioned syllabus. The assignmenst should include following topics:
    a. Design of preliminary treatment system.
    b. Design of primary treatment system.
    c. Design of Biological treatment system
    d. Design of tertiary treatment system
    e. Design of advance wastewater treatment methodology.
2. Visit to a wastewater treatment plant and visit report.
3. Complete design of wastewater treatment plant with all components, details, drawings and cost estimation.

Books:-

1. Wastewater treatment, disposal and reuse: Metcalf & Eddy Inc.
2. Wastewater treatment technology by S J Arceiwala.
3. Wastewater treatment system by Hammer.
4. Wastewater treatment manual by CPHEEO

3. INDUSTRIAL WATER AND WASTEWATER MANAGEMENT

Lectures – 03 Hours / Week
Tutorial - 01Hours/week
term work 50 marks

Theory 100 marks
min passing 40 marks
Duration - 03Hours

Special problems of Industrial wastewater, water quality index and its application for industrial wastewater recalculation and reuse, industrial ecology, integrated approach for industrial water and wastewater management.
Water requirements of various industries. General idea of manufacturing process in various industries. Sources of wastewaters.

Legal aspects of industrial wastewater management, Regulatory agencies, Standards for treatment.

Reuse and recovery of bye products from industrial wastewaters. Volume reduction and waste reduction approach for pollution control, concept of end of pipe and cleaner technology.
Combine effluent treatment plants, combined domestic and industrial wastewater treatment plants.
Acclimatization of bio mass for industrial wastewater treatment, addition of nutrients.
Case studies of various industries including textile industry, distilleries, sugar industry, paper and pulp mills, oil and petroleum, dairy, food processing industries.

Books:-

1. Liquid waste of industry- theory practice and treatment: Nelson J Nemerow
2. Industrial water pollution control: W W Eekenfelder
3. Industrial wastewater management by R Mahajan TMC publication
4. Manual of Industrial wastewater by NEERI

Term work:

Five assignments based upon above syllabus. The assignments shall include following topics:

a. Characteristics of wastewater of major industries in India.
b. Pollution impact of major industries on wet land and soil.
c. Integrated water and wastewater management of major industries.
d. Typical problems with wastewater treatment of major industries.
e. Advance treatment methodology for major industrial wastewaters.

In addition to above, students should visit to at least three industrial wastewater treatment plants and submit a report.

4. WATERSHED MANAGEMENT

Lectures – 03 Hours / Week
Tutorial - 01Hours/week
term work 50 marks

Theory 100 marks
min passing 40 marks
Duration - 03Hours

Introduction: scope, objectives significance.

Water in the atmosphere: global distribution and availability of water, precipitation and evaporation, factors affecting them.

Hydrology and water resources development: analysis of runoff and rain fall, storage and regulation of run off, safe yield of streams, estimation of storage requirements. Pollution monitoring in watershed and its control, watershed hygiene.

Hydrology of ground water: common aquifers, exploration of ground water, hydraulics of ground water, measurement of permeability. Design construction and maintenance of wells and infiltration galleries. Salt water infiltration and prevention, ground water recharge.

Watershed development and management: definitions, need, scope, characteristics of watershed criteria survey, basic data collection and interpretation, establishment of watershed resource evaluation and management. Urban watershed management strategy and its necessity in present time. Town planning aspect for watershed management.

Irrigation technology: integrated farming system, prospects of watershed management, methodology for modifying water resource environment, watershed management and large scale changes.

Practice of watershed management: rehabilitation, protection and enhancement.

Rain water harvesting: necessity, methods of rainwater harvesting, community participation, role of NGOs, municipal corporation, Government. Limitations. Quality assurance of storage water. Traditional water harvesting techniques and their relevance.

Design of structures for watershed management including small bandhara, percolation tanks, minor dam.

Term work: Seven assignments based upon above-mentioned syllabus. Site visit to an existing rainwater harvesting site. The assignments should be based upon following topics:

a. Water in the atmosphere
b. Hydrology and water resources development
c. Hydrology of ground water
d. Watershed development and management
e. Irrigation technology
f. Practice of watershed management
g. Rain water harvesting
h. Design of structures for watershed management

In addition to above the candidate should do a case study or design of a watershed management scheme.

Books:

1. Watershed hydrology: Peter E Black.
2. Water resources systems: planning and management: R N Chaturvedi.
3. Watershed Management strategy by S P Shah TM C publication.

ME Civil Engineering (Environmental Engineering)

ELLECTIVE II

1 DESIGN OF WATER SUPPLY AND WASTEWATER STRUCTURES.

Lectures – 03 Hours / Week
Tutorial - 01Hours/week
term work 50 marks

Theory 100 marks
min passing 40 marks
Duration - 03Hours

Introduction to IS codes for practice for steel and concrete tanks and pipes.

Conduits: Stresses in pipes, strength of conduits, Design of concrete and steel pipe for internal and external loads. Anchor blocks.

Tanks: Design of various types of underground tanks, safety analysis, retaining wall and floor junction. Surface resting rectangular and circular tanks in R.C.C. and steel. Over head rectangular and circular tanks in R.C.C. and steel. Intze tanks. Steel and concrete staging.

Treatment Units: Design clarifiers, flocculators, filter house, Hopper bottom tanks. Digesters.

Books:

1. Design of steel structures:- S. Ramamurtham
2. Design of concrete structures: S Ramamrtham
3. Design of concrete structures: Syal and Goel

Term work:

1. Design and detailing with drawings of circular water tank on surface.
2. Design and detailing with drawings of rectangular water tank on surface.
3. Design and detailing with drawings of bracings for overhead water tank.
4. Design and detailing with drawings of Intze type water tank.
5. Design and detailing with drawings of rectangular water tank under ground.
6. Design and detailing with drawings of flocculation unit.
7. Design and detailing with drawings of filtration unit.

Any five assignments of above.

2 ENVIRONMENTAL IMPACT ASSESMENT

Lectures – 03 Hours / Week
Tutorial - 01Hours/week
term work 50 marks

Theory 100 marks
min passing 40 marks
Duration - 03Hours

Development and environment, need for environmental impact assessment, concept of EIA, elements of EIA, environmental attributes, nature of impacts- primary, secondary, tertiary, short term and long term, local and regional, reversible and irreversible impacts.

Overview of impacts- directly and indirectly measurable impacts with respect to air, noise, water, land, biological and socio economic environment.

Screening and scooping in EIA: terms of reference for conducting EIA, methodologies of EIA- check list, matrices, overlays, cost benefit analysis adaptive environment and management network.

Frame work of EIA: scope of EIA, base line data collection, prediction of impacts, evaluation of impacts, Battelle environmental evaluation system, environmental management plan, green belt development, environmental quality monitoring, budgetary provisions for implementing control measures.

Environmental appraisal of project, MOEF questionnaire for environmental clearance, elements of public participation and hearing, case study on EIA of industrial, mining, highway and water resources projects, critical environmental issues and formulation of strategies for EMP for this project.

Environmental legislation- basic concepts, critical issues, civil liabilities, various enactments and their provisions- water act (1974, 1978), forest conservation act (1980), air pollution control act (1981, 1988), water (cess) act 1977, environmental protection act 1986, public liability and insurance act.

Environmental audit- definition, concept of EA, types of environmental audits, benefits of EA, scope and objectives, environmental statement, procedural aspects of conducting EA pre-audit phase, onsite audit phase and post audit phase, water audit,

energy audit, raw material audit and health & safety audit. Conservation of energy and water, waste minimization, economic benefits of EA.

Sustainable development and environmental management: concept of carrying capacity, assimilative and supportive capacity, carrying capacity based developmental planning process, regional EIA and preparation of regional EMP, , development of action plan for critical environmental areas, training needs in EM and Environmental Educational Programs. Environmental management in India.

Resource management: types of resources, terrestrial (soil) resource, mineral plants and animal (biotic) resources, marine fresh water, air and bio energy resources, resource utilization, renewable and non-renewable resources. Optimal use of resources. Depletion of resources, causes and effects.

Human resources: importance of socio economic studies in development projects.

Books:

1. Environmental Impact Assessment by Rau and Woofes.
2. Environmental Impact Assessment by W F Canter, TMC publication.
3. Hand books of pollution control act, central pollution control board, New Delhi.
4. The new environmental age by R K Sapra, S Bhardwaj, Ashish publication house New Delhi.

Term Work:

Five assignments based upon above syllabus. Assignments shall include following topics:

1. Development and environment
2. Overview of impacts
3. Frame work of EIA:
4. Environmental appraisal of project
5. Environmental legislation

In addition to this the candidate must do a minor project of EIA of any industry or any other development project.

3. SOLID WASTE AND MANAGEMENT

Lectures – 03 Hours / Week
Tutorial - 01Hours/week
term work 50 marks

Theory 100 marks
min passing 40 marks
Duration - 03Hours

General: Importance of solid waste, historical background. Over view of solid waste management

Generation of solid waste, quantity of solid waste, sampling of solid waste, characterization of solid waste, characteristics of solid waste, three phase diagram.

Storage systems, multi-bin storage system, levying on solid waste weight, climatic factors, cultural factors, removal of solid waste.

Transportation of solid waste, route optimization, numericals on route optimization and optimum number of transportation facility..

Recovery and reuse of solid waste, waste minimization. Numericals on chemical characteristics of SW.

Disposal methods of solid waste: land filling site selection, advantages and disadvantages of land filling, leachets control, fly and mosquito control at land fill side.

Composting of solid waste, Indore and Banglore methods, future of composting, limitations of composting method.

Vermicomposting: introduction and significance.

Incineration of solid waste: application, design of incinerator.

Dumping of solid waste in sea, grinding and dumping into sewers, hog feeding.

Hazardous wastes.

Socio economic and cultural aspects in solid waste management.

Management of thermal power plant waste, reuse of flyash, economic considerations.

Biomedical waste management, safety precautions, standards, disposal methods.

Term work: ten assignments based upon above syllabus. Visit to a solid waste site.

Books:-

1. Handbook of solid waste management:- Frank Kreith
2. Management of solid waste in developing countries:- Frank Flintoff
3. Solid waste management:- D. Joseph Hagerty, Joseph L.Pavoni

Laboratory Practice II

All assignments are compulsory

1. Assignment No I – Advanced Water Treatment Technology
2. Assignment No 2 – Advanced Waste Water treatment Technology
3. Assignment No 3 – Industrial water and waste water Management
4. Assignment No 4 – Water shed management
5. Assignment No 5- Elective II

Experiments (Minimum Three)

1. Estimation of Hardness
2. Estimation of Ammonia/Nitrogen
3. Estimation of Phosphate
4. Estimation of Heavy metal
5. Estimation of pesticide residue

North Maharashtra University

CIVIL ENGINEERING DEPARTMENT

MASTERS OF ENGINEERING

CIVIL ENGINEERING

(ENIVIRONMENT ENGINEERING)

With effect from Academic year 2010 -2011

North Maharashtra University, Jalgaon
M.E. (Computer Science and Engineering)
Syllabus with effect from Year 2009-10
First Year Term I

Sr. No.	Subject	Teaching Scheme per Week		Examination Scheme				
		L	P	Paper Hr.	Paper	TW	PR	OR
1	Advanced Software Engineering	3	-	3	100	-	-	-
2	Distributed Systems	3	-	3	100	-	-	-
3	Net-Centric Computing	3	-	3	100	-	-	-
4	Applied Algorithms	3	-	3	100	-	-	-
5	Elective- I	3	-	3	100	-	-	-
6	Laboratory Practice-I	-	6	-	-	100	-	50
7	Seminar-I	-	4	-	-	100	-	-
	Total	15	10		500	200		50
	Grand Total	**25**		**750**				

Elective I

1) Embedded Software Design
2) Digital Image & Video Processing
3) Mathematical Foundations of Computer Science
4) Software Project Management

First Year Term II

Sr. No.	Subject	Teaching Scheme per Week		Examination Scheme				
		L	P	Paper Hr.	Paper	TW	PR	OR
1	Advanced Database Management Systems	3	-	3	100	-	-	-
2	Web Engineering	3	-	3	100	-	-	-
3	Parallel Computing	3	-	3	100	-	-	-
4	Soft Computing	3	-	3	100	-	-	-
5	Elective- II	3	-	3	100	-	-	-
6	Laboratory Practice-II	-	6	-	-	100	-	50
7	Seminar-II	-	4	-	-	100	-	-
	Total	15	10		500	200		50
	Grand Total	**25**		**750**				

Elective II

1) Software Testing And Quality Assurance
2) Cryptography and Network Security
3) Pattern Recognition
4) Mobile Computing

Second Year Term I

Sr. No.	Subject	Teaching Scheme per Week		Examination Scheme				
		L	P	Paper Hr.	Paper	TW	PR	OR
1	Seminar-III	-	4	-	-	50	-	50
2	Project Stage –I	-	18	-	-	100	-	-
	Total	-	22	-	-	150		50
	Grand Total	**22**		**200**				

Second Year Term II

Sr. No.	Subject	Teaching Scheme per Week		Examination Scheme				
		L	P	Paper Hr.	Paper	TW	PR	OR
1	Progress Seminar	-	-	-	-	50	-	-
2	Project Stage –II	-	18	-	-	150	-	100
	Total	-	18	-	-	200	-	100
	Grand Total	**18**		**300**				

Rules and Regulations for M.E. in Computer Science & Engineering

1. The post graduate degree in engineering consisting of 2 years (4 terms) shall be designated as Master of Engineering in Computer Science & Engineering.

2. A candidate may be permitted to register him/her self for the M.E. degree in Computer Science and Engineering under the faculty of engineering & technology of North Maharashtra University Jalgaon ,only if the candidate holds a bachelor's degree in Engineering & technology of North Maharashtra University , Jalgaon or its equivalent in Computer Engineering / Computer Science & Engineering / Computer Technology /Information Technology/ Electronics/ Electronics and Telecommunication /Electrical recognized by AICTE & North Maharashtra University , Jalgaon.

3. The student shall be admitted to First Year Term II if his/her Term I is granted.

4. The student shall be admitted to the Second Year when ever he/she clears all the theory papers of First Year. The student in any case should not be allowed to start project work before passing all the subjects of first year. The student will have to work on his/her project for minimum one year after passing first year subjects. He/she will not be allowed to submit his/her thesis/dissertation before that.

5. Every student will be required to produce a record of laboratory work in the form of journal, duly certified for satisfactory completion of the term work by the concerned teacher & head of the department.

6. A student whose term is not granted on account of less attendance (Minimum 80%) or non-submission of term work is required to repeat the term.

7. Any approved guide will not be allowed guide more than 5 students in a particular batch.

8. Each student is required to present Seminar-I in the First Year Term I on any related state of the art topic of his own choice approved by the department.

9. The term-work & presentation of the Seminar-I will be evaluated by departmental committee consisting of guide and two faculty members of the department appointed by Director/Principal of the college as per the recommendation of the Head of the Department.

10. Each student is required to present Seminar-II in the First Year Term II on any related state of the art topic of his own choice approved by the department.

11. The term-work & presentation of the Seminar-II will be evaluated by departmental committee consisting of guide and two faculty members of the department appointed by Director/Principal of the college as per the recommendation of the Head of the Department.

12. Each student is required to present Seminar-III in the Second Year Term I on special topic. The topic should be on any of the area not included in the regular curriculum. The report should include detailed study of specific concept (i.e. analysis, design & implementation.). This can be a theoretical study or practical implementation approved by the department/guide.

13. Guidelines for the Seminar-III in Second Year Term I:

1. Seminar-III should be conducted at the end of Second Year Term I.
2. The term-work of the Seminar-III will be evaluated by departmental committee consisting of guide and two faculty members of the department appointed by Director/Principal of the college as per the recommendation of the Head of the Department.
3. The Seminar-III presentation will be evaluated by examiners appointed by University, one of which should be the guide.
4. Student must submit the Seminar Report in the form of soft bound copy
5. The marks of Seminar-III should be submitted at the end of Second Year Term I to the University.

14. Guidelines for the Progress Seminar in Second Year Term II:

- Progress Seminar should be conducted in the middle of Second Year Term II.
- The Progress Seminar Term-Work will be evaluated by departmental committee consisting of guide and two faculty members of the department appointed by Director/Principal of the college as per the recommendation of the Head of the Department.
- Student must submit the progress report in the form of soft bound copy.
- The marks of progress seminar should be submitted along with the marks of Project Stage-II.

15. Minimum passing marks for all Theory shall be 40% and for Term work and Oral shall be 50%.

16.He/she has to present/publish atleast one paper in reputed National/International Journal/Conference on his/her Project work before submission of his/her Thesis/Dissertation.

17. The Term Work of Project Stage –II will be assessed jointly by the pair of Internal and External examiner along with oral examination of the same.

18. The class will be awarded on the basis of aggregate marks of all four terms, giving equal weightage to all terms as shown below:

a) Less than 50%	: Fail
b) 50% to less than 60%	: Second Class
a) 60% to less than 70%	: First Class
b) 70% & above	: First Class with Distinction.

19. Each student is required to complete his/her master's degree within **Five** academic years from the date of admission, failing which he/she will be required to take fresh admission in first year.

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM I

SUBJECT: ADVANCED SOFTWARE ENGINEERING

Lectures: 3 Hrs per week	**Theory: 100 Marks**

Objective:
After successfully completing the module student should be apply the systematic approach towards the effective software development, also able to demonstrate knowledge of software design, development and processes using software engineering approaches and practices.

Pre-requisites:
Knowledge of Software Engineering.

DETAILED SYLLABUS

1. Introduction to Software Engineering: Software Engineering Processes, Project Management concept, Project Effort estimation, LOC and function point based estimates, Requirement Analysis and Specifications, Formal Requirements, Specifications, Socio-technical Systems, Dependability, Critical Systems Specification, Formal Specification. Analysis Modeling, Elements of Analysis Model.
2. Design Concepts and Principles: Fundamental issues in Software Design, Effective Modular Design, cohesion and coupling. Architectural Design, Distributed Systems Architecture, Application Architectures, Real-time Systems, User Interface Design, Component Level Design, Modeling Language(UML)
3. Software Development Methodologies: Iterative Software Development, Software Reuse, CBSE, Critical Systems Development Software Evolution. Verification and Validation, Software Testing, Software Testing Principles, Alternative Paradigms: Extreme Programming, Agile Software Engineering, Principles behind Agile method, Agile method and Project Management.
4. Object Oriented Software Engineering: Software Process Improvement, Software Economics, Software Quality, Software Metrics, Software Maintenance, Risk management, Requirement Engineering, Object oriented concepts and principles, OO Analysis, OO Design, OO Testing,
5. Advanced Software Engineering Process: Formal Methods, Basic concepts, Mathematical Preliminaries, Clean room Software Engineering, Component Based Software Engineering, Client/Server Software Engineering, Web Engineering, Reengineering

BOOKS

Text Books:

1. K.K Aggarwal & Yogesh Singh," Software Engineering", 3rd Edition, New Age International, 2007

References:

1. Ian Somerville,"Software Engineering", 8th Edition, Addison-Wesley,2006,
2. Roger S Pressman,"Software Engineering: A Practitioner's Approach" 6th Edition, McGraw Hill,2005.
3. Fenton and Pfleeger "Software Metrics:- A Rigorous and Practical Approach" , 2nd Edition , Tomson Learning
4. Grady Booch, Rumbaugh, Jacoboson,"Unified Modeling Language User Guide", Addison Wesley.

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM I

SUBJECT: Distributed Systems

Lectures: 3 Hrs per week	**Theory: 100 Marks**

Objective:
This course aims to build concepts regarding the fundamental principles of distributed systems. The design issues and distributed operating system concepts are covered.

Pre-requisites: Operating Systems and Computer Networks

DETAILED SYLLABUS

1. INTRODUCTION: Definition of a Distributed system, Goal, Types of distributed system

2 .ARCHITECTURES : Architectural styles, System Architectures, Architectures versus Middleware, Self management in distributed systems

3. PROCESSES: Threads, Virtualization, Clients, Servers, Code migration.

4 .COMMUNICATION: Fundamentals, Remote Procedure Call, Message Oriented Communication, Stream oriented communication, Multicast communication.

5. NAMING: Names, Identifiers and Addresses, Flat, Naming, Structured Naming, Attribute based Naming, LDAP

6. SYNCHRONIZATION: Clock Synchronization, Logical Clocks, Mutual Exclusion Global Positioning of nodes, Election Algorithms.

7. CONSISTENCY AND REPLICATION: Introductions, Data Centric Consistency Models, Client Centric Consistency Models, Replica Management, Consistency Protocols.

8. FAULT TOLERANCE: Introduction to fault tolerance, Process resilience, Reliable Client Server Communication, Reliable group, Recovery

9. DISTRIBUTED FILE SYSTEMS: Architecture, Process Communication, Naming, Synchronization, Consistency and Replication, Fault tolerance, Security.

10 DISTRIBUTED COORDINATION-BASED SYSTEMS: Introduction to coordination models- Architectures, Processes communication, Synchronization, Consistency and Replication, Fault tolerance, Security.

BOOKS

Text Books:

1. Andrew S. Tanenbaum, Maarten Van Steen, "Distributed System: Principals and Paradigms", 2/E, PHI.

References:

1. George Coulouris, Jean Dollimore and Tim Kindberg,"Distributed Systems Concepts and Design", Fourth Edition, Pearson Education, 2005**.**
2. Pradeep K. Sinha, "Distributed Operating Systems Concepts and Design" , PHI.
3. Galli D.L., "Distributed Operating Systems: Concepts and Practice", Prentice-Hall,2000

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM I

SUBJECT: NET-CENTRIC COMPUTING

Lectures: 3 Hrs per week	**Theory: 100 Marks**

Objective:
After successfully completing the module student should be :
Familiar with different network technologies, Different Network performance, Modeling and estimation measures, Function and responsibilities of Network Administration, Different Network Design Techniques, Knowledge of High Speed Network, Issues regarding Network Security, Knowledge of IP Telephony, Storage Network and Compression Techniques.

Pre-requisites:
Knowledge of Data Communication and Computer Networks.

DETAILED SYLLABUS

1. Network Technology :
   Introduction, Media Issues, Data Link Protocols, The OSI Model, Networking topologies, Types of Networks, protocols capabilities, NetBIOS, IPX,TCP/IP,CSMA/CD, token passing, frame relay, networking devices, Repeaters, Bridges, Routers, switches, gateways, Network design issues, Data in support of Network Design, Network design tools, protocols and architecture.
2. Network Performance, Modeling and Estimation :
   Issues related with optimizing network performance, probability, stochastic processes, modeling and performance evaluation. Queuing theory, queuing models, estimating model parameters, throughput utilization, modeling network as graph external and internal representation, complexity issues, network traffic controls.
3. Network Administration :
   Function and responsibilities, network issues:-planning, implementation, fault diagnosis and recovery.
4. Network Design :
   Problem definition, multipoint line layout heuristics, CMST algorithms, ESAU-William's algorithm, Sharma's algorithm, unified algorithm, Bin packing algorithm, Terminal assignments and concentrator location.
5. High Speed Networks :
   Need, characteristics, challenges, applications, frame relay, ATM, ISDN, High speed LANs: Ethernet, fiber channel, DQDB, SMDS, B_ISDN, STM, DSL, and DWDM, Architecture Transport, Switching and Routing in optical domain, optical network management, Internetworking.
6. Network security :
   Basic cryptographic techniques, security in OSI architecture, internet and networked computing, Kerberos, firewalls, proxy, etc. Security applications in commerce and banking.
7. IP Telephony :
   VOIP system architecture, protocol hierarchy, structure of a voice endpoint,

Protocols for the transport of voice media over IP networks, Providing IP quality of service for voice, signaling protocols for VOIP,PSTN gateways, VOIP applications.

8. Storage Networks :
   Introduction, challenges, SCSI protocols and architecture: RAID, Backup and mirroring, Fiber channel attached storage. Network attached storage including NFS, CIFS, and DAFS, Management of network storage architectures. New storage protocols, architectures and enabling technologies.
9. Compression :
   Overview of Information Theory, Lossless Compression: Run-Length Encoding, Facsimile compression, String Matching algorithms. Lossy compression: DCT, Wavelet compression.

BOOKS

References:

1. Stallings. W.-"High Speed Networks and Internets: Performance and Quality of service",Pretice Hall 2002
2. Kershenbaum A.-"Telecommunications Network Design Algorithms" Tata McGraw Hill.
3. Ramaswami R. ,Shivrajan K-"Optical Networks", Morgan Kaufmann.
4. Douskalis B.-"IP Telephony: The Integration of Robust VOIP service",Perason Education Asia.
5. Douglas E.Comer-"Computer NetWorks and Internet", Pearson Education Asia.
6. Stallings W.-"High Speed Networks :TCP/IP and ATM Design principles", Prentice Hall,1998.
7. Andrew Tanenbaum- "Computer Network", PHI.

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM I

SUBJECT: APPLIED ALGORITHMS

Lectures: 3 Hrs per week	**Theory: 100 Marks**

Objective:
Algorithm design and analysis is a fundamental and important part of computer science. This course introduces students to advanced techniques for the design and analysis of algorithms, and explores a variety of applications.

Pre-requisites:
Knowledge of Algorithms, Discrete structure and graph theory.

DETAILED SYLLABUS

1. **Introduction**: The role of algorithms in computing, analyzing algorithms, designing algorithms, growth of functions- asymptotic notation,standard notations and common functions, recurrences- the substitution method, the recursion tree method, the master method.
2. **Advanced data structures** Red - black trees- properties of red-black trees, rotations, insertion, deletion, B-trees-definition of B-Tree, basic operations on B-Tree, deleting a key from B-Tree, Binomial heaps- binolial trees and binomial heaps, operations on binomial heaps, Fibonacci heaps- structure of Fibonacci heaps, mergeable heap operations, decreasing a key and deleting a node, bounding the maximum degree.
3. **Advanced Design and Analysis Techniques** Dynamic Programming- assembly line scheduling, matrix chain multiplication, elements of dynamic programming, longest common subsequence, optimal binary search trees, Greedy Algorithms- an activity selection problem, elements of greedy strategy, Huffman codes, Amortized Analysis- aggregate analysis, the accounting method, the potential method.
4. **Graph algorithms** Minimum Spanning Trees- growing a minimum spanning tree, the algorithms of Kruskal and Prim, Single-source shortest paths- the Bellman-Ford algorithm, Single-source shortest path in directed acyclic graphs, Dijkstra's algorithm, all pair shortest paths- shortest path and matrix multiplication, the Floyd-Warshall algorithm, Johnson's algorithm for sparse graphs.
5. **Sorting networks** Comparision networks, the zero-one principle, a bitonic sorting networks, a merging network, a sorting network

BOOKS

Text Books:

1. Corman, Leiserson, Rivest, Stein,"Introduction To Algorithms", PHI, 2nd Edition.
2. Horowitz, Sahni, Rajasekaran,"Fundamentals of Computer Algorithms", Universities Press, 2nd Edition.

References:

1. Aho,"Design and Analysis of Algorithms", Pearson, LPE
2. A V Aho, J. D. Ullman, "Design and analysis of algorithms", Pearson LPE.
3. Bressard, Bratly, "Fundamentals of Algorithms", Pearson LPE/PHI

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM I

SUBJECT: EMBEDDED SOFTWARE DESIGN
(ELECTIVE-I)

Lectures: 3 Hrs per week	**Theory: 100 Marks**

Objective:

After successfully completing the module student should be :
Capable of actively participating or successfully managing a embedded software development project by applying design life cycle concepts, able to demonstrate knowledge of real time constraint with concepts of RTOS as well as porting of any RTOS

Pre-requisites:

Knowledge of Microprocessors and Microcontrollers and their interfacing

DETAILED SYLLABUS

1. Embedded Design Life Cycle: Introduction Product Specification ,Hardware/Software partitioning , Iteration and Implementation, Detailed hardware and software Design, Hardware/Software Integration ,Product Testing and Release, Maintaining and upgrading existing products.

2. Selection Process & Development Environment: RTOS availability, Tool Chain availability, The Execution Environment, On chip Peripherals ,Debugging & Testing : BDM, JTAG, NEXUS & ICE
3. Advanced Embedded Processors: ARM Embedded Systems, ARM Processor Fundamentals, Introduction to the ARM ,Instruction Set, Introduction to the Thumb Instruction Set ,Efficient C Programming Writing and Optimizing ARM Assembly Code, Digital Signal Processing, Exception and Interrupt Handling, Firmware
4. Writing Software for Embedded Systems: The Compilation Process, Native Vs Cross-Compilers, and Runtime Libraries, Writing a Library, Using Alternative Libraries, using a standard library, porting Kernels extensions for embedded systems, Downloading, Emulation and Debugging techniques.
5. RTOS - µC/OS-II: RTOS Services in Contrast to Traditional O.S. Sample Code, Real-Time Systems Concepts, Kernel Structure, Task Management, Time Management, Inter task Communication and Synchronization, , Memory Management, Porting µC/OS -II
6. Understanding Linux Kernel: Introduction, Memory Addressing , Processes , Interrupts and Exceptions, Timing Measurements, Memory Management, Process Address Space, System Calls ,Signals, Process Scheduling, Kernel Synchronization, The Virtual File system, Managing I/O Devices , Disk Caches , Accessing Regular Files, Swapping: Methods for Freeing Memory, The Ext2 Files system, Process Communication , Program Execution, Porting of Linux Kernel
7. Understanding Windows Embedded CE Kernel: Introduction to Windows Embedded CE Kernel , Boot process, Memory Management, Files Database and Registry, Process and Threads, Communications , Porting of Linux Kernel

BOOKS

Text Books:

1. Embedded Systems Design – Introduction to Processes, Tools, Techniques, Arnold S Burger, CMP books
2. Embedded Systems Design by Steave Heath, Newnes.
3. "ARM Systems Developers Guide Designing and Optimizing System Software" By Andrew N Sloss, Dominic Symes & Cheris Wright ELSEVIER Publication.
4. Understanding the Linux Kernel Daniel P. Bovet Marco Cesati Publisher: O'Reilly First Edition October 2000 ISBN: 0-596-00002-2, 702 pages
5. Building Embedded Linux Systems by Karim Yaghmour
6. Inside Microsoft Windows CE By John Murray

References:

1. ARM System on chip architecture by Steve Furbur
2. µC/OS-II by Jean Labrossewww.uCOS-II.com
3. Programming Microsoft Windows Embedded CE

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM I

SUBJECT: DIGITAL IMAGE and VIDEO PROCESSING (ELECTIVE-I)

Lectures: 3 Hrs per week	**Theory: 100 Marks**

Objective: Digital Image Processing is a rapidly evolving field with growing applications in science and engineering. Image processing holds the possibility of developing the ultimate machine that could perform the visual functions of all living beings. There is an abundance of image processing applications that can serve mankind with the available and anticipated technology in the near future.

Pre-requisites: Digital Signal Processing, & Computer Graphics

DETAILED SYLLABUS

1. **Digital Image Processing Systems:** Introduction, Structure of human eye, Image formation in the human eye, Brightness adaptation and discrimination, Image sensing and acquisition, Storage, Processing, Communication, Display. Image sampling and quantization, Basic relationships between pixels
2. **Image Transforms (Implementation):** Introduction to Fourier transform, DFT and 2-D DFT, Properties of 2-D DFT, FFT, IFFT, Walsh transform, Hadamard transform, Discrete cosine transform, Slant transform, Optimum transform: Karhunen - Loeve (Hotelling) transform.
3. **Image Enhancement in the Spatial Domain:** Gray level transformations, Histogram processing, Arithmetic and logic operations, Spatial filtering: Introduction, Smoothing and sharpening filters
4. **Image Enhancement in the Frequency Domain:** Frequency domain filters: Smoothing and Sharpening filters, Homomorphic filtering
5. **Wavelets and Multiresolution Processing:** Image pyramids, Subband coding, Haar transform, Series expansion, Scaling functions, Wavelet functions, Discrete wavelet transforms in one dimensions, Fast wavelet transform, Wavelet transforms in two dimensions
6. **Image Data Compression:** Fundamentals, Redundancies: Coding, Interpixel, Psycho-visual, Fidelity criteria, Image compression models, Error free compression, Lossy compression, Image compression standards: Binary image and Continuous tone still image compression standards, Video compression standards.
7. **Morphological Image Processing:** Introduction, Dilation, Erosion, Opening, Closing, Hit-or-Miss transformation, Morphological algorithm operations on binary images, Morphological algorithm operations on gray-scale images
8. **Image Segmentation:** Detection of discontinuities, Edge linking and Boundary detection, Thresholding, Region based segmentation
9. **Image Representation and Description:** Representation schemes, Boundary descriptors, Regional descriptors
10. **Introduction to Video Processing:** Spatio-temporal sampling, inter frame and intraframe coding, motion estimation techniques, video compression standards.

BOOKS

Text Books:

1. R.C.Gonsales R.E.Woods**, "**Digital Image Processing", Second Edition, Pearson Education
2. Anil K.Jain, "Fundamentals of Image Processing", PHI
3. K. R rao and J.J. Hawang, "Techniques and Standards for Video and Audio Coding", Prentice Hall PTR

References:

1. William Pratt, "Digital Image Processing", John Wiley
2. Milan Sonka,Vaclav Hlavac, Roger Boyle, "Image Processing, Analysis, and Machine Vision" Thomson Learning
3. N Ahmed & K.R. Rao, "Orthogonal Transforms for Digital Signal Processing" Springer
4. B. Chanda, D. Dutta Majumder, "Digital Image Processing and Analysis", PHI.

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM I

SUBJECT: MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE (ELECTIVE-I)

Lectures: 3 Hrs per week	**Theory: 100 Marks**

Objective:
The purpose of this course is to develop mathematical foundations for computer science and computer engineering. In addition, applications of mathematical principles to computer science and engineering are presented.

Pre-requisites:
Knowledge of Theory of Computer Science, Discrete Structure and Graph Theory.

DETAILED SYLLABUS

1. Probability and Information Theory.
Introduction. Basic Concept of Probability. Properties. Basic Calculation. Random Variables and their Probability Distributions. Birthday Paradox. Information Theory. Redundancy in Natural Languages.

2. Computational Complexity.
Introduction. Turing Machines. Deterministic Polynomial Time. Probabilistic Polynomial Time. Non-deterministic Polynomial Time. Non-Polynomial Bounds. Polynomial-time Indistinguishability.

3. Algebraic Foundations.
Introduction. Groups. Rings and Fields. The Structure of Finite Fields. Group Constructed Using Points on an Elliptic Curve.

4. Number Theory.
Introduction. Congruences and Residue Classes. Euler's Phi Function. The Theorems of Fermat, Euler and Lagrange. Quadratic Residues. Square Roots Modulo Integer. Blum Integers.

5. Fuzzy Logic
Operations of fuzzy sets, fuzzy arithmetic & relations, fuzzy relations equations, MATLAB introduction, programming in MATLAB scripts, functions and their Applications
Case study: Development of fruit sorting system using fuzzy logic in MATLAB

BOOKS

Text Books:

1. Modern Cryptography: Theory and Practice by Wenbo Mao, Low Price Edition, Pearson Education

References:

1. Fuzzy logic in engineering by T. J. Ross, Willey Publications
2. Fuzzy sets theory and its applications, H.J. Zimmermann, Kluwer Academic Publications, 4th edition.
3. Elements of Discrete Mathematics, C.L.Liu, TMH, 2nd edition

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM I

SUBJECT: SOFTWARE PROJECT MANAGEMENT
(ELECTIVE-I)

Lectures: 3 Hrs per week	**Theory: 100 Marks**

Objective:

After successfully completing the module student should be :
Capable of actively participating or successfully managing a software development project by applying project management concepts, able to demonstrate knowledge of project management terms and techniques

Pre-requisites:

Knowledge of Software Engineering.

DETAILED SYLLABUS

1. Introduction to Project Management: Importance of software project management, stages and stakeholders of a software project, elements of software project, Importance of software project management, Stages of Project, The Stakeholder of Project, Project Management Framework, Software Tools for Project Management.
2. Project Planning: Integration Management, Scope Management, Stepwise Project Planning, Use of Software (Microsoft Project) to Assist in Project Planning Activities.
3. Project Scheduling: Time Management, Project Network Diagrams, Use of Software (Microsoft Project) to Assist in Project Scheduling.
4. Project Cost Management: Importance and Principles of Project Cost Management, Resource Planning, Cost Estimating, Cost Control, Use of Software (Microsoft Project) to assist in Cost Management.
5. Project Quality Management: Quality of Information Technology Projects, Stages of Software Quality Management, Quality Standards, Tools and Techniques For Quality Control.
6. Project Human Resources Management: Human Resources Management, Keys to Managing People, Organizational Planning, Issues in Project Staff Acquisition and Team Development, Using Software to Assist in Human Resource Management.
7. Project Communication Management: Communications Planning, Information Distribution, Performance Reporting, Administrative Closure, Suggestions for Improving Project Communications, Using Software to Assist in Project Communications.
8. Project Risk Management: The Importance of Project Risk Management, Common Sources of Risk in IT projects, Risk Identification, Risk Quantification, Risk Response Development and Control, Using Software to Assist in Project Risk Management.
9. Project Procurement Management: Importance of Project Procurement Management, Procurement Planning, Solicitation, Source Selection, Contract Administration, Contract Close-out.

10. Project Management Process Groups: Introduction to Project Management Process Groups, Project Initiation, Project Planning, Project Executing, Project Controlling and Configuration Management, Project Closing.

BOOKS

Text Books:

1.Kathy Schwalbe, "Information Technology Project Management", International Student Edition, THOMSON Course Technology
2.Bob Hughes and Mike Cotterell, "Software Project Management" Third Ed., Tata McGraw-Hill
3.Elaine Marmel, "Microsoft Office Project 2003 Bible", Wiley Publishing Inc.

References:

1.Basics of Software Project Management, NIIT, Prentice-Hall India
2.Pankaj Jalote, "Software Project Management in Practice", Pearson Education
3.S.A. Kelkar, "Software Project Management", A Concise Study, Revised Edition,PHI

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM I

SUBJECT: Laboratory Practice-I

Practical: 6 Hrs per week	**Term Work: 100 Marks** **Oral: 50 marks**

DETAILED SYLLABUS

Experiments/Assignments based on

1. Advanced Software Engineering
2. Net-Centric Computing
3. Elective- I

The concerned subject in-charge should frame minimum of six laboratory assignments, two from each subject.

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM I

SUBJECT: Seminar-I

Practical: 4 Hrs per week	**Term Work: 100 Marks**

DETAILED SYLLABUS

Seminar on related state of the art topic of student's own choice approved by the department.

TERM WORK

1.The term-work & presentation of the Seminar-I will be evaluated by departmental committee consisting of guide and two faculty members of the department appointed by Director/Principal of the college as per the recommendation of the Head of the Department.

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM II

SUBJECT: ADVANCED DATABASE MANAGEMENT SYSTEMS

Lectures: 3 Hrs per week	**Theory: 100 Marks**

Objective: The course gives an overview of motivation and background of the new developments, and is intended as an introduction to the most important advances with respect to the classical relational database systems.

Pre-requisites:
Knowledge of Database Management System, Operating System.

DETAILED SYLLABUS

1. **The Extended Entity Relationship Model and Object Model**
(a) The ER model revisited
(b) Motivation for complex data types
(c) User defined abstract data types and structured types
(d) Subclasses
(e) Superclasses
(f) Inheritance
(g) Specialization and generalization
(h) Relationship types of degree higher than two

2. **Object–Oriented Databases**
(a) Overview of object–oriented concepts
(b) Object identity
(c) Object structure and type constructors
(d) Encapsulation of operations
(e) Methods and persistence
(f) Type hierarchies and inheritance
(g) Type extents and persistent programming languages
(h) OODBMS architecture and storage issues
(i) Transactions and concurrency control
(j) Examples of ODBMS

3. **Object Relational and Extended Relational Databases**
(a) Database design for an ORDBMS
(b) Nested relations and collections
(c) Storage and access methods
(d) Query processing and optimization
(e) An overview of SQL3
(f) Implementation issues for extended type
(g) Systems comparison of RDBMS
(h) OODBMS
(i) ORDBMS

4. **Paralled and Distributed Databases and Client–Server Architecture**
(a) Architectures for parallel databases
(b) Parallel query evaluation
(c) Parallelizing individual operations
(d) Sorting Joins
(e) Distributed database concepts
(f) Data fragmentation
(g) Replication and allocation techniques for distributed database design
(h) Query processing in distributed databases
(i) Concurrency control and recovery in distributed databases
(j) An overview of client–server architecture

5**. Enhanced Data Models for Advanced Applications**
(a) Active database concepts
(b) Temporal database concepts
(c) Spatial databases: concept and architecture
(d) Deductive databases and query processing
(e) Mobile databases
(f) Geographic information systems

BOOKS

Text Books:

1.Elmsari and Navathe, Fundamentals of Database Systems
2.Ramakrishnan and Gehrke, Database Management Systems.

References:

1. Korth, Silberschatz, Sudarshan, Database System Concepts
2. Rob and Coronel, Database Systems: Design, Implementation and Management
3. Date and Longman, Introduction to Database Systems

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM II

SUBJECT: WEB ENGINEERING

Lectures: 3 Hrs per week	**Theory: 100 Marks**

Objective:
Provides an introduction to the discipline of Web Engineering. This course aims to introduce the methods and techniques used in Web-based system development. In contrast to traditional Software Engineering efforts, Web Engineering methods and techniques incorporate unique aspects of the problem domain such as: document oriented delivery, fine-grained lifecycles, user-centric development, client-server legacy system integration and diverse end user skill levels.

Pre-requisites:
Knowledge of both Internet communication concepts and an introductory programming knowledge (Java & Javascript).

DETAILED SYLLABUS

1. **An Introduction to Web Engineering:** Categories of Web Applications, Characteristics of Web
2. **Requirements Engineering for Web Applications:** Requirements, Engineering Activities, RE Specifics in Web Engineering, Principles for RE of Web, Adapting RE Methods to Web Application Development, Requirement Types.
3. **Modeling Web Applications:** Modeling Specifics in Web Engineering, Levels, Aspects, Phases,
4. Customization, Modeling Requirements, Content Modeling, Hypertext Modeling, Presentation Modeling, Customization Modeling, Methods and Tools.
5. **Web Application Architectures:** Fundamentals, Specifics of Web Application Architectures, Components of a Generic Web Application Architecture, Layered Architectures, Data-aspect Architectures.
6. **Technology-aware Web Application Design:** Web Design from an Evolutionary Perspective, Presentation Design, Interaction Design, Functional Design, Context-aware Applications, Device-independent Applications, Reusability.
7. **Technologies for Web Applications:** Client/Server Communication on the Web, Client-side Technologies, Document-specific Technologies, Server-side Technologies.
8. **Testing Web Applications:** Fundamentals, Test Specifics in Web Engineering, Test Approaches, Test Scheme, Test Methods and Techniques, Test Automation.
9. **Operation and Maintenance of Web Applications:** Challenges Following the Launch of a Web Application, Promoting a Web Application, Content Management, Usage Analysis, From Software Project Management to Web Project Management.
10. **Web Project Management:** Challenges in Web Project Management, Managing Web Teams, Managing the Development Process of a Web Application.

11. **The Web Application Development Process:** Requirements for a Web Application Development Process, Analysis of the Rational Unified Process, Analysis of Extreme Programming.
12. **Usability of Web Applications:** Design Guidelines, Web Usability Engineering Methods, Web Usability Engineering Trends.
13. **Performance of Web Applications:** System Definition and Indicators, Characterizing the Workload, Representing and Interpreting Results, Performance Optimization Methods.
14. **Security for Web Applications:** Aspects of Security, Encryption, Digital Signatures and Certificates, Secure Client/Server-Interaction, Client Security Issues, Service Provider Security Issues.
15. **The Semantic Web – The Network of Meanings in the Network of Documents:** Fundamentals of the Semantic Web, Technological Concepts, Specifics of Semantic Web Applications.

BOOKS

Text Books:

1. Gerti Kappel, Birgit Pr ¨ oll, Siegfried Reich, Werner Retschitzegger, "Web Engineering: The Discipline of Systematic Development of Web Applications", John Wiley
2. Pressman, Roger S. and Lowe, David, "Web Engineering: A Practioner's Approach",McGraw-Hill Higher Education

References:

1. Mishra, "Web Engineering And Applications", Macmillan Publishers India
2. Emilia Mendes, and Nile Mosley, "Web Engineering", Springer

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM II

SUBJECT: Parallel Computing

Lectures: 3 Hrs per week	**Theory: 100 Marks**

Objective:

Upon completion of this course students will be able to understand and employ the fundamental concepts and mechanisms which form the basis of the design of parallel computation models and algorithms, recognize problems and limitations to parallel systems, as well as possible solutions

Pre-requisites:

Computer architecture, Data structures.

DETAILED SYLLABUS

1.Introduction:
Need, Models of computation, SISD, MISD,SIMD-Shared Memory SIMD, Interconnection network SIMD, MIMD, Programming MIMD, Special Purpose Architecture, Analysis of algorithm, Running time, No of processors, Cost, Other Measures-Area, Length, Period, Expressing Algorithm.

2.Parallel processing:
parallel computer structure, designing of parallel algorithms, analyzing algorithms, general principles of parallel computing.

3. Parallel sorting algorithms
Batcher's bitonic sort, Bitonic sort using the perfect Shuffle, parallel bubble sort, Odd- even transpose sort, Tree sort.

4. Quick Sort:
Parallel Quick sort for CRCW PRAM, Parallel formulation for practical architectures,Shared Address space parallel formulation, message passing parallel formulation, pivot selection.

5. Sorting:
Sorting on the CRCW, CRFW, EREW models, searching a sorted sequence, CREW,CRCW & EREW searching, searching on a random sequence EREW, ERCW, CREW & CRCW searching on SIMD computers, searching on a Tree, mesh, A Network for merging, merging on the CRFW, ERFW models

6. Computing Fourier Transforms:
Computing the DFT in parallel, a parallel FFT algorithm.

BOOKS

References:

1. Design & Analysis of Parallel Algorithm by Salim & Akil, PHI.

2. Design Efficient Algorithm for Parallel Computers by Michel J. Quinn, TMH.

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM II

SUBJECT: SOFT COMPUTING

Lectures: 3 Hrs per week	**Theory: 100 Marks**

Objective:

By the end of the course a student is expected to become able to apply Genetic Algorithms, Fuzzy Logic and Artificial Neural Networks as computational tools to solve a variety of problems in their area of interest ranging from Optimization problems to Pattern recognition and control tasks.

Pre-requisites:

The prerequisite for this course is a basic understanding of problem solving, design and analysis of algorithms and computer programming. A prior course in Artificial Intelligence will be an advantage.

DETAILED SYLLABUS

1. Introduction to soft computing, Biological Neuron, Artificial Neuron, Characteristics of Neural Network, Neural Network Architectures, Learning in Neural Networks, Various learning Methods and Learning Rules, Single layer Perceptron, training and classification, Linear Separable classification, Applications of Neural Networks for Pattern Recognition, Classification and Clustering.
2. Introduction to Multilayer Perceptron, various activation functions, Delta and Generalized Delta Learning rule, Error Back Propagation training and algorithm, Counter Propagation Network, Boltzman Machine.
3. Recurrent Network, configuration, stability, Associative Memory: Concepts, performance analysis, BAM, ART.
4. Self-organizing Networks: Unsupervised Learning, Self-organized Map.
5. Introduction to fuzzy sets and fuzzy logic systems, Fuzzy set definitions, operations, Fuzzy rules, Fuzzy reasoning. Fuzzy inference systems, Fuzzy models.
6. Introduction to Genetic Algorithms, Biological Inspiration, The Genetic Algorithm, Genetic Operators, Genetic Algorithm through example, Sample problems, Genetic Algorithm Implementation, Tweaking the Parameters and Process, Various Problems with Genetic Algorithm.
7. Applications of Neural Network, Fuzzy Logic, Genetic Algorithms: Signal Processing, Image Processing, Pattern Recognitions, communication systems, Biological Sequence Alignment and Drug Design, Robotics and Sensors, Information Retrieval Systems, Share Market Analysis, Natural Language Processing.

BOOKS

Text Books:

1. J.M.Zurda, "Introduction to Artificial Neural Networks", Jaico Publishing House.
2. D. E. Goldberg, "Genetic Algorithms in Search and Optimization, and Machine Learning", Addison-Wesley, 1989.

3. Jang, Sun, & Mizutani, "Neuro-Fuzzy and Soft Computing", PHI.
4. M. Mitchell, "An Introduction to Genetic Algorithms", Prentice-Hall, 1998.

References:

1. S. Haykin, "Neural Networks", Pearson Education, 2nd Ed., 2001.
2. Klir & Yuan, "Fuzzy Sets and Fuzzy Logic", PHI, 1997.
3. Chin-Teng Lin & C. S. George Lee, "Neural Fuzzy Systems", Prentice Hall PTR.
4. S. Rajasekaran & G. A. V. Pai, "Neural Networks, Fuzzy logic, and Genetic Algorithms", PHI.
5. V. Kecman, "Learning and Soft Computing", MIT Press, 2001.
6. S. N. Sivanandam & S. N. Deepa, Principles of Soft Computing, Wiley - India, 2007
7. D. E. Goldberg, Genetic Algorithms in Search, Optimization, and Machine Learning, Addison-Wesley, 1989.

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM II

SUBJECT: SOFTWARE TESTING AND QUALITY ASSURANCE (ELECTIVE-II)

Lectures: 3 Hrs per week	**Theory: 100 Marks**

Objective:
After successfully completing the module student should be apply the testing fundamentals and testing skill to validate and verify the software system, also able to demonstrate knowledge of testing strategies by applying the different testing tools.

Pre-requisites:
Knowledge of Software Engineering.

DETAILED SYLLABUS

1. Software Testing Background: Infamous Software Error Case Studies, What Is a Bug? Why Do Bugs Occur? The Cost of Bugs, What Exactly Does a Software Tester Do? What Makes a Good Software Tester? The Software Development Process, Product Components, Software Project Staff, Software Development Lifecycle, Models, The Realities of Software Testing, Testing Axioms, Software Testing Terms and Definitions.
2. Testing Fundamentals : Examining the Specification, Performing a High-Level Review of the Specification, Low-Level Specification, Test Techniques, Black-Box Testing, Test-to-Pass and Test-to-Fail, Equivalence Partitioning, Data Testing, State Testing, Other Black-Box Test Techniques, Examining the Code, Static White-Box Testing: Examining the Design and Code, Formal Reviews, Coding Standards and Guidelines, Generic Code Review, Checklist, Testing the Software with X-Ray Glasses, Dynamic White-Box Testing, Dynamic White-Box Testing Versus Debugging, Testing the Pieces, Data Coverage, Code Coverage
3. Applying Testing Skills: Configuration Testing, An Overview of Configuration Testing, Approaching the Task, Obtaining the Hardware, Identifying Hardware Standards, Configuration Testing Other Hardware, Compatibility Testing, Compatibility Testing Overview, Platform and Application Versions, Standards and Guidelines, Data Sharing Compatibility, Foreign-Language Testing, Making the Words and Pictures Make Sense, Translation Issues, Localization Issues, Configuration and Compatibility Issues, How Much Should You Test? Usability Testing, User Interface Testing, ,What Makes a Good UI?, Testing for the Disabled: Accessibility Testing,
4. Testing the Documentation: Types of Software Documentation, The Importance of Documentation Testing, What to Look for When Reviewing Documentation, The Realities of Documentation Testing, Testing for Software Security, War Games the Movie, Understanding the Motivation, Threat Modeling, Is Software Security a Feature? Is Security Vulnerability a Bug? Understanding the Buffer Overrun, Using Safe String Functions, Computer Forensics, Website Testing, Web Page Fundamentals, Black-Box Testing, Gray-Box Testing, White-Box Testing, Configuration and Compatibility Testing, Usability Testing, Introducing Automation.

5. Supplementing Testing: Automated Testing and Test Tools ,The Benefits of Automation and Tools, Test Tools, Software Test Automation, Random Testing, Realities of Using Test Tools and Automation, Bug Bashes and Beta Testing, Having Other People Test Your Software, Test Sharing, Beta Testing, Outsourcing Your Testing
6. Working with Test Documentation: Planning Your Test Effort, The Goal of Test Planning, Test Planning, Writing and Tracking Test Cases, The Goals of Test Case Planning, Test Case Planning Overview, Test Case Organization and Tracking, Reporting What You Find, Getting Your Bugs Fixed, Isolating and Reproducing Bugs, Not All Bugs Are Created Equal, A Bug's Life Cycle, Bug-Tracking Systems , Measuring Your Success, Using the Information in the Bug Tracking Database
7. The Future: Software Quality Assurance, Quality Is Free, Testing and Quality Assurance in the Workplace, Test Management and Organizational Structures, Capability Maturity Model (CMM),ISO 9000, Software Quality and Software Metrics.

BOOKS

References:

1.Ron Patton, "Software Testing", Pearson publication.

2.Roger S Pressman, **"**Software Engineering: A Practitioner's Approach" 6th Edition, McGraw Hill,2005.

3.Marine Hutcheson, "Software Testing Fundamentals: Methods and Metrics", John Wiley Publication,2003.

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM II

SUBJECT: CRYPTOGRAPHY AND NETWORK SECURITY
(ELECTIVE-II)

Lectures: 3 Hrs per week	**Theory: 100 Marks**

Objective:

The course introduces the principles of number theory and the practice of network security and cryptographic algorithms. At the end of the course the student will understand: Data Encryption Standard and algorithms, IP and Web Security, Protocols for secure electronic commerce, Concepts of Digital Watermarking and Steganography.

Pre-requisites:

Probability theory and Discrete Mathematics

DETAILED SYLLABUS

1. Foundations of Cryptography and Security Ciphers and Secret Messages, Security Attacks and Services
2. Mathematical Tools for Cryptography Substitutions and Permutations, Modular Arithmetic, Euclid!s Algorithm, Finite Fields, Polynomial Arithmetic, Discrete Logarithms
3. Conventional Symmetric Encryption Algorithms Theory of Block Cipher Design Feistel Cipher Network Structures, DES and Triple DES, Modes of Operation (ECB,CBC, OFB,CFB), Strength (or Not) of DES
4. Modern Symmetric Encryption Algorithms IDEA, CAST, Blowfish, Twofish, RC2, RC5, Rijndael (AES) Key Distribution
5. Stream Ciphers and Pseudo Random Numbers, Pseudo random sequences, Linear Congruential Generators, Cryptographic Generators, Design of Stream Cipher, One Time Pad
6. Public Key Cryptography, Prime Numbers and Testing for Primality, Factoring Large Numbers, RSA, Diffie-Hellman, ElGamal, Key Exchange Algorithms, Public-Key Cryptography Standards
7. Hashes and Message Digests Message Authentication, MD5, SHA, RIPEMD, HMAC
8. Digital Signatures, Certificates, User Authentication, Digital Signature Standard (DSS and DSA), Security Handshake Pitfalls, Elliptic Curve Cryptosystems
9. Authentication of Systems Kerberos V4 and V5, X.509 Authentication Service
10. Electronic Mail Security Pretty Good Privacy (PGP), S/MIME, X.400
11. 12 3/28 IP and Web Security Protocols IPSec and Virtual Private Networks, Secure Sockets and Transport Layer (SSL and TLS)
12. Electronic Commerce Security, Electronic Payment Systems, Secure Electronic Transaction (SET), CyberCash, iKey Protocols, Ecash (DigiCash)
13. Intrusion detection – password management – Viruses and related Threats – Virus Counter measures – Firewall Design Principles – Trusted Systems
14. Digital Watermarking and Steganography, Biometrics for security- signature verification, figure print recognition, voice recognition, Iris recognition system.

BOOKS

Text Books:

1. William Stalling, "Cryptography and Network Security, Principles and Practice", Pearson/PHI Publication
2. B A Forouzan, "Cryptography and Network Security", TMH

References:

1. Bruce Schneier, "Applied Cryptography", John Wiley & Sons Inc
2. Charles B. Pfleeger, Shari Lawrence Pfleeger, "Security in Computing", Pearson Education
3. D Denning, "Cryptography and Data Security", Addision-Welesly

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM II

SUBJECT: PATTERN RECOGNITION
(ELECTIVE-II)

Lectures: 3 Hrs per week	**Theory: 100 Marks**

Objective: This course teaches the fundamentals of techniques for classifying multi-dimensional data, to be utilized for problem-solving in a wide variety of applications, such as engineering system design, manufacturing, technical and medical diagnostics, image processing, economics, and psychology.

Pre-requisite: Linear Algebra, Probability and Statistics

DETAILED SYLLABUS

1. **Introduction:** Machine perception, Pattern recognition systems, Design cycle, Learning and Adaptation
2. **Bayesian Decision Theory:** Bayesian decision theory: Continuous features, Minimum-error rate classification, classification, Classifiers, Discriminant functions and Decision surfaces, Normal density, Discriminant functions for normal density, Bayes Decision theory: discrete features
3. **Maximum-Likelihood and Bayesian Parameter Estimation:** Maximum likelihood estimation, Bayesian estimation, Bayesian parameter estimation: Gaussian caseand General theory, Prolems of dimentionality, Hidden Markov Model
4. **Nonparametric Techniques:** Density estimation, Parzen windows, k_n-Nearest-Neighbor estimation, Nearest-Neighbor rule, Matrics and Nearest-Neighbor classification
5. **Linear Discriminants Functions:** Linear discriminant functions and decision surfaces, Generalised linear discriminant functions, 2-Category linearly separable case, Minimising the Perceptron criterion function, Relaxation procedure, Non-separable behavior, Minimum squared error procedure, Ho-Kashyap procedures, Multicategory generalizations
6. **Nonmetric Methods:** Decision tree, CART, ID3, C4.5, Gramatical methods, Gramatical interfaces
7. **Algorithm Independent Machine Learning:** Lack of inherent superiority of any classifier, Bias and Variance, Resampling for estimating statistic, Resampling for classifier design, Estimating and comparing classifiers, Combining classifiers
8. **Unsupervised Learning and Clustering:** Mixture densities and Identifiability, Maximum-Likelihood estimations, Application to normal mixtures, Unsupervised Bayesian learning, Data description and clustering criterion function for clustering, Hierarchical clustering
9. **Applications of Pattern Recognition**

BOOKS

Text Books:

1. Duda, Hart, and Stock, "*Pattern Classification*", John Wiley and Sons.
2. Gose, Johnsonbaugh and Jost, "*Pattern Recognition and Image analysis*", PHI

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM II

SUBJECT: Mobile Computing
(ELECTIVE-II)

Lectures: Hrs per week	**Theory: 100 Marks**

Objective:
After successful completion of the course student should get knowledge about: Mobile Computing Architecture, mobile technologies: GSM, Bluetooth, GPRS, CDMA and should be capable to develop mobile computing applications.

Pre-requisites:
Knowledge of Computer Networks.

DETAILED SYLLABUS

1.Introduction: Mobile Computing, Dialogue Control, Networks, Middleware and Gateways, Application and Services, Developing Mobile Computing Applications, Security in Mobile Computing.

2.Mobile Computing Architecture: Internet – The Ubiquitous Network, Architecture for Mobile Computing, Three-Tier Architecture, Design considerations for Mobile Computing, Mobile Computing through Internet, Making Existing Applications Mobile-Enabled.

3.Emerging Technologies: Introduction, Bluetooth, Radio Frequency Identification, Wireless Broadband, Mobile IP, IPV6, Java card.

4 Mobile Transport Layer: Traditional TCP - Congestion Control, Slow Start, Fast Retransmit/Fast Recovery, Implications on Mobility, Classical TCP Improvements - Indirect TCP, Snooping TCP, Mobile TCP, Fast Retransmit/Fast Recovery, Transmission/Time-Out Freezing, Selective Retransmission, Transaction Oriented TCP.

5.Support for Mobility: File Systems – Consistency, Coda, Little work, Ficus, Mio-NFS, Rover, World Wide Web - Hypertext Transfer Protocol, Hypertext Markup Language, Some Approaches that Might Help Wireless Access, System Architectures, Wireless Application Protocol - Architecture, Wireless Datagram Protocol, Wireless Transport Layer Security, Wireless Transaction Protocol, Wireless Session Protocol, Wireless Application Environment, Wireless Markup Language, WML script, Wireless Telephony Application, Push Architecture, Push/Pull Services.

6.Global System for Mobile Communications (GSM): Global System for Mobile Communications, GSM Architecture, GSM Entities, Call Routing in GSM, PLMN Interfaces, GSM Addresses and Identifiers, Network Aspects in GSM, GSM Frequency Allocation, Authentication and Security.

7.General Packet Radio Service (GPRS): Introduction, GPRS and Packet Data Network, GPRS Network Architecture, GPRS Network Operations, Data Services in GPRS, Applications for GPRS, Limitations of GPRS, Billing and Charging in GPRS.

8.CDMA and 3G: Introduction, Spread-Spectrum Technology, Is-95, CDMA versus GSM, Wireless Data, Third Generation Networks, Applications on 3G.

9.Security Issues in Mobile Computing: Introduction, Information

Security, Security Techniques and Algorithms, Security Protocols, Public Key Infrastructure, Trust, Security Models, Security Frameworks for Mobile Environment.
BOOKS
Text Books:
1. Talukder Asoke K. and Yavagal Roopa R ," Mobile Computing (Technology, Applications and Service Creation) ",Tata Mcgraw-Hill. 2. Jochen Schiller, Addison-Wesley, "Mobile Communications ",2nd Edition.

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM II

SUBJECT: LABORATORY PRACTICE-II

Practical: 6 Hrs per week	**Term Work: 100 Marks** **Oral: 50 marks**

DETAILED SYLLABUS

Experiments/Assignments based on

1. Advanced Database Management Systems
2. Soft Computing
3. Elective- II

The concerned subject in-charge should frame minimum of six laboratory assignments, two from each subject.

M.E. COMPUTER SCIENCE & ENGINEERING
FIRST YEAR TERM II

SUBJECT: SEMINAR-II

Practical: 4 Hrs per week	**Term Work: 100 Marks**

DETAILED SYLLABUS

Seminar on related state of the art topic of student's own choice approved by the department.

TERM WORK

1. The term-work & presentation of the Seminar-II will be evaluated by departmental committee consisting of guide and two faculty members of the department appointed by Director/Principal of the college as per the recommendation of the Head of the Department.

M.E. COMPUTER SCIENCE & ENGINEERING
SECOND YEAR TERM I

SUBJECT: SEMINAR-III

Practical: 4 Hrs per week	**Term Work: 50 Marks** **Oral: 50 Marks**

DETAILED SYLLABUS

Seminar on special topic. The topic should be on any of the area not included in the regular curriculum. The report should include detailed study of specific concept (i.e. analysis, design & implementation.). This can be a theoretical study or practical implementation approved by the department/guide.

TERM WORK

1. Seminar-III should be conducted at the end of Second Year Term I.
2. The term-work of the Seminar-III will be evaluated by departmental committee consisting of guide and two faculty members of the department appointed by Director/Principal of the college as per the recommendation of the Head of the Department.
3. The Seminar-III presentation will be evaluated by examiners appointed by University, one of which should be the guide.
4. Student must submit the Seminar Report in the form of soft bound copy
5. The marks of seminar-III should be submitted at the end of Second Year Term I to the University.

M.E. COMPUTER SCIENCE & ENGINEERING
SECOND YEAR TERM I

SUBJECT: PROJECT STAGE-I

Practical: 18 Hrs per week	**Term Work: 100 Marks**

DETAILED SYLLABUS

Project will consist of a system Development in Software/Hardware. Project Work should be carried out using Software Engineering principles and practices.

TERM WORK

The term-work of the Project Stage-I will be evaluated by departmental committee consisting of guide and two faculty members of the department appointed by Director/Principal of the college as per the recommendation of the Head of the Department.

M.E. COMPUTER SCIENCE & ENGINEERING
SECOND YEAR TERM II

SUBJECT: PROGRESS SEMINAR

	Term Work: 50 Marks

1. Progress Seminar should be conducted in the middle of Second Year Term II.
2. The Progress Seminar Term-Work will be evaluated by departmental committee consisting of guide and two faculty members of the department appointed by Director/Principal of the college as per the recommendation of the Head of the Department.
3. Student must submit the progress report in the form of soft bound copy.
4. The marks of progress seminar should be submitted along with the marks of Project Stage-II.

M.E. COMPUTER SCIENCE & ENGINEERING
SECOND YEAR TERM II

SUBJECT: PROJECT STAGE-II

Practical: 18 Hrs per week	**Term Work: 150 Marks** **Oral:100 Marks**

DETAILED SYLLABUS

This is continuation of Project Stage-I. The complete System Development in software/hardware carried out using Software Engineering principles and practices is expected. It should be a working system either software or hardware or combination of both.

He/she has to present/publish atleast one paper in reputed National/International Journal/Conference on his/her Project work before submission of his/her Thesis/Dissertation.

TERM WORK

1. The Term Work of Project Stage –II will be assessed jointly by the pair of Internal (Guide) and External examiner along with oral examination of the same.

STRUCTURE OF

M.E. Electronics & Telecommunication (Digital Electronics)

W.E.F. 2010-2011

The scheme of teaching & examination as per university syllabus applicable to ME Electronics & Telecommunication (Digital Electronics) will be as follows.

STRUCTURE OF
M.E. ELECTRONICS AND TELECOMMUNICATION
(DIGITAL ELECTRONICS)
First Year Term-I

Sr. No.	Subject	Teaching Scheme Hours/week		Examination Scheme				
		L	P	Paper duration hours	Maximum marks			
					Paper	TW	PR	OR
1	Advanced Instrumentation System	3	-	3	100	-	-	-
2	Advanced Digital Signal Processing	3	-	3	100	-	-	-
3	Digital System Design	3	-	3	100	-	-	-
4	VLSI Design	3	-	3	100	-	-	-
5	Elective -I	3	-	3	100	-	-	-
6	Laboratory Practice –I	-	6	-	-	100	-	50
7	Seminar-I	-	4	-	-	100	-	-
Total		**15**	**10**		**500**	**200**		**50**
Grand Total		**25**			**750**			

List of Subjects for Elective – I

1. Parallel Computing
2. Biomedical Instrumentation
3. Wireless & Mobile Communication

STRUCTURE OF
M.E. ELECTRONICS AND TELECOMMUNICATION
(DIGITAL ELECTRONICS)
First Year Term-II

Sr. No.	Subject	Teaching Scheme Hours/week		Examination Scheme				
		L	P	Paper duration hours	Maximum marks			
					Paper	TW	PR	OR
1	Image Processing & Pattern Recognition	3	-	3	100	-	-	-
2	Embedded System Design	3	-	3	100	-	-	-
3	Microelectronics Circuit Design	3	-	3	100	-	-	-
4	Advanced Computer Network	3	-	3	100	-	-	-
5	Elective –II	3	-	3	100	-	-	-
6	Laboratory Practice –II	-	6	-	-	100	-	50
7	Seminar-II	-	4	-	-	100	-	-
Total		**15**	**10**		**500**	**200**		**50**
Grand Total		**25**			**750**			

List of Subjects for Elective – II

1. Advanced Digital Communication.
2. Artificial Intelligence
3. Modeling and Simulation Techniques

STRUCTURE OF
M.E. ELECTRONICS AND TELECOMMUNICATION
(DIGITAL ELECTRONICS)
Second Year Term-I

Sr. No.	Subject	Teaching Scheme Hours/week		Examination Scheme				
		L	P	Paper duration hours	Maximum marks			
					Paper	Term work	Practical	Oral
1	Seminar –III	-	04	-	-	50	-	50
2	Project Stage - I	-	18	-	-	100	-	-
Total		**-**	**22**	**-**	**-**	**150**	**-**	**50**
Grand Total		**22**		**200**				

STRUCTURE OF
M.E. ELECTRONICS AND TELECOMMUNICATION
(DIGITAL ELECTRONICS)
Second Year Term-II

Sr. No.	Subject	Teaching Scheme Hours/week		Examination Scheme				
		L	P	Paper duration hours	Maximum marks			
					Paper	Term work	Practical	Oral
1	Project Seminar	-	-	-	-	50	-	-
2	Project Stage - II	-	18	-	-	150	-	100
Total		**-**	**18**	**-**	**-**	**200**	**-**	**100**
Grand Total		**18**		**300**				

Grand Total : 2000

M.E. ELECTRONICS AND TELECOMMUNICATION
(DIGITAL ELECTRONICS)
First Year Term-I

Subject Laboratory Practice-I

Practical: 6 Hrs Per week	**Term work:** 100 Marks **Oral:** 50 Marks

Detailed syllabus

Experiment/ Assignments based on

1. Advanced Instrumentation System
2. Advanced Digital Signal Processing
3. Digital System Design

Note: The concern subject incharge in consultation with H.O.D, should frame minimum of six laboratory assignments, two from each subject.

Subject Seminar-I

Practical: 4 Hrs Per week	**Term work:** 100 Marks

Detailed syllabus

Seminar on related state of art topic of students of own choice approved by the department.

Term work

The Term work and presentation will be evaluated by departmental committee consisting of two faculty members of the department appointed by Principal as per the recommendation of the Head of the Department.

M.E. ELECTRONICS AND TELECOMMUNICATION
(DIGITAL ELECTRONICS)
First Year Term-II

Subject Laboratory Practice-II

Practical: 6 Hrs Per week	**Term work:** 100 Marks **Oral:** 50 Marks

Detailed syllabus

Experiment / Assignments based on

1. Image Processing & Pattern Recognition
2. Embedded System Design
3. Advanced Digital Communication.

Note: The concern subject incharge in consultation with H.O.D, should frame minimum of six laboratory assignments, two from each subject.

Subject Seminar-II

Practical: 4 Hrs Per week	**Term work:** 100 Marks

Detailed syllabus

Seminar on related state of art topic of students of own choice approved by the department.

Term work

The Term work and presentation will be evaluated by departmental committee consisting of two faculty members of the department appointed by Principal as per the recommendation of the Head of the Department.

M.E. ELECTRONICS AND TELECOMMUNICATION
(DIGITAL ELECTRONICS)
Second Year Term-I

Subject Seminar –III

Practical: 4 Hrs Per week	**Term work:** 50 Marks **Oral:** 50 Marks

Detailed syllabus

Seminar on special topic. The topic should be on any of the area not included in the regular curriculum. The report should include detailed study of specific concept (i.e analysis, design and implementation). This can be a theoretical study or practical implementation approved by the guide and department.

Term work

1. Seminar III should be conducted at the end of Second Year Term-I
2. The term-work of the Seminar-III will be evaluated by departmental committee consisting of guide and two faculty members of the department appointed by Director / Principal of the college as per the recommendation of the Head of the Department.
3. The Seminar-III presentation will be evaluated by the examiners appointed by University, one of which should be guide.
4. Student must submit the seminar report in the form of soft bound copy.
5. The marks of seminar-III should be submitted at the end of the Second Year Term-I to the University.

Subject Project Stage-I

Practical: 18 Hrs Per week	**Term work:** 100 Marks

Detailed syllabus

Project stage-I It is the integral part of the dissertation project. The project should be based on the knowledge acquired by the student during the course work and should contribute to the needs of the society. The project aims to provide an opportunity of designing and building, complete system or subsystem in an area where the student like to acquire specialized skills. Project will consist of a system development in Software/ Hardware. The student should present the progress report of the project. It will consist of problem statement, literature survey; project overview and scheme of implementation.

Term work

The term-work of the project stage-I will be evaluated by departmental committee consisting of guide and two faculty members of the department appointed by the Director/Principal of the college as per the recommendation of the Head of the Department.

M.E. ELECTRONICS AND TELECOMMUNICATION
(DIGITAL ELECTRONICS)
Second Year Term-II

Subject Project Seminar

	Term work: 50 Marks

1. The Project Seminar should be conducted at the middle of Second Year Term-II
2. The Project Seminar term-work will be evaluated by departmental committee consisting of guide and two faculty members of the department appointed by Director / Principal of the college as per the recommendation of the Head of the Department.
3. Student must submit the Project Seminar report in the form of soft bound copy.
4. The marks of seminar-III should be submitted at the end of the Second Year Term-I to the University.

Subject Project Stage-II

Practical: 18 Hrs Per week	**Term work:** 150 Marks **Oral:** 100 Marks

Detailed syllabus

This is continuation of Project Stage-I. The complete system development in software / Hardware carried out using Electronics and Telecommunication Engineering principles and practices is expected. It should be working system either software or hardware or combination of both.

He/ She has to present / publish atleast one paper in reputed National / International Journal/ Conference on his/ her project work before submission of his / her Thesis/ Dissertation.

Term work

1. The term-work of the Project Stage-II will be evaluated by departmental committee consisting of guide and two faculty members of the department appointed by Director / Principal of the college as per the recommendation of the Head of the Department.
2. The Project Stage-II oral will be evaluated by the examiners appointed by University, one of which should be guide.

NORTH MAHARASHTRA UNIVERSITY JALGAON
M.E. ELECTRONICS AND TELECOMMUNICATION (Digital Electronics)

W.E.F : 2010-11
Term – I

ADVANCED INSTRUMENTATION SYSTEM

Teaching scheme:
Lectures: 3 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)

Digital Instruments:- Introduction, Digital Panel Meters, Digital Frequency Meters, Basic Circuit for Frequency measurements, High Frequency measurements, Digital Measurements of time, Period Measurement, Ratio and Multiple Ratio Measurement, Universal Counter, Digital Measurement of Mains Frequency.

Signal Analyzer :- Wave Analyzer, Harmonic Distortion Analyzer, Spectrum Analyzer, Network Analyzer, Logic Analyzer, Protocol Analyzer.

PC Based Data Acquisition System: - PC Based Instrumentation System, Introduction to PC Based Data Acquisition System.
Introduction to Smart Sensors:- Digital Sensors, Case Studies of Real Time PC Based Instrumentation System, Virtual Instruments, Intelligent Instruments.

Automated Measurement System :- Need And Requirement Automatic Test Equipments (ATE) Computer Based And Computer Controlled ATE Switches in ADTE , ATE For PCB Testing, ATE for Component Testing, IEEE- 488 Electronic Instruments BUS Standards.

Computer Control :- Hierarchy of Computer Control For Industry , Direct Digital Control, Distributed Digital Control, Supervisory Control And Data Acquisition System (SCADA), NC, CNC.

Introduction to process control :- Control System, Process Control Principles, Servo mechanism, Discrete Control System, Process Control Block Diagram , Anlog and Digital Processing , Feedback Control, Basic Principle of Single Loop Controller , Two Position Control, Mutiposition Control, Proportional ,Integral , Derivative Controller (Overview), Multivariable Control , Cascade Control, Ratio Control , Feed Forward Control.

Control Modes:- Close loop Response , Control loop transfer function, Analysis of Chemical Reactor.

Intelligent Controller :- Programmable Logic Controller, PLC Programming Technique , Fuzzy Logic Controller.
Industrial Control Application:- Cement Plant , Thermal Power Plant, Irrigation Cannal Management, Steel Plant.

References :

1. Clyde E. Coombs, Electronic Instruments Handbook(3/e), McGraw Hill International.
2. Mc Lachlan & Buchla, Applied Electronic Instrumentation & Measurement , 1992, Prentice Hall International..
3. Pallas Areny & Webstor, Sensors & Signals Conditioning , (2/e)1994, J.Wiley & sons
4. Critis Johnson, Process control Instrumentation Technology, PHI
5. H.S.Kalasi, Electronic Instrumentation (2/e), Tata McGraw Hill International
6. Bela G. Liptak, Butterworth Heinemann, Instrument Engineer's Handbook (3/e) Process Control,
7. Aibert D. Helfric, William D. Cooper, Modern Electronic Instrumentation And Measurement Technique
8. Krishna Kant, Computer Based Industrial Control.

NORTH MAHARASHTRA UNIVERSITY JALGAON
M.E. ELECTRONICS AND TELECOMMUNICATION (Digital Electronics)
W.E.F : 2010-11
Term – I

ADVANCED DIGITAL SIGNAL PROCESSING

Teaching scheme:
Lectures: 3 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)

Discrete time signal & systems, its representation, types of discrete time system,DFT, IDFT, FFT(DIF&DIT). Realization of FIR and IIR filter

Multirate digital signal processing-decimation by factor D, interpolation, filter design & implementation, sampling rate conversion, application of multirate signal processing.

Power spectral estimation- parametric & nonparametric method for power spectral estimation, minimum variance, and realization of FIR & IIR filters.

Least mean square Adaptive filter: Overview of the structure, operation of the LMS algorithm, LMS adaptive algorithm, statistical LMS theory, Comparison of the LMS algorithm with the steepest Descent algorithm, Computer experiment on adaptive prediction, Computer experiment on adaptive equalization, Computer experiment on a minimum- variance distortion less response beam former, Directionality of convergence of the LMS algorithm for Nonwhite Inputs, Robustness of the LMS filter, Upper bound on the step size Parameters for Different Scenarios, Transfer function approach for deterministic input summary problems.

Design of digital filters-symmetric & antisymmetric, linear phase, optimum, Equiripple, FIR differentiation, Hilbert's transformers.

Design of IIR filters-impulse invariance, bilinear transformation, matched transformation, frequency transformation in analog & digital domain.

Design of digital filters based on least square method.

Application of DSP to speech processing & radar signal processing.

Introduction to TMS320c62XX DSP processors.

References :

1. John Proakis, Digital Signal Processing Prentice Hall
2. A.V.Oppenhiem & R.W.Schafer, Digital Signal Processing - Prentice Hall
3. L.R.Rabiner & B.Gold,Theory & application of digital signal processing- Prentice Hall
4. A.Antiniou, Digital Filters; analysis, design & application- Mcgraw Hill
5. Salivahanan,vallavaraj,gnanapriya, Digital Signal Processing-TMH
6. S.K.Mitra, Digital Signal Processing - TMH

NORTH MAHARASHTRA UNIVERSITY JALGAON
M.E. ELECTRONICS AND TELECOMMUNICATION (Digital Electronics)
W.E.F : 2010-11
Term – I

DIGITAL SYSTEM DESIGN

Teaching scheme:
Lectures: 3 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)

Design of synchronous and asynchronous sequential logic circuits working in the fundamental mode and pulse mode. Essential hazards Unger's theorm. Map entered variable and synthesis of random logic. Fault detection and error correction.
Register- transfer level systems, Execution Graph, Organization of System, Implementation of RTL Systems, Analysis of RTL Systems, Design of RTL Systems.
Data Subsystems, Storage Modules, Functional Modules, Data paths, Control Subsystems, Micro programmed Controller, Structure of a micro programmed controller, Micro instruction Format, Micro instruction sequencing, Micro instruction Timing, Basic component of a micro system, memory subsystem.
I/O subsystem, Processors, Operation of the computer and cycle time. Binary Decoder, Binary Encoder, Multiplexers and Demultiplexers, Floating Point Arithmetic-Representation of Floating Point Number, Floating Point Multiplication.
Logic simulation: General fault simulation techniques, statistical fault analysis. Testing for single stuck fault: Basic issues, ATG for SSF in combined circuits. ATG for SSFs in sequential circuits. PLA testing.
Design for Testability: Classical testability scan design, compressing tech. built in self test logic level diagnosis, self checking design.
Specific digital system: Deign such as digital IS tester Microcontroller cards, PC add on cards design, PLA based product design.

References:

1. M. Ercegovac, T. Lang and L.J. Moreno, "Introduction to Digital Systems", Wiley,2000
2. John F. Wakerly,"Digital Design principles and practices",3rd edition, PHI publications.
3. Melvin A Breuer, Arthur D Friedmen, MironAbra MOVICI jaico Publishing.

4. House- Digital system testing and testable design.
5. B Holdsworth Digital Logic Design.
6. Puri V.K Digital Electronics
7. Z. Navabi, " VHDL-Analysis and Modeling of Digital Systems", TMH
8. Norman - Digital Logic design principal John Wiley Pub.
9. Samual – Digital Circuit logic design –PHI.
10. Charles H. Roth, "Digital system design using VHDL", Thomson Publication.
11. Balabanian,"Digital logic design principles",Wiley publication.
12. Stephen Brown, "Fundamentals of digital logic", TMH publication.

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M.E. ELECTRONICS AND TELECOMMUNICATION (Digital Electronics)
W.E.F : 2010-11
Term – I

VLSI DESIGN

Teaching scheme:
Lectures: 3 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)

Review of VHDL Verilog Programming, Hardware modeling with Verilog / VHDL, different verilog /VHDL constructs, and Logic Synthesis. Levels of abstraction, Elements (Data flow, Behavioral, Structural, Mixed and switch level Description).

simulation process, types of simulators FSM modeling, test benches, generics & attributes, synthesis tools features & optimization in VHDL, Synthesis guidelines, Timing issues: terminology, flow diagram, clock, gated clock, setup & hold time, violation,Meta stability, Static & Dynamic timing analysis.

CMOS & Bi-CMOS logic families & PLD architecture, Power dissipation, noise and ESD issues, clock distribution, signal connections, synchronous and asynchronous design features, and memory system design. CMOS systems Design, CMOS Testing. Classification of CPLD architecture, CPLD 9500 series, Xilinx FPGA –XC4000 series,

Designing steps in ASIC, Physical Design flow, Different type of ASIC, CAD Tools, System Partitioning, Estimating ASIC size, Power dissipation, FPGA partitioning methods,

Floor planning, Placement Physical design flow; Information Formats; global routing, detailed routing; special routing; circuit extraction and DRC

References :

1. Douglas Perry, VHDL - McGraw Hill Publication
2. Janic Bergerson, VHDL Using Testbenches
3. Yu. Chin Hsu, K. Tsai, VHDL Modeling for Digital Design Synthesis.-

Kluwer publishers.
4. Xilinx PLD data manual
5. Michael John sebastiab smith, “Application specific IC”, Addison Wesley publication.
6. K. K. Parhi , “VLSI Digital signal processing systems Design & Implementation” John Wiley & Sons
7. Neil Weste and Eshraghian, “Principles of CMOS VLSI Design “(Second Edition) Pearson
Education Asia (Addison – Wesley Publication Company)
8. James E Buchnan – BiCMOS-CMOS system design McGraw Hill Publication.

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Term – I

Elective – I
PARALLEL COMPUTING

Teaching scheme:
Lectures: 3 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)

Parallel Computer Models: The state of computing, Multiprocessors and multi-computers, Multivector and SIMD computers, Architectural development tracks

Program And Network Properties: Conditions of parallelism, Data and resource dependences, Hardware and software parallelism, Program partitioning and scheduling, Grain size and latency, Program flow mechanisms, Control flow versus data flow, Data flow architecture, Demand driven mechanisms, Comparisons of flow mechanisms

System Interconnect Architectures: Network properties and routing, Static interconnection networks, Dynamic interconnection Networks, Multiprocessor system interconnects, Hierarchical bus systems, Crossbar switch and multiport memory, Multistage and combining network.

Processors and Memory Hierarchy: Advanced processor technology, Instruction-set Architectures, CISC Scalar Processors, RISC Scalar Processors, Superscalar Processors, VLIW Architectures, Vector and Symbolic processors Memory Technology: Hierarchical memory technology, Inclusion, Coherence and Locality, Memory capacity planning, Virtual Memory Technology.

Backplane Bus System: Backplane bus specification, Addressing and timing protocols, Arbitration transaction and interrupt, Cache addressing models, direct mapping and associative caches.

Pipelining: Linear pipeline processor, Nonlinear pipeline processor, Instruction pipeline design, Mechanisms for instruction pipelining, Dynamic instruction scheduling, Branch handling techniques, Arithmetic Pipeline Design, Computer arithmetic principles, Static arithmetic pipeline, Multifunctional arithmetic pipelines.

Vector Processing Principles: Vector instruction types, Vector-access memory schemes.

Synchronous Parallel Processing: SIMD Architecture and Programming Principles, SIMD Parallel Algorithms, SIMD Computers and Performance Enhancement

References:

1 Kai Hwang, “Advanced Computer Architecture”, Parallelism, Scalability, Programmability”, McGraw Hill Inc. Ed. 1993.
2 V. Rajaranam & C.S.R.Murthy, “Parallel Computer”; PHI.
3 William Stallings, “Computer organization & Architecture”, PHI, New Delhi, 6th edition.
4 Dezso’Sima, “Kalsuk’Advanced computer Architectures”, Terence Fountain & Peter Pearson’s Edation. (2nd Edition)
5 Hwang and Degroot, “Parallel Processing for Supercomputers and AI”, (Eds) McGraw Hill.
6 J. P. Hayes, “Computer Architecture And Organization”; MGH.
Harvey G. Cragon, “Memory System and Pipelined Processors”; Narosa Publication.
7 R. K. Ghose, Rajan Moona & Phalguni Gupta, “Foundation of Parallel Processing”; Narosa Publications. Kai Hwang and Zu, “Scalable Parallel Computers Architecture”; MGH.

NORTH MAHARASHTRA UNIVERSITY JALGAON
M.E. ELECTRONICS AND TELECOMMUNICATION (Digital Electronics)
W.E.F : 2010-11
Term – I

Elective - I
BIOMEDICAL INSTRUMENTATION

Teaching scheme:
Lectures: 3 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)

Measuring, Recording and Monitoring Instruments

Anatomy and Physiology, Physiological Systems of the Body, Basic Medical Instrumentation System, Performance Requirements of Medical Instrumentation System, Intelligent Instrumentation System, General Constraints in Design of Medical Instrumentation System, Regulation of Medical Devices.

Physiological transducers: Displacement, position and motion transducers, Pressure transducers, Transducers for Body Temperature Measurement, Photoelectric transducers, Optical Fibre sensors, Biosensors

Recording systems: Basic Recording systems, Biomedical signal Analysis Techniques, Signal Processing Techniques, Potentiometric Recorders, Digital Recorders, Instrumentation tape Recorders,

Biomedical Recorders: Electrocardiograph, Vectorcardiograph (VCG), Phonocardiograph (PCG), Electroencephalograph (EEG), Electromyograph (EMG), Other Biomedical Recorders, Biofeedback Instrumentation

Patient Monitoring Systems: Bedsides Patient Monitoring Systems, Central Monitors, Measurements of Heart Rate, Measurements of Pulse Rate, Blood Pressure Measurement, Measurement of Temperature, Measurement of Respiration rate

The Matched Filter, Detection of the P Wave,Homomorphic Filtering, Application- ECG Rhythm Analysis, Identification of Heart Sounds, Waveshape and waveform Complexity, Analysis of Event-related Potentials, Morphological Analysis of ECG Waves, Envelope Extraction and Analysis of Activity, Application- Normal and Ectopic ECG Beats, Analysis of Exercise ECG.

Modern Imaging Systems: X-ray Machines and Digital Radiography Portable and mobile X-ray units, Digital Radiography, X-ray Computed Tomography, Computed Tomography, System components, Gantry Geometry, Patient Dose in CT Scanners,

Nuclear Medical Imaging System, Radiation Detectors, Pulse Height Analyzer, Uptake Monitoring Equipment, Radio-isotope Rectilinear Scanner, The Gamma Camera, Emission Computed Topography (ECT) Single Photon Emission Computed Topography (SPECT), Positron Emission Topography (PET scanner)

Ultrasonic Imaging Systems: Diagnostic Ultrasound, Medical Ultrasound, Basic Pulse-echo Apparatus, A-Scan, B-Scanner.

Laser Applications In Biomedical Field: The laser, Pulsed Ruby laser, ND-YAG laser, Helium –Neon Laser, Argon Laser, CO2 Laser, Excimer Lasers, Semiconductors Laser, Laser Safety

References:

1. Cromwell - Biomedical Instrumentation, Pearson
2. Khandpur - Handbook of Biomedical Instrumentation
3. Webster - Biomedical Instrumentation, Wiley
4. R. M. Rangayyan “Biomedical Signal Analysis- A case study approach”, Wiley Publications.
5. Eugene N Bruce “Biomedical signal processing and signal modeling”, Wiley publications.

W.E.F : 2010-11
Term – I

Elective - I

WIRELESS & MOBILE COMMUNICATION

Teaching scheme:
Lectures: 3 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)

Basics: History of wireless communication, and future trends, Wireless Generations and Standards, Cellular Concept and Cellular System Fundamentals, Trunking Cell Splitting and Sectoring, Mobile Radio signal propagation, path loss and channel models.

Speech coding for wireless system and application like PCM, DPCM, DM, Vocoder & Linear Predictive coding. Performance comparison.

Wireless LAN
IEEE802-11Hiper LAN, Bluetooth, Adhoc Network: Characteristic, Performance issue, Routing in mobile host.

Wireless Networking:
Difference between wireless & fixed telephone n/w, development, transmission hierarchies, traffic routing, wireless data services, common channel signaling, ISDN, SS7, global cellular network, Interoperability, PCS/PCNs, Protocols for n/w access and n/w data base, UMTS.

Wireless systems and standards:
AMPS, ETACS, United state of digital cellular, (IS 54 and IS 136) GSM, CDMA (IS95), CT2 Standards for cordless telephone, Digital European cordless telephone , PACs, PDC, Personal handy phone systems, US PCS & ISM bands, US wireless cable TV, IEEE802.11.

References:

1. Walker, J.: Mobile Information Systems. Artech House, Inc. 1990, Boston London
2. Mehrotra, A.: GSM System Engineering. Artech House, Inc. 1997, Boston London
3. Redl, S.M., Weber, M.K., Oliphant, M.W.: An Introduction to GSM. Artech House, Inc. 1995, Boston London
4. Feher, Wireless Digital Communication- 1991, PHI.

5. Vijay K. Garg, and J.E. Wilkes, Principles & applications of GSM –1999 – Prentice hall PTR.
6. Roger L. Freeman, Telecom Transmission handwook 4th ed 1998 John Wiley & Sons. Inc. New York.
7. Lee, Mobile Cellular Telecomm, 1995 Mc Graw Hill Inc.
8. J. Schiller, Mobile Communication, Addision Wiley
9. William C.Y. Lee, Mobile Comm. Design Fundamental. John wiley.
10. Mark Ceampa, Design & Implementation of Wireless LANs, Thomson Learning.

Term – I I

IMAGE PROCESSING AND PATTERN RECOGNITION

Teaching scheme:
Lectures: 3 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)

Digital Image fundamentals : Basic Image Processing steps, image acquisition, presentation of gray scale and modeling. Human visual perception, sampling and quantization, basic relationships between pixels. Histogram analysis and equalization, geometric image

Applications of pattern recognition, statistical decision theory, image processing and analysis.

Probability: Introduction, probability of events, random variables, Joint distributions and densities, moments of random variables, estimation of parameters from samples, minimum risk estimators Statistical Decision Making: Introduction, Baye's Theorem, multiple features, conditionally independent features, decision boundaries, unequal costs of error, estimation of error rates, the leaving-one—out technique. Characteristic curves, estimating the composition of populations.

Nonparametric Decision Making: Introduction, histograms, Kernel and window estimators, nearest neighbor classification techniques, adaptive decision boundaries, adaptive discriminate Functions, minimum squared error discriminate functions, choosing a decision making technique.

Clustering: Introduction, hierarchical clustering, partitional clustering Artificial Neural Networks, PCA, ICA, SVM.

References:

1) R. C. Gonzalez & Woods, "Digital Image Processing" – Addison Wesley IIIrd Ed.
2) A. K. Jain, "Fundamentals of Digital Image Processing"– Prentice Hall Inc.
3) Robert Jschalkoff, "Digital Image Processing & Computer vision : An introduction to theory & Implementation"– John wiley & Sons Inc.
4) K. R. Castleman, "Digital Image Processing" – PHI
5) W. K. Pratt, "Digital Image Processing" .(3 Ed.) John.Wiley.
6) B. Chanda and D.Mujumdar,"Digital Image Processing & Analysis".-PHI, New Delhi, 2000.

Term – I I

EMBEDDED SYSTEM DESIGN

Teaching scheme:
Lectures: 3 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)

Embedded system Introduction:
Introduction to Embedded System, History, Design challenges, optimizing design metrics, time to market, applications of embedded systems and recent trends in embedded systems, embedded design concepts and definitions, memory management, hardware and software design and testing, communication protocols like SPI, SCI, I2C, CAN etc

System Architecture:
ARM7/ARM9 architecture, instruction set, thumb Instruction set, Pipeline, memory management, Bus architecture, Programming concepts, Embedded programming in c and C++.

Multiprocessors Scheduling: Model of multiprocessor & distributed systems, Multiprocessor priority ceiling protocol, Elements of scheduling algorithms for end-to-end periodic tasks, Schedulability of fixed priority end-to-end periodic tasks, end-to-end tasks in heterogeneous systems.

Real Time systems: Characterizing real time systems & tasks, Performance measures, Estimating program runtimes, Task assignment & scheduling, Real time operating systems (RTOS), Task management, Race condition, Inter-task communication, Implementation aspects & estimation modeling in embedded systems, Validation & debugging of embedded systems, Real time communication, Hardware-software co-design in an embedded system, Applications of Real time systems.

References:

1. Krishna & Shin, Real -Time Systems, (McGraw Hill International)
2. Rajkamal, Embedded systems, (Tata - McGraw Hill)
3. Valvano, Embedded Microcomputer systems, (Thomson Delmar publishing)
4. Atmel/ARM Data books.
5. Iyer &Gupta, Embedded Real Time Systems Programming, (Tata McGraw Hill)
6. Lewis Daniel, Fundamentals of Embedded software, (Prentice Hall India)
7. Jane Liu, Real Time Systems, (Pearson India low cost edition)

NORTH MAHARASHTRA UNIVERSITY JALGAON
M.E. ELECTRONICS AND TELECOMMUNICATION (Digital Electronics)
W.E.F : 2010-11

Term – I I

MICROELECTRONICS CIRCUIT DESIGN

Teaching scheme:
Lectures: 3 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)

Types of modeling, Models of diode, BJT and FET, CMOS device modeling: Simple MOS Large-signal Model, Simple MOS Small-signal Model,
Analog IC Design : Differential Amplifier, Cascode Amplifer, Current Amplifiers, Output Amplifers, High gain amplifier Architecture,
Operation Amplifier Design of CMOS op-amp, Compensatio of op-amps,
Design of two stage op-amps, PSRR of two stage op-amps, Cascode op-amps, Simulation and Measurement of Op-amps, Micromodels of Op-amps, Switch Capacitor Circuits, Switch Capacitor Amplifiers, Switch Capacitor Integrator, z Domain Models of two phase switched capacitor circuits, First and Second order switched capacitor circuits, Switched capacitor filter.
High frequency amplifier, Mixer, R.F. Power amplifier, Phase- Locked Loops.

References:

1) Phillip E. Allen and Douglas R. Holberg, CMOS Analog Circuit Design,2nd ed. New York : Oxford University Press, 2004
2) Thomas H. Lee, "The Design of CMOS Radio – Frequency Integrated Circuit", Cambridge University Press
3) B. Razavi "RF Microelectronics" PHI 1998
4) R. Jacob Baker, H.W. Li, D.E. Boyce " CMOS Circiut Design, layout and Simulation"
PHI 1998
5) Y.P. Tsividis "Mixed Analog and Digital Devices and Technology" TMH 1996

Term – I I

ADVANCE COMPUTER NETWORK

Teaching scheme:
Lectures: 3 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)

Review of computer networking concepts

Topology, LAN, WAN, MAN, Internet, OSI/ISO, TCP/IP reference models, Point to point protocols. ARQ: Retransmission strategies. Functional elements : Multiplexing, Switching , Networks Management & traffic controls. Delay models in Data Networks Switching techniques: Performance measures & architectural issues.

Internetworking

TCP/IP Internet architecture, IPV4, IPV6, IP addressing & related issues, IP address resolution techniques (ARP). IP datagram & forwarding, routing algorithms.

Multiple access techniques

ALOHA, CSMA, CSMA/CD, CSMA/CA, CDMA, OFDM, Delay throughput characteristics, WLAN-Protocols, multiple access, Ad-hoc networks, Bluetooth Specifications, WAP.

Network security issues

Ciphers, DES, Public key cryptography, RAS algorithm, Digital Watermarking, Attacks and Counter Measures , Service Authentication Performa.

References:

1) Dimitri Bertisekas & Robert Gallager, “Data Networks” PHI
2) Gerd E Kieser, “Local Area Networks”,– Mc-Graw-Hill
3) D.E.Comer, “Computer Networks and Internetworking” Pearson Education
4) William Stallings, “Cryptography and Network Security: Principles and Practice”, Pearson Education
5) Steele, “GSM, CDMA and 3G Systems” , Wiely Students Edition
6) Anurag kumar, D. Manjunath & Joy Kuri– Morgn, “Communication Networking” An analytical approach” – Kaufmann publishers

Term – II

Elective - II

ADVANCED DIGITAL COMMUNICATION

Teaching scheme:
Lectures: 3 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)

Signal spectra & Random Processes:
Basics of Fourier series & Fourier transform, Probability, Random Variables and processes, Digital PAM & PAM formats, Line coding spectral representation, AT & T and CCITT hierarchies.

Digital CW modulation an overview, BPSK, DPSK, DEPSK, OPSK, M'ary PSK, QASK constellation pattern, BFSK, GMSK, Doubinary encoding, QPR coherent & non coherent systems, Bandwidth & spectrum representation, error probabilities in BPSK, DPSK, QPSK, FSK, 16 QAM, MSK, their performance evaluation in presence of AWGN.

Matched correlation, optimum filters, Integrate & Dump, their transfer function, error probabilities, error rate etc.

Spread spectrum techniques: DS, FH, CDMA based system, Performance of DS-SS & FH-SS, generation of PN sequence code.

Error Control Coding**:** Introduction to algebra**,** Group rings, Galois field, two arithmetic GF, Linear block codes: Structure matrix description, Syndrome decoding, Hamming codes, Perfect & Quest, perfect odes, Cyclic codes: Polynomial description, division algorithm, matrix description, fire codes, golay codes, cyclic Redundancy check codes, circuit implementation of cyclic codes.

Encoding and Decoding of BCH and RS codes, MDS Codes, Nested codes, Convolutional Encoders, Tree & Trellis diagram, Veterbi decoding algorithms, Sequential decoding algorithms.

References :

1. J. G. Prokais, "Digital Communications", McGraw Hill Inc.
2. Bernad Sklar, "Digital Communication: Fundamentals & Applications", Pearson Education Asia (LPE).
3. A. B. Carlson, "Communication System", Mc Graw Hill Inc.
4. Amitabh Bhattacharya, "Digital Communication", TMH.

5. T. S. Rappaport, “Wireless Communication”, Pearson Education.
6. Simon Haykin, “Digital Communications”, John Wiley & Sons
7. Taub &Schilling, “Principle of Communication System”, TMH.

Elective - II

ARTIFICIAL INTELLIGENCE

Teaching scheme:
Lectures: 3 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)

Fuzzy Logic Introduction to Fuzzy sets, Fuzzy set Theory, Fuzzy relation, Membership functions, fuzzification, defuzzification, fuzzy rule based system fuzzy inference system.

Fuzzy Decision Making, Fuzzy modeling, Fuzzy reasoning, compositional rules of inference, Fuzzy systems as function estimators, Fuzziness as multivalence, Adaptive neuro fuzzy inference system, cognitive neurofuzzy modelling, Neuro fuzzy control, Application of neuro fuzzy control

Neural Network Fundamental of Artificial Neural Network : Artificial Neuron model. Learning process, Single layer and multilayer feed forward network, training by back propagation, Hop-field model basic concept of
Bidirectional associative memory, self organization map, optimization model.
Recurrent Networks, Hamming Net and MAXNET, Feature mapping, counter propagation networks, cluster discovery Network (ART),
Applications of Neural Network Characters Recognition Network, Neural Network control Application, Network for Robot kinematics, Hand written Numeral recognition.

References:

1 Limin Fu , “Neural Networks in Computer Intelligence”, McGraw Hill Inc., 1994.
2 N. K. Bose, P. Lling , “Neural Network Fundamentals”, McGraw Hill.
3 Zurada “Artificial Neural Networks”,
4 Timothy J. Ross , “ Fuzzy Logic with Engg. Applications”, McGraw Hill.
5 Jang, Sun, Mezutani “Neuro Fuzzy and Soft computing”, TMH
6 Bart Kasko, “Fuzzy Engineering”, PHI
7 S. Hykin , “Neural Networks”, Pearson Education.
8 J.A.Freeman and B.M.Skapure, “Neural Networks, Algorithms Applications and programming Techniques”, Addison – Wesely, 1990
9 Laurence Fausett, “Fundamental of Nerual Networks: Architecture, algorithms and application”,Prentice Hall, 1994.

NORTH MAHARASHTRA UNIVERSITY JALGAON
M.E. ELECTRONICS AND TELECOMMUNICATION (Digital Electronics)
W.E.F : 2010-11
Term – II

Elective - II

Modeling and Simulation Techniques

Teaching scheme:
Lectures: 3 hrs / week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)

Introduction Models and their applications, Common types of mathematical models used for engineering systems, Derivation of models from physical relations, Model determination from input- output observation, Basic principle of simulation, Analog and digital simulation techniques, Models: Structural, Process, Continuous, Discrete, Deterministic,Random, input/output, static, dynamic, multilevel.

Classical and Semi-classical models:
Boltzmann transport equation, classical semiconductor equations- drift diffusion approximation, generation and recombinations, different generation and recombination mechanisms, limitations of drift-diffusions, energy transport, semiclassical and hot electron models, hydrodynamic and semi-classical semiconductor equations, modeling of semiconductor laser diode, general aspects, static models and dynamic models, model verification and validation.

Numerical Techniques: Finite difference methods, first order and second order derivatives and discrimination, finite element method, solution of poison's equation, solution of steady state continuity equation for electrons and holes, advantages and disadvantages of finite element method, Monte Carlo simulation techniques, basic concepts, Random variables, random number generation and testing, analysis of simulation results, confidence intervals, variance reduction techniques. Case studies of analytical and simulation studies

Modeling of Semiconductor Devices p-n junction, p-n junction C-V characteristics, breakdown, Schottky diodes, Hetero-structure diodes, Simulation of above device characteristics in graphical format, Simulation of simple laser diode and plot its characteristics by considering appropriate materials and parameters, PIN diode, Avalanche Photodiode, Quantum transport modeling, 1D models, discretized Schrodinger equation, Transmission matrix formation, I-V characteristics.

Universal FET modeling
sub threshold regime, unified charge control model, short channel effects, I-V modeling.Capacitance modeling (Ward Dutton and Meyer models) Universal models for MOSFET,MESFET, HFET and TFT.

References:

1. Modeling of CMOS G.Gordon, 'System Simulation', 2nd ed., Prentice Hall
2. Narsing Deo, 'System Simulation with Digital Computers', Prentice Hall
3. R. Leigh, 'Modelling and Simulation', Peter Peregrims Ltd.,. 1983.
4. M.Law, W.D.Kelton, 'Simulation Modelling and Analysis, Mcgraw Hill, 1982.
5. Raj Jain, The Art of Computer Systems Performance Analysis, John Wiley and Sons, New York, USA, 1991
6. Trivedi, K.S, Probability and Statistics with Reliability, Queueing and computer science Applications, Prentice Hall of India, Reprinted in 1990.

NORTH MAHARASHTRA UNIVERSITY, JALGAON (M.S.)

MASTER OF ENGINEERING (M.E.)

(MECHANICAL ENGINEERING)
(MACHINE DESIGN)

W.E.F.: 2010-11

North Maharashtra University, Jalgaon
M.E. (Machine Design)
Examination scheme and Structure with effect from Year 2010-11
First Year Term I

Sr No	Subject	Teaching Scheme per week		Examination Scheme				
		L	P	Paper Hr.	Paper	TW	PR	OR
1	Advanced Mechanical Engineering Design of Equipment	3	-	3	100	-	-	-
2	Computer Methods in Mechanical Design	3	-	3	100	-	-	-
3	Vibration Engineering	3	-	3	100	-	-	-
4	Tribology	3	-	3	100	-	-	-
5	Elective-I	3	-	3	100	-	-	-
6	Laboratory Practice-I	-	6	-	-	100	-	50
7	Seminar-I	-	4	-	-	100	-	-
	Total	15	10		500	200		50
	Grand Total	25		750				

Elective I

1) Design of Pressure Vessel
2) Instrumentation and Automatic Control System
3) Design of Material Handling Equipment

First Year Term II

Sr No	Subject	Teaching Scheme per week		Examination Scheme				
		L	P	Paper Hr.	Paper	TW	PR	OR
1	Design and synthesis of Mechanism	3	-	3	100	-	-	-
2	Optimization Techniques in Design	3	-	3	100	-	-	-
3	Machine Tool Design	3	-	3	100	-	-	-
4	Mechatronic Product Design	3	-	3	100	-	-	-
5	Elective-II	3	-	3	100	-	-	-
6	Laboratory Practice-II	-	6	-	-	100	-	50
7	Seminar-II	-	4	-	-	100	-	-
	Total	15	10		500	200		50
	Grand Total	25		750				

Elective II

1) Automotive Design
2) Robotics
3) Design for Manufacture and Assembly

Second Year Term I

Sr No	Subject	Teaching Scheme per week		Examination Scheme				
		L	P	Paper Hr.	Paper	TW	PR	OR
1	Seminar-III	-	4	-	-	50	-	50
2	Project Stage-I	-	18	-	-	100	-	-
	Total	-	22	-	-	150		50
	Grand Total	22		200				

Second Year Term II

Sr No	Subject	Teaching Scheme per week		Examination Scheme				
		L	P	Paper Hr.	Paper	TW	PR	OR
1	Progress Seminar	-	-	-	-	50	-	-
2	Project Stage-II	-	18	-	-	150	-	100
	Total	-	18	-	-	200	-	100
	Grand Total	18		300				

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM I
ADVANCED MECHANICAL ENGINEERING DESIGN OF EQUIPMENT

Exam Scheme :

Lectures – 03 hours/week.

Theory – 100 marks
Min passing – 40 marks
Duration – 3 Hours

Material selection in Mechanical design: - Design process, Engineering material and their properties, Material property charts, material selection procedure and case studies, Process selection procedure & case studies, Multiple constraints & objectives, selection of shape, designing hybrid materials.

Advanced Design: - Load analysis for two & three dimensional static, dynamic and vibrating loading, Deflection in beam, Castigliano's method, Torsion, Combined stress, Stress concentration, Failure theories, Von Mises – Hencky theory, Fracture mechanics, fatigue failure mechanism & models, Notches & stress concentration, Residual stress, design for high cycle fatigue, design for fully reversed uniaxial stress, Design for fluctuating uniaxial stress, Design for multiaxial stress

Reference:

1) Machine Design By Robert L Norton
2) Mechanical Engineering Design By J.E.Shigley & C R Mischke
3) Selection of engineering material by Gladius Levis

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM I
COMPUTER METHODS IN MECHANICAL DESIGN

Exam Scheme :

Lectures – 03 hours/week.

Theory – 100 marks
Min passing – 40 marks
Duration – 3 Hours

Advanced Computer Graphics: - review of 2D & 3D geometric transformation, Modeling of curves, cubics, splines, beziers and b-splines, Modelling of surface, modeling of solids, brep, CSG, octree, feature based modeling, Windowing and view porting
Finite Element Analysis : - Principle of potential energy, 1D elements, Derivation of stiffness & mass matrices for a bar, beam and shaft, solution for static problems,
Case studies in stress analysis of mechanical components, FEA using 2D & 3D elements, plain strain & stress problems, FEA using plate & shell, Finite element mesh, Automatic meshing technique, case studies using FE for design of geometrics such as tapered bar, plate with hole, spanner etc. Introduction to dynamic analysis, Basic equation,undamped free vibration, damping, Harmonic response analysis, thermal problem, formulation procedure, 1D & 2D heat transfer problems.

Reference:

1) Introduction to finite element method by C S Desai & J.F Abel
2) Concept & application of finite Element Analysis by Robert Cook
3) CAD/CAM by Groover & Zimmer

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM I
VIBRATION ENGINEERING

Exam Scheme :

Lectures – 03 hours/week.

Theory – 100 marks
Min passing – 40 marks
Duration – 3 Hours

Introduction to vibration , free vibration and forced response solution of single and multiple degree freedom, of numerical method of finding natural frequencies and mode shape , vibration instrumentation ,vibration design and control, vibration isolation , passive control of , vibration absorber , active control of vibration , whole body vibration perception ,health effect of whole body vibration, motion sickness .

Reference:

1.Engineering vibration By Daniel .J. Inman
2.Mecanical vibration control engineering By S.Rao
3.Noise &vibration control engineering By Ver Beranek

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM I
TRIBOLOGY

Exam Scheme :

Lectures – 03 hours/week.

Theory – 100 marks
Min passing – 40 marks
Duration – 3 Hours

Friction & Wear : -Types of wear ,theories of friction & wear, dry friction & boundary friction

Viscosity:- Petroff's law, Hagen Poisenille law, variation of viscosity ,

Hydrodynamic Lubrication: - Reynold's Eq. Solution for short & long finite bearing, load carrying capacity, flow rate, hydrodynamic thrust bearing, behaviour under variable laod, squeeze film, thermal equilibrium of sliding system, elasto hydrodynamic lubrication

Hydrostatic Lubrication: -Pressure distribution in hydrostatic thrust bearing, pumping power & capacity, hydrostatic formal & thrust bearing

Gas Lubrication: -Merits & Demerits, aerodynamic and aerostatic journal bearing ,Reynolds equation.

Reference:

1) Principles of tribology by J.Hamrock
2) Tribology in machine Design by T A solarski
3) Principles of Tribology by J.Hasting

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM I
ELECTIVE – I
DESIGN OF PRESSURE VESSEL

Exam Scheme :

Lectures – 03 hours/week.

Theory – 100 marks
Min passing – 40 marks
Duration – 3 Hours

Introduction: Revision of stress and strain in thick and thin cylinder and pressure vessel. Criteria in vessel design, excessive elastic deformation, plastic instability, brittle, rupture, creep

Design of pressure vessel, internal pressure, construction feature, code, design of shell, types of heads, thickness of heads.

Design of storage vessel, storage of non volatile liquids and gases, code for storage, bottom and shell design

Design of vessel under external pressure, vacuum stress analysis, stiffness , design of circumferential stiffeners, design of covers, pipes and tubing

Design of High Pressure Vessel, autoclave

Support for vessel, types, leg support skirt, support design.

Reference:

1) Process Equipment Design by N.V .Joshi
2) Process equipment design by L.E.Browr ,E.H.Yovng
3) Introduction to process Equipment Design by B.C. Bhattacharya

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM I
ELECTIVE – I
INSTRUMENTATION AND AUTOMATIC CONTROL SYSTEM

Exam Scheme :

Lectures – 03 hours/week.

Theory – 100 marks
Min passing – 40 marks
Duration – 3 Hours

Classification and representation of control systems,Influence of type control on steady state and transient responce,Time and frequency domain analysis,Stability analysis using Rough Phi Nyquist criteria,Root locus method,Modern control theory,Sequence control and programmable logic controllers,Control components,Comparators,Hydraulie,Neumatic and Electrical type of controllers,Servomotors.

Computer bvased data aquisition system,A-D and D-A convertors,Microprocessor application in measurement and control,Static and dynamic analysis of instrument system,FFT analysers,Current development in measurement and control of motion ,Force torque,pressure,temperature,floe,noice

Reference:

1.Measurement System By Ernest O Josbelin
2.Modern Control Systems ByRichard C Dorf, Robert H Bishop

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM I
ELECTIVE – I

DESIGN OF MATERIAL HANDLING EQUIPMENT

Exam Scheme :

Lectures – 03 hours/week.

Theory – 100 marks
Min passing – 40 marks
Duration – 3 Hours

Introduction to material handling equipment, interplant transporting facilities, types of equipment,
Working principle, Construction and Design of: - Flexible hoisting application, pulley system,load handling equipment, arresting gears,hoisting gears,traveling gears, luffing gear,various types of drives, crane frame structure, stability of crane, elevators, electromagnetic hoisting equipment, various types of conveyors .

Reference:

1) Material handling equipment by Rudenko
2) Material handling equipment by John R Immer

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM I
LABORATORY PRACTICE - I

Exam Scheme :

Practical's – 06 hours/week. Term-work – 100 marks
Oral- 50 marks

Experiments/Assignments based on

1) Computer Methods in Mechanical Design
2) Vibration Engineering
3) Tribology

The concerned subject in-charge should frame minimum of six laboratory Experiments / Assignments, two from each subject.

Note: Oral will be based on the prescribed term-work presented in the form of certified journal.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM I
SEMINAR-I

Practical's – 06 hours/week. Term-work – 100 marks

Seminar-I should be based on the literature survey on any topic relevant to Design Engineering. It may be leading to selection of a suitable topic of dissertation. Each student has to prepare a write-up of about 25 pages. The report typed on A4 sized sheets and bound in the necessary format should be submitted after approved by the guide and endorsement of the Head of Department. The student has to deliver a seminar talk in front of the teachers of the department and his classmates. The Guide based on the quality of work and preparation and understanding of the candidate shall do an assessment of the seminar

The report copies must be duly signed by the guide and Head of department (one copy for institute, one copy for guide and one copy for the candidate for certification). Attendance of all students for all seminars is compulsory

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM II
DESIGN & SYNTHESIS OF MECHANISM

Exam Scheme :

Lectures – 03 hours/week.

Theory – 100 marks
Min passing – 40 marks
Duration – 3 Hours

Kinematics analysis of planer mechanism, graphical & analytical methods of velocity & acceleration analysis

Curvature Theorem, fixed & moving centroids, inflection circle, Euler Savary equation, Bobillier construction, cubic & stationary curvature, dwell mechanism

Kinematic synthesis, Dimensional synthesis, function generation, path generation, accuracy point, Chebychev spacing, graphical synthesis for function generation with two, three, four accuracy points, Bermester points

Analytical Synthesis of four bar and slider crank mechanism, Frendenstein equation.

Coupler Curves: - Equation of coupler curves, Robber Chebychev theorem, kinematics analysis of spatial mechanism, Denavit Hartenberg parameters, matrix method.

Reference:

1) Design of Machaniry- An introduction to synthesis & analysis of mechanics & machines by R.L.Norton
2) Mechanism Design - Analysis & synthesis by A.G.Edman & G.N.Sandor
3) Theory of Mechanics & Mechanism by J.E.Shigley & J.J.Ucker

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM II
OPTIMIZATION TECHNIQUES IN DESIGN

Exam Scheme :

Lectures – 03 hours/week.

Theory – 100 marks
Min passing – 40 marks
Duration – 3 Hours

Optimum design formulation,Problem formulation process;Graphical optimisation;optimum design concepts,Global and local minima,Unconstrained optimum design problems,Constrined optimum design problems,Postoptinality analysis,Linear programming methods for optimum design numerical methods for unconstrined optimisation,Numerical method for constrained optimisation;Multiobjective optimum design concepts and methods,Genetic algorithms,Weighted sum method,Weighted minimum-maximum method;Global optimisation concepts and methods for optimum design,Deterministic method,Stochontic method

Reference:

1.Mechanical design of mechanical element-R.C.Thomson
2.Optimisation concept and application in engineering-Balegundu & Chandrupatla
3.Engineering optimisation-S.S.Rao

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM II
MACHINE TOOL DESIGN

Exam Scheme :

Lectures – 03 hours/week.

Theory – 100 marks
Min passing – 40 marks
Duration – 3 Hours

Introduction, trends in machine tool design, design specification, working principle,
Kinematics of machine tool, different drives, cutting speeds, gear boxes, ray diagram,
Force analysis, forces for different machining operation, design of beds, columns, tables, support, rigidity consideration,
Vibration in machine tool, vibration of column beds, vibration damping,
Design of side ways & guide ways, types of guide, pressure distribution, wear, accuracy, lubrication .
Design of power screws, design features, strength, rigidity, efficiency, backlash,
Design of spindles, balancing of spindles, strength & wear resistance,
CNC machine tool, CAD/CAM system, programming.

Reference:

1) Machine tool design by N.K.Mehta
2) Design principles of metal cutting—machine tool by F Koenigs Berger

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM II
MECHATRONIC PRODUCT DESIGN

Exam Scheme :

Lectures – 03 hours/week.

Theory – 100 marks
Min passing – 40 marks
Duration – 3 Hours

Introduction to mechanical system, principles of basic electronics, microprocessor and their application, integrated, circuits, sensors, actuators, other electrical / electronic hardware in mechatronic system communication .

Interfacing DA & AD converters, software and hardware principles and tools to build mechatronic system. Design and selection of mechatronic elements namely sensors like encoders and resolvers stepper and servomotor.

Role of controls in mechatroincs role of modeling in mechatronics design, design optimizations of mechatronics systems.System interface, Data acquisition, Instrumentation system.

Reference:

1) Mechatronics by W. Bolton
2) Mechatronics System Design by Shetty D and Kolk R. A.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM II
ELECTIVE – II
AUTOMOTIVE DESIGN

Exam Scheme :

Lectures – 03 hours/week.

Theory – 100 marks
Min passing – 40 marks
Duration – 3 Hours

Design requirements of automobile, engines as a system and its subsystem, lubrication system, fuel injection system, cooling system. Design requirements of automobile transmission, automatic transmission; Dynamic consideration in designing of suspension system, modern system of suspension, kinematic requirements of steering mechanism, need for power steering, braking requirements of automobile. Brake materials, modeling and simulation of different subsystems, instrumentation and control, microprocessor controlled units, safety and comfort in automotive component design.

Reference:

1) Design of Machinery By Robert L Norton
2) Machine Component Design By Willian Orthweein.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM II
ELECTIVE – II
ROBOTICS

Exam Scheme :
Lectures – 03 hours/week.

Theory – 100 marks
Min passing – 40 marks
Duration – 3 Hours

Introduction: - Historical perspective, advantage, application
Basic component: -Manipulator sensory devices, controller, power conversion unit
Mechanical system: - translation & linear motion, motion conversion, modeling kinetic chain, end effectors
Control of actuator: - Closed loop control, control of robotics joint, stepper motor, direct drive, hydraulic actuator
Sensory devices: - Non-optical position sensor, optical position sensor, velocity sensor, accelarometer, proximity sensors, touch & slip sensor
Vision of robotics system: - Imaging component, picture coding, object recognition
Computer: -Hardware & software

Reference:
1) Robotics engineering by Richard Klafter
2) Robotics for Engineer by Yoram Korem
3) Robot Control by spong, lewis, Abdallah

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM II
ELECTIVE – II

DESIGN FOR MANUFACTURE AND ASSEMBLY

Exam Scheme :

Lectures – 03 hours/week.

Theory – 100 marks
Min passing – 40 marks
Duration – 3 Hours

Life cycle of mechanical equipment design, Requirement of life cycle personnel like customer, management, marketing, manufacturing, transportation etc. Need to meet constraints of manufacturing, Advantages of designing for manufacturing and assembly to improve product quality, cost and time to market, Design for manufacture & assembly (DFMA) strategies, DFMA application and case studies, product design for manual assembly, Design for high speed automatic & robot assembly, design for machining, design for injection moulding, die casting and powder metal processing, Design for sheet metal for mechanical system design

Reference:

1) Process and Design for manufacturing by Sherif D EL Wakil
2) Manufacturing, Planning and control systems by Thomas E Vollmann, Willam L Beroy
3) Automation, Production System and Computer Integrated Manufacturing by Mikell P Groover.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM II
LABORATORY PRACTICE - II

Exam Scheme :

Practical's – 06 hours/week. Term-work – 100 marks
Oral- 50 marks

Experiments/Assignments based on

1) Mechatronic Product Design
2) Design and Synthesis of Mechanism
3) Optimization Techniques in Design

The concerned subject in-charge should frame minimum of six laboratory Experiments / Assignments, two from each subject.

Note: Oral will be based on the prescribed term-work presented in the form of certified journal.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
FIRST YEAR TERM II
SEMINAR-II

Exam Scheme :
Practical's – 06 hours/week. Term-work – 100 marks

Seminar-II should be based on the literature survey on any topic relevant to Design Engineering. It may be leading to selection of a suitable topic of dissertation. Each student has to prepare a write-up of about 25 pages. The report typed on A4 sized sheets and bound in the necessary format should be submitted after approved by the guide and endorsement of the Head of Department. The student has to deliver a seminar talk in front of the teachers of the department and his classmates. The Guide based on the quality of work and preparation and understanding of the candidate shall do an assessment of the seminar

The report copies must be duly signed by the guide and Head of department (one copy for institute, one copy for guide and one copy for the candidate for certification). Attendance of all students for all seminars is compulsory

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
SECOND YEAR TERM I
SEMINAR-III

Exam Scheme :

Practical's – 04 hours/week. Term-work – 50 marks
Oral – 50 marks

Seminar - III should be based on the literature survey on any topic relevant to Design Engineering. It may be leading to selection of a suitable topic of dissertation. The report shall contain some contribution by the candidate in the form of experimental results, deductions, compilation and inferences etc.

Each student has to prepare a write-up of about 25 pages. The report typed on A4 sized sheets and bound in the necessary format should be submitted after approved by the guide and endorsement of the Head of Department. The student has to deliver a seminar talk in front of the teachers of the department and his classmates. The Guide based on the quality of work and preparation and understanding of the candidate shall do an assessment of the seminar.

The report copies must be duly signed by the guide and Head of department (one copy for institute, one copy for guide and one copy for the candidate for certification). Attendance of all students for all seminars is compulsory

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
SECOND YEAR TERM I
PROJECT STAGE - I

Exam Scheme :
Practical's – 18 hours/week. Term-work – 100 marks

The candidate shall submit the synopsis of the dissertation work to the evaluation committee at the starting of FIRST YEAR TERM III.

It shall include the problem definition, literature survey, approaches for handling the problem, finalizing the methodology for the dissertation work and design calculations / experimental design etc.

A report of the work shall be submitted at the end of Semester III after approval by the Guide and endorsement of the Head of Department. It will be assessed for term work, by the evaluation committee appointed by the Head of the Department, for appropriateness, sufficiency of contents and offer suggestions if any.

The candidate shall prepare a report of about 50 pages. The report typed on A4 sized sheets and bound in the prescribed format shall be submitted after approval by the Guide and endorsement of the Head of Department. It will be assessed for term work by the evaluation committee appointed by the Head of the Department.

The report copies must be duly signed by the guide and Head of department (one copy for institute, one copy for guide and one copy for the candidate for certification). Attendance of all students for all seminars is compulsory

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
SECOND YEAR TERM II
PROGRESS SEMINAR

Exam Scheme :
Practical's – 04 hours/week. Term-work – 50 marks

Progress Seminar shall be based on topic of the Dissertation Work. It may include literature review, required theoretical input, study and comparison of various approaches for the proposed dissertation work. The candidate shall prepare a report of about 25 pages. The report typed on A4 sized sheets and bound in the prescribed format shall be submitted after approval by the Guide and endorsement of the Head of Department. It will be assessed for term work by the evaluation committee appointed by the Head of the Department.

The report copies must be duly signed by the guide and Head of department (one copy for institute, one copy for guide and one copy for the candidate for certification). Attendance of all students for all seminars is compulsory

NORTH MAHARASHTRA UNIVERSITY, JALGAON
M.E. (MACHINE DESIGN)
W.E.F.: 2010-11
SECOND YEAR TERM II
PROJECT STAGE - II

Exam Scheme :
Practical's – 18 hours/week. Term-work – 100 marks

The candidate shall submit the detailed report as per the synopsis approved by the evaluation committee, of the dissertation work in the prescribed format after approval by the Guide and endorsement by the Head of the Department. It will be assessed for term work by the evaluation committee appointed by the Head of the Department, for completion of the proposed work.

Note: - The evaluation committee shall consist of the Guide, one senior expert faculty member and the Head of the Department or his/her representative.

Rules and Regulations for M.E. in ((Machine Design):-

1.The post graduate degree in engineering consisting of 2 years (4 terms) shall be designated as Master of Engineering in Mechanical Engineering.
2. A candidate may be permitted to register him/her self for the M.E. degree in (Machine Designing) under the faculty of engineering & technology of North Maharashtra University, Jalgaon only if the candidate holds a bachelor's degree in Engineering & technology of North Maharashtra University, Jalgaon or its equivalent in Appropriate/Allied branch, recognized by AICTE/UGC & North Maharashtra University, Jalgaon.
3. The student shall be admitted to First Year Term II if his/her Term I is granted.
4. The student shall be admitted to the Second Year when ever he/she clears all the theory papers of First Year. The student in any case should not be allowed to start project work before passing all the subjects of first year. The student will have to work on his/her project for minimum one year after passing first year subjects. He/she will not be allowed to submit his/her thesis/dissertation before that.
5. Every student will be required to produce a record of laboratory work in the form of journal, duly certified for satisfactory completion of the term work by the concerned teacher & head of the department.
6. A student whose term is not granted on account of less attendance (Minimum 75%) or non-submission of term work is required to repeat the term.
7. Any approved guide will not be allowed to guide more than 5 students in a particular batch.
8. Each student is required to present Seminar-I in the First Year Term I on any related state of the art topic of his own choice approved by the department.
9. The term-work & presentation of the Seminar-I will be evaluated by departmental committee consisting of guide and two faculty members of the department appointed by Director/Principal of the college as per the recommendation of the Head of the Department.
10. Each student is required to present Seminar-II in the First Year Term II on any related state of the art topic of his own choice approved by the department.
11. The term-work & presentation of the Seminar-II will be evaluated by the departmental committee consisting of guide and two faculty members of the department appointed by Director/Principal of the college as per the recommendation of the Head of the Department.
12. Each student is required to present Seminar-III in the Second Year Term I on special topic. The topic should be on any of the area not included in the regular curriculum. The report should include detailed study of specific concept (i.e. analysis, design & implementation). This can be a theoretical study or practical implementation approved by the department/guide.
13. Guidelines for the dissertation Seminar-III in Second Year Term-I:

1. Seminar-III should be conducted at the end of Second Year Term I.
2. The term-work of the Seminar-III will be evaluated by departmental committee consisting of guide & two faculty members of the department appointed by Director/Principal of the college as per the recommendation of the Head of the Department.
3. Seminar-III presentation will be evaluated by examiners appointed by University, one of which should be guide.
4. Student must submit the Seminar Report in the form of soft bound copy.

5. The marks of Seminar-III should be submitted at the end of Second Year Term I to the University.

14. Guidelines for the Progress Seminar in Second Year Term-II:
    1. Progress seminar should be conducted in the middle of Second Year Term-II.
    2. The Progress Seminar Term-Work will be evaluated by departmental committee consisting of guide and two faculty members of the department appointed by Director/Principal of the college as per the recommendation of the Head of the Department.
    3. Student must submit the Progress Report in the form of soft bound copy.
    4. The marks of Progress Seminar should be submitted along with the marks of Project Stage-II.

15. Minimum passing marks for all Theory shall be 40% and for Term-Work and Oral shall be 50%.
16. He/she has to present/publish at least one paper in reputed National/International Journal/Conference on his/her Project work before submission of his/her Thesis/Dissertation.
17. The Term-Work of Project Stage-II will be assessed jointly by the pair of Internal & External examiner along with oral examination of the same.
18. The class will be awarded on the basis of aggregate marks of all four terms, giving equal weightage to all terms as shown below:
    a) Less than 50% : Fail
    b) 50% to less than 60% : Second Class
    c) 60% to less than 70% : First Class
    d) 70% & above : First Class with Distinction.

19. Each student is required to complete his/her master's degree within Five academic years from the date of admission, failing which he/she will be required to take fresh admission in first year.

SSBT'S COLLEGE OF ENGINEERING & TECHNOLOGY, BAMBHORI.
DEPARTMENT OF APPLIED SCINCE
TEACHING LOAD DISTRIBUTION FOR SEMESTER- I YEAR 2012-2013

Sr.No	Name	Year and Branch	Subject	Th (Hr)	Practical Batch X Hr	Titorial (Hr)	Total
1	Dr.Panigrahi	F.E.	EM-I	3	-	5	14
		S.E (Comp-B)	EM-III	4	-	2	
2	K.S.Patil	F.E	EP-I	9	09X1=09	-	18
3	S.S.Patil	F.E.	EM-I	6	-	5	20
		S.E(Civil, Chem/BT)	EM-III	8	-	1	
4	Y.K.Chitte	F.E	SOFT SKILL	3	1X2=2	-	5
5	C.U.Nikam	F.E	EP-I	9	09X1=09	-	20
			EVS	2			
6	M.V.Deshpande	F.E.	EM-I	6	-	4	20
		S.E (Comp-A,IT))	EM-III	8	-	2	
7	D.I.Desai	F.E	EC-I	9	09X1=09	-	20
			EVS	2			
8	J.J.Patil	F.E.	EM-I	6	-	5	21
		S.E(Mech-B, Ele)	EM-III	8	-	2	
9	M.B.Patil	F.E	EP-I	9	09X1=09	-	20
			EVS	2			
10	N.B.Bhoi	F.E	SOFT SKILL	7	6X2=12	-	19
11	A.R.Mali	F.E	EC-I	9	09X1=09	-	20
			EVS	2			
12	U.T.Patil	F.E	EC-I	9	09X1=09	-	19
			EVS	1			
13	A.Ansari	F.E.	EM-I	6	-	8	21
		S.E (Mech-A)	EM-III	4	-	3	
14	J.B.Patil	F.E	SOFT SKILL	0	7X2=14	-	14
						Total load =	251

Time table incharge **HOD (Applied Science)**

SSBT'S COLLEGE OF ENGINEERING & TECHNOLOGY, BAMBHORI.
DEPARTMENT OF APPLIED SCINCE
TEACHING LOAD DISTRIBUTION FOR SEMESTER- II YEAR 2012-2013

Sr. No	Name	Year and Branch	Subject	Th. (Hr)	Practical Batch X Hr	Tutorial (Hr)	Total
1	Dr.Panigrahi	S.E (E&TC-A &B)	EM-III	8	-	2	10
2	K.S.Patil	F.E	EP-II	9	12	-	21
3	S.S.Patil	F.E.	EM-II	8	-	5	13
4	C.U.Nikam	F.E	EP-II	12	6	-	20
			EVS	2	-	-	
5	M.V.Deshpande	F.E.	EM-II	8	-	6	14
6	D.I.Desai	F.E	EC-II	12	6	-	20
			EVS	2	-	-	
7	J.J.Patil	F.E.	EM-II	8	-	7	15
8	M.B.Patil	F.E	EP-II	9	12	-	23
			EVS	2	-	-	
9	N.B.Bhoi	F.E	SOFT SKILL	10	10	-	20
10	A.R.Mali	F.E	EC-II	9	12	-	23
			EVS	2	-	-	
11	U.T.Patil	F.E	EC-II	9	12	-	23
			EVS	2	-	-	
12	A.Ansari	F.E.	EM-II	4	-	3	15
		S.E (BT& E&TC)	EM-III	4	-	2(BT), 2(E&TC)	
13	M.T.Shirude	F.E	EM-II	12		1	13
14	Jaysing Raul	F.E	SOFT SKILL		20		20
						Total load =	250

NOTE: 1) Evs Load 6 Hr. For SE (Direct) Students given to Jyoti Mali Mam (Civil Dept) in zero hours

Time 3.45-4.45 pm for IT,ELE,CHEM,BT & 10-11 am for E& TC, COMP, MECH,CIVIL

2)Soft Skill Load (2 Hours per week) is distributed to the Inter departmental Faculty which is given in enclosed sheet.

Time table incharge **HOD (Applied Science)**

DEPARTMENT OF BIOTECHNOLOGY, SSBT's, COET, BAMBHORI, JALGAON

TEACHING LOAD DISTRIBUTION

ACADEMIC YEAR: 2012-2013 (SEMESTER I)

SR.NO.	NAME	DESIGNATION	YEAR	SUBJECT	TH (Hrs)	PR BATCH X (Hrs)	TOTAL
1	Dr.I.D.Patil	Prof. & HOD	SE	PCAL	04	02	14
			BE	Project & Seminar	--	04	
			ME(Env.)	Project	--	04	
2	Sharanappa A.	Lecturer	TE	BPP	04	--	20
			BE	BPE-I	04	--	
			BE	BPMS	04	04	
			BE	Project & Seminar	--	04	
3	Jayant P.P.	Lecturer	SE	CA	--	02	16
			TE	ENZ	04	--	
			BE	FBT-II	04		
			BE	BSP	04	--	
			BE	Project	--	02	
4	Mrs. S.S.Pawar	Assistant Prof.	SE	FFSH	04	--	16
			TE	MT-I	04	04	
			TE	CRE	04	--	
5	Ashwini P. Jatkar	Lecturer	SE	MB	04	04	20
			TE	MBGE	04	04	
			BE	FB(Elect-I)	04	--	
6	Payal A. Patil	Lecturer	SE	CB	04	--	14
			SE	FFSH	--	02	
			TE	CRE	--	04	
			BE	FBT-II	--	04	
TOTAL							**100**

Dr.I.D.Patil
HOD Biotech

DEPARTMENT OF BIOTECHNOLOGY

SSBT'S COLLEGE OF ENGINEERING & TECHNOLOGY, BAMBHORI.

TEACHING LOAD DISTRIBUTION FOR SEMESTER II

YEAR 2012-2013

SR.NO.	FACULTY NAME	DESIGNATION	YEAR	SUBJECT	TH (Hrs)	PR/TW BATCH X (Hrs)	TOTAL
1	Dr.I.D.Patil	Professor and Head	TE	MT-II	04	1X04	
			BE	Project	--	1X04	12
2	Sharanappa A	Lecturer	BE	BPEE	04	----	
			BE	BioInfo	04	1X04	
			BE	Project	--	04	16
3	Mr.Jayant P.P.	Lecturer	BE	BPE-II	04	04	
			BE	ELE-II	04	---	
			BE	Project	--	02	14
4	Mrs Sarika Pawar	Assistant Prof.	SE	PHT	04	1X02	
			TE	IPC	04	1X02	
			TE	MT-II	--	1X04	16
5	Ashwini Jatkar	Lecturer	SE	BCH	04	1X02	
			TE	BWT	---	1X04	
			TE	FBT-I	04	---	
			BE	BPEE	---	1X02	16
6	Payal Patil	Lecturer	SE	CHE	04	1X02	
			TE	BWT	04	1X04	
			TE	IPC	--	1X02	16
7	Sarwat Bano	Lecturer	SE	IMM	04	01X02	
			TE	BTH	04	02X02	14
					TOTAL		104

Dr.I.D.Patil

(HOD, BIOTECH DEPT)

LOAD DISTRIBUTION
CIVIL ENGINEERING DEPARTMENT
SEM-II 2012-2013

Sr No.	Name Of Staff	Year & Branch	Subject	TH	PR Batches*hours	Total
1	Dr. M. Husain	BE CIVIL	PW	0	12	12
2	Dr. S.L.Patil	SE CIVIL	EG	4	4*2	14
		BE CIVIL	PW		2	
3	Mr. S.B.Pawar	SE CIVIL	SUR II	4		12
			TOS I	1		
		TE CIVIL	TRE II	1		
			SDD II		1*4	
		BE CIVIL	PW		2	
4	Mr. P.A.Shirule	BE CIVIL	SDD III	4	1*4	22
			PW		14	
5	Mr. F.I.Chavan	SE CIVIL	FM I	5	2*2	15
		BE CIVIL	WRE II	2		
			PW	4		
6	Mrs. Sonali Patil	SE CIVIL	FM I	1		15
		TE CIVIL	EE I		4*2	
		BE CIVIL	IWPC	4		
			PW		2	
7	Mr.Jayant Kale	TE CIVIL	SDD II	4	2*4	20
		BE CIVIL	CMII	4	2*2	
8	Mrs. Jyoti Mali	SE CIVIL	TOS I	1		16
		TE CIVIL	TOS II	1		
			TOM		4*2	
			EE I	4		
		BE CIVIL	PW		2	
9	Mr. B.V.Shinde	SE CIVIL	BDD		1*4	20
		TE CIVIL	GTE II	4	1*2	
		BE CIVIL	SDD III		1*4	
			PW		6	
10	Swami Suman	SE CIVIL	SUR II		4*2	20
			FM I	1		
			TOS I	1		
		TE CIVIL	TRE II	5		
			TOS II	1		
		BE CIVIL	SDD III		1*4	
11	Ms.Tejaswini Patil	SE CIVIL	TOS I	1		19
			FM I	1		
			BDD		1*4	
		TE CIVIL	TOS II	5		
		BE CIVIL	CMII		1*2	
			WRE II		3*2	

12	Mr.D.G.Pardeshi	SE CIVIL	BDD	4	2*4	19
			FM I		2*2	
		TE CIVIL	TRE II	1		
		BE CIVIL	WRE II	2		
13	Mr.J.G.Kachare	SE CIVIL	TOS I	1		19
		TE CIVIL	GTE II		2*3	
			TRE II	1		
			TOS II	1		
			SDD II		1*4	
		BE CIVIL	IWPC		3*2	
14	Mr.M.M.Sanklecha	SE CIVIL	TOS I	4		4

COLLEGE OF ENGINEERING AND TECHNOLOGY , BAMBHORI, JALGAON

CHEMICAL ENGINEERING DEPARTMENT

TEACHING LOAD - 2012 – 2013 (Term – II)

Sr. No	Name	Year and Branch	Subject	Theory (Hrs)	Practical (Batch × hrs)	Total
1	Dr. K.S.Wani	T.E.	CRE-I	4	0	04
2	Dr. V.R.Diware	B.E. T.E.	CPDPE PROJECT PEDD-II	4 - 4	1X4=4 4 --	16
3	Shri S.A.Thakur	B.E. T.E. S.E.	PROJECT MMC IEM UO II	- 4 4 --	4 -- -- 1X4=4	16
4	Shri V.P.Sangore	T.E. S.E.	IIA CHE-III CP I	4 4 -	2X2=4 1X2=2 1X2=2	16
5	Shri N.Y.Ghare	T.E. S.E.	MT-II PCAL	4 4	2X4=8 1X2=2	18
6	Shri A.R.Lokhande	B.E. S.E.	CAPEDMS PROJECT UO-II	4 -- 4	2X4=8 4 --	20
7	Ms. S.S.Madan	B.E. T.E. S.E.	IP&C CRE - I PEDD -II CP - I	4 - - 4	-- 2X2=4 1X4=4 --	16
8	Ms. S.V.Pande	B.E.. T.E.	PEEC CPDPE PEDD II	4 -- --	2X2=4 1X4=4 1X4=4	16
					TOTAL LOAD	122

COLLEGE OF ENGINEERING AND TECHNOLOGY , BAMBHORI, JALGAON

CHEMICAL ENGINEERING DEPARTMENT

TEACHING LOAD - 2012 – 2013 (Term – I)

Sr. No	Name	Year and Branch	Subject	Theory (Hrs)	Practical (Batch × hrs)	Total
1	Dr. K.S.Wani	B.E.	BCE	04	0	04
2	Dr. V.R.Diware	B.E. T.E.	CRE-II PROJECT SEMINAR PEDD-I	4 0 0 4	0 2 2 0	12
3	Shri S.A.Thakur	B.E. T.E.	PDC PROJECT SEMINAR MT-I	4 0 0 4	0 2 2 1X4=4	16
4	Shri V.P.Sangore	S.E.	CHE-I CHE-II	4 4	2X2=4 2X2=4	16
5	Shri N.Y.Ghare	B.E. T.E.	TP PDC CET PEDD-I	4 0 4 0	0 2X2=4 0 1X4=4	16
6	Shri A.R.Lokhande	B.E. T.E. S.E.	EE PROJECT SEMINAR PHT CA	4 0 0 4 0	0 2 2 0 2X2=4	16
7	Ms. S.S.Madan	B.E. T.E.	CRE-II CP II MT-I	0 4 0	2X4=8 2X2=4 1X4=4	20
8	Shri R.S.Zambare	B.E. T.E. S.E.	EE PHT PEDD-I UO I	0 0 0 4	2X2=4 2X2=4 1X4=4 2X2=4	20
					TOTAL LOAD	120

LOAD DISTRIBUTION
COMPUTER DEPARTMENT
SEM-I 2012-13

Sr No.	Name of Staff	Year & Branch	Subject	TH	PR	Total
1	K.P. Adhiya	BECOMP(A)	AUP	4	4*2	20
		BECOMP(B)	AUP	4	---	
		BECOMP(A+B)	PW	-	04	
2	M. E. Patil	TECOMP(A)	SP	4	1*2	14
		TECOMP(B)	SP	4	--	
		BECOMP(A+B)	PW	--	04	
3	Sandip S. Patil	BECOMP(A)	AI	4	2*2	16
		BECOMP(B)	AI	4	--	
		BECOMP(A+B)	PW	--	04	
4	Ashish Bhole	BECOMP(A)	ACN	4	--	16
		BECOMP(B)	ACN	4	----	
		TECOMP(B)	CN	--	1*2	
		TECOMP(B)	CN	--	1*2	
		BECOMP(A+B)	PW	--	04	
5	S.S. Gharde	BECOMP(A)	OOMD	4	---	16
		BECOMP(B)	OOMD	4	2*2	
		BECOMP(A+B)	PW	--	04	
6	Saroj Patil	SECOMP(A)	PL-I	3	1*4	7
7	Shital Patil	TECOMP(A)	ADTL	--	4*4	20
		BECOMP(A+B)	PW	--	04	
8	N.Y.Suryawanshi	TECOMP(A)	TCS	4	--	18
		TECOMP(B)	TCS	4	--	
		TECOMP(B)	SP	--	3*2	
		BECOMP(A+B)	PW		04	
9	Nilima Patil	TECOMP(A)	CG	4	--	18
		TECOMP(B)	CG	4	3*2	
		BECOMP(A+B)	PW	--	04	
10	Priti Sharma	SECOMP(A)	DSMP	4	3*2	18
		SECOMP(B)	DSMP	4	--	
		BECOMP(A+B)	PW	--	04	

11	Deepak Bage	BECOMP(A)	ES	4	3*2	18
		BECOMP(B)	ES	4	--	
		BECOMP(A+B)	PW	--	04	
12	Yogeshwari Borse	TECOMP(A)	CN	4	4*2	20
		TECOMP(B)	CN	4	--	
		BECOMP(A+B)	PW	--	04	
13	Satpal Rajput	SECOMP(A)	IME	4	-	18
		SECOMP(B)	IME	4	--	
		SECOMP(A)	PL-I	--	2*4	
		BECOMP(A+B)	PW	--	02	
14	Babulal Rathod	SECOMP(B)	PL-I	3	3*4	17
		BECOMP(A+B)	PW	--	2	
15	Vijay Ingle	TECOMP(B)	ADTL	--	4*4	18
		BECOMP	PW	--	2	
16	Vijay Kotkar	TECOMP(A)	MP-II	4	4*2	18
		TECOMP(B)	MP-II	4	---	
		BECOMP(A+B)	PW	--	02	
17	Chittaranjan Mangale	SECOMP(A)	DSGT	4	--	16
		SECOMP(B)	DSGT	4	--	
		SECOMP(B)	DSMP	--	3*2	
		BECOMP(A+B)	PW	--	02	
18	Avinash Patil	BECOMP(A)	ES	---	1*2	20
		BECOMP(B)	ES	---	4*2	
		TECOMP(A)	SP	---	3*2	
		TECOMP(B)	SP	---	1*2	
		BECOMP(A+B)	PW	--	02	
19	Manoj Mahajan	FE	CP	3	3*2	19
		BECOMP(B)	AI	--	4*2	
		BECOMP(A+B)	PW	--	02	

20	Poonam Bafana	TECOMP(B)	CN	--	2*2	16
		BECOMP(A)	OOMD	--	4*2	
		BECOMP(B)	OOMD	--	2*2	
21	Nutan Khadse	TECOMP(B)	MP-II	--	4*2	18
		BECOMP(B)	AUP	--	4*2	
		BECOMP(A+B)	PW	--	02	
22	Sushant Bahekar	FE( )	CP	3	3*2	18
		FE( )	CP	3	3*2	
23	Jitendra Patil	FE( )	CP	3	3*2	18
		FE( )	CP	3	3*2	
24	Kalyan Dani	FE( )	CP	3	3*2	18
		FE( )	CP	3	3*2	
25	Ravi Ahuja	FE( )	CP	3	3*2	18
		FE( )	CP	3	3*2	
26	Mayuri Patil	TECOMP(A)	CG	--	4*2	14
		TECOMP(B)	CG	--	1*2	
		BECOMP(A)	AI	--	2*2	

Total=447

Timetable Incharge
Shital A Patil
Priti Sharma

HOD
Comp Deptt.

LOAD DISTRIBUTION 25-12-12

COMPUTER DEPARTMENT

SEM-II 2012-13

Sr No.	Name of Staff	Year & Branch	Subject	TH	PR Batches * hours	Total
1	K.P. Adhiya	SECOMP(A)	CO	4	--	14
		SECOMP(B)	CO	4	--	
		BECOMP(A+B)	PW	-	06	
2	M. E. Patil	BECOMP(A)	SMQA	4	--	14
		BECOMP(B)	SMQA	4	--	
		BECOMP(A+B)	PW	--	06	
3	Sandip S. Patil	BECOMP(A)	DWM	4	--	14
		BECOMP(B)	DWM	4	--	
		BECOMP(A+B)	PW	--	06	
4	Ashish Bhole	TECOMP(A)	SE	4	--	12
		TECOMP(B)	SE	4	--	
		BECOMP(A+B)	PW	--	04	
5	S.S. Gharde	BECOMP(A+B)	$CC_{(elective)}$	4	1*2	12
		BECOMP(A+B)	PW	--	06	
6	Saroj Patil	SECOMP(A)	PL-II	2	2*4	10
7	Shital Patil	TECOMP(A)	ADA	--	4*2	13
		SECOMP(B)	PL-II	--	01	
		BECOMP(A+B)	PW	--	04	
8	N.Y.Suryawanshi	TECOMP(A)	ADA	4	--	14
		TECOMP(B)	ADA	4	--	
		BECOMP(A+B)	PW		06	
9	Nilima Patil	SECOMP(A)	MP-I	4	1*2	16
		SECOMP(B)	MP-I	4	--	
		BECOMP(A+B)	PW	--	06	
10	Dinesh Puri	BECOMP(A+B)	$MN_{(elective)}$	4	2*2	10
		BECOMP(A+B)	PW	--	02	

11	Atul Dusane	BECOMP(A)	ACA	4	--	16
		BECOMP(B)	ACA	4	--	
		SECOMP(B)	MP-I	-	4*2	
12	Priti Sharma	BECOMP(A)	DWM	-	4*2	14
		SECOMP(A)	DSD	1	-	
		SECOMP(B)	DSD	1	--	
		BECOMP(A+B)	PW	--	04	
13	Deepak Bage	TECOMP(A)	MP-III	4	--	14
		TECOMP(B)	MP-III	4	--	
		BECOMP(A+B)	PW	--	06	
14	Yogeshwari Borse	TECOMP(B)	DBMS	--	4*2	12
		BECOMP(A+B)	PW	--	04	
15	Satpal Rajput	SECOMP(A)	DSD	4	-	16
		SECOMP(B)	DSD	4	--	
		TECOMP(B)	SE	--	3*2	
		BECOMP(A+B)	PW	--	02	
16	Babulal Rathod	BECOMP(A)	ACA	--	4*2	12
		BECOMP(A+B)	PW	--	4	
17	Vijay Ingle	TECOMP(B)	MP-III	--	4*2	18
		BECOMP(B)	ACA	--	4*2	
		BECOMP(A+B)	PW	--	2	
18	Vijay Kotkar	TECOMP(A)	OS	4	2*2	14
		TECOMP(B)	OS	4	---	
		BECOMP(A+B)	PW	--	02	
19	Chittaranjan Mangale	TECOMP(A)	DBMS	4	1*2	14
		TECOMP(B)	DBMS	4	--	
		BECOMP(A+B)	PW	--	04	
20	Avinash Patil	SECOMP(A)	DC	4	--	14
		SECOMP(B)	DC	4	--	
		TECOMP(A)	OS	--	2*2	
		BECOMP(A+B)	PW	--	02	

21	Manoj Mahajan	SECOMP(B)	DSF	--	3*4	14
		BECOMP(A+B)	PW	--	02	
22	Nutan Khadse	TECOMP(A)	DBMS	--	3*2	12
		SECOMP(A)	MP-I	--	3*2	
23	Sushant Bahekar	BECOMP(B)	CC	--	3*2	14
		TECOMP(A)	SE	--	2*2	
		BECOMP(A)	ACA	1	--	
		BECOMP(B)	ACA	1	--	
		BECOMP(A+B)	PW	--	02	
24	Jitendra Patil	BECOMP(B)	SMQA	1	---	18
		BECOMP(B)	SMQA	1	4*2	
		SECOMP(A)	PL-II	--	2*4	
25	Kalyan Dani	TECOMP(B)	ADA	--	4*2	12
		BECOMP(A+B)	PW	--	04	
26	Ravi Ahuja	SECOMP(A)	DSF	4	2*4	16
		SECOMP(B)	DSF	4	--	
27	Mayuri Patil	BECOMP(B)	DWM	--	4*2	14
		TECOMP(A)	SE	--	2*2	
		TECOMP(A)	SE	--	1*2	
28	Ashish Patil	TECOMP(A)	MP-III	--	4*2	16
		BECOMP(A)	SMQA	--	4*2	
29	Ravi Mulchandani	SECOMP(B)	PL-II	2	4*4	18
30	Chitra Patil	BECOMP(A)	CC	--	1*2	12
		BECOMP(B)	CC	--	1*2	
		TECOMP(B)	OS	--	4*2	
31	Shruti Pardeshi	SECOMP(A)	DSF	--	2*4	12
		SECOMP(B)	DSF	--	1*4	

Timetable Incharge
Shital A Patil
Priti Sharma

HOD
Comp Deptt.

Electrical Engineering Department

Load Distribution 2012-2013 Semester-I

Sr. No.	Name of Staff member	Year & Branch	Subject	Theory (Hrs.)	Practical Batch X Hrs.	Total
01	D.U.Adokar	TE Electrical BE Electrical	MPMC Seminar Project	4 2	4X2=8 4	18
02	Dr. S. K. Mittal	TE Electrical BE Electrical BE Electrical BE Electrical	EME Elective-I Seminar Project	4 4*+1	 2 2	13
03	V.S.Pawar	SE Electrical BE Electrical	ACCT IEE Project	4 4	 4X2=8 2	18
04	M.M.Ansari	TE Electrical BE Electrical	EM/C-II EAC Project	4 4	4X2=8 2	18
05	S.M.Shembekar	TE Electrical BE Electrical BE Electrical	PS-II PSOC Project	4 4	4X2=8 2	18
06	D.S.Patil	SE Electrical BE Electrical BE Electrical	EEM HVE Seminar	4 4	2X3=6 2	16
07	Miss N. A. Pande	SE Electrical	EM-I	4	2X6=12	16
08	V. K. Patil	TE Electrical TE Electrical	EIED SA	4	4X2=8 2X2=4	16
09	Mr. S.S. Nagarnaik	SE Electrical TE Electrical BE Electrical	ACCT SA HV		2X3=6 2X2=4 4X2=8	18
	Total			52	98	151

*Tutorial

HOD

Electrical Engineering Department

Electrical Engineering Department
Load Distribution 2012-2013 Semester-II

Sr. No.	Name of Staff member	Year & Branch	Subject	Theory (Hrs.)	Practical Batch X Hrs.	Total
01	D.U.Adokar	SE Electrical BE Electrical	ADE Project	4	4X2=8 2	06
02	V.S.Pawar	TE Electrical BE Electrical	CS-I Ellective II Project II	4 4*+1	2X2=4 2	15
03	M.M.Ansari	SE Electrical BE Electrical	EM/C-I PSS Project II	4 4	 2	10
04	S.M.Shembekar	SE Electrical BE Electrical	PS-I SGP Project II	4 4	2X2=4 2	14
05	D.S.Patil	SE Electrical TE Electrical	DCTP EM II	4 4		08
06	N. S. Mahajan	TE Electrical	PE	4	4X2=8	12
07	Miss N. A. Pande	TE Electrical BE Electrical	IOM IDC	4*+1 4	 3X2=6	15
08	V. K. Patil	TE Electrical	EMD	4	6X2=12	16
09	Mr. S.S. Nagarnaik	SE Electrical	NA	4*+1	3X2=6	11
10	Miss. S Mahale	BE Electrical SE Electrical	PSS DCTP		4X2=8 1X2=2	10
11	Miss. Minal Rade	TE Electrical TE Electrical	CS-I P. Training		2X2=4 8	12
12	Miss. Lalita Patil	SE Electrical TE Electrical	EM II DCTP		4X2=8 2X2=4	12
13	Prem Shankar	SE Electrical BE Electrical	EW/S IDC		3X2=6 1X2=2	08
14	Samir Shaikh	SE Electrical BE Electrical	EM/C-I SGP		3X2=6 2X2=4	10
15	Jagdish Chitte	TE Electrical BE Electrical	EMD-I EDS		2X2=4 2X2=4	08
16	K. Deshmukh	SE Electrical	ADE		3X2=6	06
17	Siddharth Patil	SE Electrical	EMIE (Mech)	4	3X2=6	10
	Total			63	138	183

*Tutorial

HOD

Electrical Engineering Department

SSBT's COET, BAMBHORI.
E & TC ENGG. DEPT.
TEACHING LOAD SHEET
Term- I
2012-2013

Sr. No.	Name	Year and Branch	Subject	Theory (Hrs)	Practical (Batch*hrs)	Total
01	Prof. S.R.Suralkar	S.E E&TC BE E & TC BE ETC	DCLD (A) Project Seminar	04 --- ---	2 * 2 = 04 02 02	12
02	Prof.M.P.Deshmukh	S.E ETC SE ETC BE E & TC	SDC (A) ECM (B) Project Seminar	04 04 -- ---	1 * 4 = 04 --- 02 02	16
03	Prof. P.J.Shah	B.E E&TC BE E & TC	VLSI (A,B) Project Seminar	08 --- ---	2 * 2 = 04 02 02	16
04	Prof.V .M. Deshmukh	T.E E&TC TE E&TC BE ETC	EME (B) FCS (A) Project Seminar	4+1 (TUT) 04 --- ---	--- 2 * 2 = 04 02 02	17
05	Prof. P.V. Thakre	BE E & TC BE E & TC BE ETC	FOC (B) DSP (A) Project seminar	04 04 --- ---	1* 2 = 2 --- 02 02	14
06	Prof. S.U.Nyati	BE E & TC TE E&TC BE E & TC	DSP NAS (B) Project Seminar	04 04+1 (TUT) -- ---	2 * 2 = 04 --- 02 02	17
07	Prof. N.M.Kazi	BE E & TC TE ETC BE E & TC	CCN (A,B) NAS Project seminar	08 --- --- ---	---- 2 * 2 = 04 02 02	16
08	Prof. A.H.Karode	SE E&TC BE E&TC	EI (A,B) Project Seminar	08 --- ---	4 * 2 = 08 02 02	20
09	Prof. A.C.Wani	SE E&TC SE COMP BE E & TC	SDC (B) AE Project Seminar	04 04 --- ---	2 * 4 = 08 --- 02 02	20
10	Prof. P.H.Zope	T.E E&TC BE E & TC	MMS (A,B) Project Seminar	08 --- ---	4* 2 = 08 02 02	20

11	Prof. S.P.Ramteke	B.E E&TC BE E & TC	RMT (A,B) Project Seminar	08 --- 	4 * 2 = 08 02 02	20
12	Prof.S.K.Khode	TE E&TC BE E&TC	DC (B) Project Seminar	04 --- ---	6 * 2 = 12 02 02	20
13	Miss. K.S. Mantri	SE COMP BE ETC	AE (B) FOC	04 ---	6 * 2 = 12 1* 2 = 02	18
14	Prof. A. R. Bari	SE E&TC	ECM (A)	08	7 * 2 = 14	18
15	Mrs M. J. Patil	SE E&TC TE ETC SE E&TC	EMC (B) DC (A) EWS	04 04 	--- --- 5 * 2 = 10	18
16	Mrs. D. R. Patil	TE E&TC TE ETC TEETC	FCS (B) NAS (A) SA II	04 04+1 (TUT) ---	3 * 2 = 06 1 * 2 = 02	17
17	Miss P. Shanbhag	SE ETC TE E&TC SE ETC	EI NAS SDC	--- --- ---	3 * 2 = 06 5 * 2 = 10 1 * 4 = 04	20
18	Prof. S. A. Hingonekar	BE ETC SE ETC BE ETC BE ETC	FOC (A) EMC (A) RMT Project Seminar	04 04 --- --- ---	--- --- 4 * 2 = 08 02 02	20
19	Mrs. Bharti Khadse	TE ETC SE ETC BE ETC	EME (A) DCLD (B) PROJECT	04+1 (TUT) 04 ---	--- 3 * 2 = 06 02	17
20	Miss Akshata Sapkal	TE ETC BE ETC SE ETC	 DSP DCLD	--- --- 	 7 * 2 = 14 2 * 2 = 04	18
21	Mr. Ranjeetsingh Kalsi	TE ETC SE ETC SE ETC	SA II SDC EWS	--- --- ---	1 * 2 = 02 3 * 4 = 12 2 * 2 = 04	18
22	Mr. Yogesh Santwani	BE ETC TE ETC BE ETC	FOC MMS VLSI	--- --- --- --- ---	2 * 2 = 04 2 * 2 = 04 6 * 2 = 12	20
23	Mr. Manoj Sadanshiv	BE ETC TE ETC TE ETC	FOC SA II FCS	--- --- ---	4 * 2 = 08 4 * 2 = 08 1 * 2 = 02	18

Total Load = 406 Hrs

Time Table Incharge **HOD**

SSBT's COET, BAMBHORI.
ETC ENGG. DEPT.
TEACHING LOAD SHEET
Term- II
2012-2013

Sr. No.	Name	Year and Branch	Subject	Theory (Hrs)	Practical (Batch*hrs)	Total
01	Prof. S.R.Suralkar	TE ETC BE ETC	EM (A) PROJ	04 --	2 * 2 = 04 04	12
02	Prof.M.P.Deshmukh	FE (H,I,J) BE ETC	EEEE PROJ	09 ---	---- 04	13
03	Prof. P.J.Shah	TE ETC BE ETC	PE (A,B) PROJ	08 --	1 * 2 = 02 04	14
04	Prof.V.M.Deshmukh	SE ETC BE ETC	NL (A,B) PROJ	08+2(TUT) ---	---- 04	14
05	Prof. P.V. Thakre	BE ETC FE (C) BE ETC	SAT (A) EEEE PROJ	04 03 ---	2 * 2 = 04 --- 04	15
06	Prof. S.U.Nyati	BE ETC TE ETC BE ETC	TM (B) ITCT (B) PROJ	04 04+1(TUT) --	1 * 2 = 02 -- 04	15
07	Prof. N.M.Kazi	BE ETC BE ETC FE (A)	TV (B) PROJ EEEE	04 -- 03	1 * 4 = 04 04	15
08	Prof. A.H.Karode	TE ETC BE ETC	EM (B) PROJ	04 ----	4 * 2 = 08 04	16
09	Prof. A.C.Wani	TE ETC BE ETC FE (G)	ECD (B) PROJ EEEE	04+1(TUT) -- 03	2 * 2 = 04 04 ---	16
10	Prof. P.H.Zope	BE ETC BE ETC	ESD (A,B) PROJ	08 --	2* 2 = 04 04	16
11	Prof. S.P.Ramteke	SE ETC BE ETC	AC (A,B) PROJ	08 ---	2 * 2 = 04 04	16
12	Prof.S.K.Khode	TE ETC TE ETC BE ETC	PE ITCT PROJ	-- 4+1(TUT) --	3 * 2 = 06 -- 04	15
13	Miss. K.S. Mantri	SE ETC	ECA (A,B)	08	2 * 4 = 08	16
14	Prof. A. R. Bari	TE ETC BE ETC	AICA (A,B) PROJ	08 ---	2* 2 = 04 04	16

15	Mrs M. J. Patil	SE ETC TE ETC	MS (B) PT/MP	04 ---	--- 6 * 2 = 12	16
16	Mrs. D. R. Patil	FE (D,F)	EEEE	06	4 * 2 = 08	14
17	Miss P. Shanbhag	FE (E) SE ETC	EEEE NL	03 ---	-- 6*2= 12	15
18	Miss Akshada Sapkal	FE (B) SE ETC	EEEE ECA	03 ---	-- 3 * 4 = 12	15
19	Prof. S. A. Hingonekar	BE ETC BE ETC	TV PROJ	04 --	2 * 4 = 08 04	16
20	Mr. Ranjeetsingh	BE ETC SE ETC BE ETC	SAT (B) ECA TV	04 --- ---	--- 2 * 4 = 08 1 * 4 = 04	16
21	Mrs. Bharti Khadse	BE ETC BE ETC BE ETC	TM (A) TV PROJ	04 --- ---	2 * 2 = 04 1 * 4 = 04 04	16
22	Mr. Y. S. Santwani	SE MECH BE ETC	EMID (B) ESD	04 ---	3 * 2 = 06 3 * 2 = 06	16
23	Mr. Manoj Sadanshiv	TE ETC SE ETC	AICA SA I	--- ---	1 * 2 = 02 7 * 2 = 14	16
24	Mr K Pandey	TE ETC BE ETC	ECD(A) SAT COM	4+1 ---	4 * 2 = 08 2 * 2 = 04	17
25	Mr Imran Khan	SE ETC	MS (A) TV & CE	04	--- 03 * 4 = 12	16
26	Mr Shantanu Nanderkar	BE ETC TE ETC	TM AICA	----	5 * 2 = 10 3 * 2 = 6	16
27	Mr Harshal Kamlaskar	TE ETC BE ETC SE ETC	PE SAT COM AC	-----	02 * 2 = 04 01 * 02 =02 5 * 2 = 10	16
28	Mr Pravin Pathade	BE ETC FE	SAT COM EEEE	-----	03 * 02 =06 06 * 02=12	18
29	Miss Rachana Patil	FE SE ETC	EEEE NL	----	07 * 02=14 01 * 02 = 2	16
30	Mr Rahul Deshmukh	FE	EEEE	----	08 * 02=16	16
31	Miss Priyank koshti	BE ETC FE	ESD EEEE	--- ---	03 * 02 = 06 05 * 02 =10	16

Total Load = 480 Hrs

Time Table Incharge **HOD**

SSBT's COET, BAMBHORI.
ETC ENGG. DEPT.
TEACHING LOAD SHEET FIRST YEAR
Term- II
2012-2013

Sr. No.	Name	Year and Branch	Subject	Theory (Hrs)	Practical (Batch*hrs)	Total
01	Prof.M.P.Deshmukh	FE	EEEE	09	---	09
02	Prof. P.V. Thakre	FE	EEEE	03	---	03
03	Prof. N.M.Kazi	FE	EEEE	03	_____	03
04	Prof. A.C.Wani	FE	EEEE	03	---	03
05	Mrs. D. R. Patil	FE	EEEE	06	04*02=08	14
06	Miss P. Shanbhag	FE	EEEE	03	--	03
07	Miss Akshada Sapkal	FE	EEEE	03	--	03
08	Mr Harshal Kamlaskar	FE	EEEE	-----	03*02 =06	06
09	Mr Pravin Pathade	FE	EEEE	-----	06 * 02=12	12
10	Miss Rachana Patil	FE	EEEE	----	07 * 02=14	14
11	Mr Rahul Deshmukh	FE	EEEE	----	08 * 02=16	16
12	Miss Priyanka Koshti	FE	EEEE	---	05 * 02 = 10	10

Total Load = 90 Hrs

Time Table Incharge **HOD**

S.S.B.T'S College of Engineering & Technology, Bambhori, Jalgaon
Department of Information Technology
Load Distribution (SEM-I) 2012-13

Sr. No.	Staff Name	Designation	Class	Subject	Theory	Practical	Total Load
1	Mrs. A. K. Bhavsar	Asso. Prof	BE IT	OOMD	04	03*02=06	14
			BE IT	PW		02	
			BE IT	SM		02	
2	Mr. S. J. Patil	A.P	TE IT	CN	04	03*02=06	18
			BE IT	E-COM	04	--	
			BE IT	PW		02	
			BE IT	SM		02	
3	Mr. N. P. Jagtap	A.P	BE IT	ES	04	03*02=06	18
			SE IT	PPM	04	--	
			BE IT	PW		02	
			BE IT	SM		02	
4	Mr. S. H. Rajput	A.P	TE IT	TCS	04	--	20
			SE IT	DSMP	04	04*02=08	
			BE IT	PW		02	
			BE IT	SM		02	
5	Mr. R. B. Sangore	Lecturer	TE IT	MT	04	05*02=10	22
			SE IT	IME	04	--	
			BE IT	PW		02	
			BE IT	SM		02	
6	Mr. P. C. Harne	Lecturer	TE IT	SP	04	05*02=10	22
			BE IT	ERP	04	--	
			BE IT	PW		02	
			BE IT	SM		02	
7	Mr. B. S. Kalsi	Lecturer	BE IT	AUP	04	03*02=06	20
			TE IT	ADTL	--	02*04=08	
			BE IT	PW		02	
8	Ms. A. D. Punjabi	Lecturer	SE IT	PL-I	03	01*04=04	21
			TE IT	ADTL	--	03*04=12	
			BE IT	PW		02	
9	Ms. Pinjari	Lecturer	TE IT	CG	04	05*02=10	20
			BE IT	ERP	--	03*02=06	
10	Ms. T. S. Joshi	Lecturer	SE IT	DSGT	04	--	20
			TE IT	CN	--	02*02=04	
			SE IT	PL-I	--	03*04=12	
Total							**195**

TIME TABLE I/C **HOD** **PRINCIPAL**

S.S.B.T'S College of Engineering & Technology, Bambhori, Jalgaon
Department of Information Technology
Load Distribution (SEM-II) 2012-13

Sr. No.	Staff Name	Designation	Class	Subject	Theory	Practical (Batch *Hrs)	Total Load
1	Mrs. A. K. Bhavsar	Asso. Prof	TE IT	SE	04	3*2=6	14
			BE IT	PROJECT	--	04	
2	Mr. S. J. Patil	A.P	TE IT	WD	04	--	16
			BE IT	IS	04	2*2=4	
			BE IT	PROJECT	--	04	
3	Mr. N. P. Jagtap	A.P	BE IT	DWM	04	2*2=04	16
			TE IT	DBMS	04	--	
			BE IT	PROJECT	--	04	
4	Mr. S. H. Rajput	A.P	BE IT	SMQA	04	--	16
			SE IT	MP-I	04	2*2=04	
			BE IT	PROJECT	--	04	
5	Mr. R. B. Sangore	Lecturer	TE IT	OS	04	3*2=06	18
			SE IT	DC	04	--	
			BE IT	PROJECT	--	04	
6	Mr. P. C. Harne	Lecturer	BE IT	AINN	04	3*2=06	18
			TE IT	MIS	04	--	
			BE IT	PROJECT	--	04	
7	Mr. B. S. Kalsi	Lecturer	SE IT	IT	04	--	16
			BE IT	DWM	--	1*2=02	
			BE IT	SMQA	--	3*2=06	
			BE IT	PROJECT	--	04	
8	Ms. A. D. Punjabi	Lecturer	SE IT	DSF	04	01*04=04	14
			TE IT	OS	--	02*02=4	
			BE IT	PROJECT	--	02	
9	Ms. S.S. Pinjari	Lecturer	SE IT	CO	04	--	14
			TE IT	DBMS	--	2*5=10	
10	Ms. T. S. Joshi	Lecturer	SE IT	PL-II	02	3*4=12	16
			BE IT	IS	--	1*2=2	
11	Mr. S. B. Patil	Lecturer	TE IT	WD	---	3*4=12	16
			SE IT	PL-II	--	1*4=04	
12	Ms. S. A. Dhumale	Lecturer	SE IT	DSF	--	3*4=12	16
			TE IT	SE	--	2*2=4	
13	Mr. S. K. Singh	Lecturer	SE IT	MP-I	--	2*2=4	12
			TE IT	WD	--	2*4=8	

TOTAL:-202

TIME TABLE I/C **HOD** **PRINCIPAL**

DEPARTMENT OF MEANICAL ENGG. (UNDERGRADUATE)

Load distribution

SEM – I (2012 – 13)

Sr. No.	Name	Class	Subject	Theory (Hr)	Practical (Batch X Hr)	Total
1.	J. R. Chaudhari	FE(A)	EM	03	---	11
		SE(A)	MS	04	---	
		BE	Project/seminar	---	04	
2.	N. K. Patil	FE(B)	EM	03	---	15
		SE	CG	---	02 x02	
		BE(A)	OR	04	---	
		BE	Project/seminar	---	04	
3.	M. S. Murthy	TE(A)	HTMT	04	---	14
		BE(B)	RAC	04	01 x02	
		BE	Project/seminar	---	04	
4.	K.Shrivastava	TE(B)	HTMT	04	01 x02	14
		BE(A)	RAC	04	---	
		BE	Project/seminar	---	04	
5.	S.P. Shekhawat	TE(A)	TOM-II	04	---	08
		BE	Project/seminar	---	04	
6.	M.V. Rawlani	TE(A)	NACM	02	---	14
		BE(B)	OR	04	---	
		SE	MS	---	02 x02	
		BE	Project/seminar	---	04	
7.	P.G. Damle	TE(A&B)	MD-I	08	02 x02	16
		BE	Project/seminar	---	04	
8.	D.B. Sadaphale	SE(B)	MS	04	02 x02	18
		SE(A)	AT	04	01 x02	
		BE	Project/seminar	---	04	
9.	P.N. Ulhe	SE(A&B)	SOM	08	--	18
		SE	CG	---	03 x02	
		BE	Project/seminar	---	04	
10.	P. M. Solanki	TE(A)	NACM	02	---	18
		BE(A)	CAD/CAM	04	02 x02	
		SE	CG	---	02 x02	
		BE	Project/seminar	---	04	
11.	P. D. Patil	BE(B)	CAD	04	04 x02	18
		BE(A)	AUTOBOMILE	02	---	
		BE	Project/seminar	---	04	
12.	A. R. Bhardwaj	SE(A)	ME-I	04	---	18
		SE	MD	---	04 x02	
		TE	MD-I	---	03 x02	
13.	C. K. Mukherjee	TE(B)	NACM	04	06 x02	18
		BE(A)	AUTOMOBILE	02	---	
14.	P. P. Bornare	TE (A)	ICE	04	04 x02	18
		BE(B)	AUTO	04	---	
		TE	NACM	---	01 x02	
15.	D. R. Patil	TE(B)	ICE	04	04 x02	18

		TE	MD-I	---	03 x02	
16.	V. K. Saindane	SE(B)	AT	04	03 x02	18
		BE	MTX	---	03 x02	
		TE	TOM-II	---	01 x02	
17.	D. S. Shinde	TE(B)	TOM-II	04	07 x02	18
18.	D. D. Patil	BE(A)	MTX	04	03 x02	18
		TE	CPP	---	03 x02	
		TE	NACM	---	01 x02	
19.	M. D. Dhanke	BE(A)	MTX	04	02 x02	20
		BE	RAC	---	06 x02	
20.	P. S. Jadhav	SE(Elect.)	AT	04	03 x02	18
		SE	AT	---	02 x02	
		BE	RAC	---	01 x02	
		TE	HTMT	---	01 x02	
21.	J. R. surange	SE(B)	ME-I	04	---	18
		BE	CAD	---	02 x02	
		TE	CPP	---	05 x02	
22.	M. D. Hadpe	SE	MS	---	02 x02	20
		SE	MD	---	02 x02	
		TE	HTMT	---	06 x02	

H.O.D
Dept. Mechanical Engg.

DEPARTMENT OF MEANICAL ENGG. (UNDERGRADUATE)

Load distribution

SEM – II (2012 – 13)

Sr. No.	Name	Class	Subject	Theory (Hr)	Practical (Batch X Hr)	Total
1.	J. R. Chaudhari	FE	EDEME	06	01 x 04	14
		BE	PROJECT	--	04	
2.	N. K. Patil	FE	EDEME	03	01 x 04	15
		TE	MMM	04	--	
		BE	PROJECT	--	04	
3.	D.S. Deshmukh	FE	EDEME(EME)	06	01 x 04	18
		TE	TURBO	--	02 x 02	
		BE	PROJECT	--	04	
4.	K. Shrivastava	FE	EDEME	03	01 x 04	15
		TE	TURBO	04	--	
		BE	PROJECT	--	04	
5.	S.P.Shekhawat	SE	TOM-I	05	--	09
		BE	PROJECT	--	04	
6.	M.V. Rawlani	FE	EDEME	03	01 x 04	15
		TE	PBM	04	--	
		BE	PROJECT	--	04	
7.	P. G. Damle	FE	EDEME	03	01 x 04	18
		TE	MD-II	05	01 x 02	
		BE	PROJECT	--	04	
8.	D.B. Sadaphale	SE	FM	05	03 x 02	15
		BE	PROJECT	--	04	
9.	P. N. Ulhe	BE(A & B)	MV	08	01 x 02	14
		BE	PROJECT	--	04	
10.	P.M.Solanki	FE	EDEME	03	01 x 04	20
		BE	FEA	05	01 x 04	
		BE	PROJECT	--	04	
11.	P.D. Patil	FE	EDEME	03	01 x 04	17
		SE	ME-II	02	--	
		BE	FEA	--	01 x 04	
		BE	PROJECT	--	04	
12.	A.R. Bhardwaj	SE	ME-II	02	--	14
		FE	EDEME	--	01 x 04	
		TE	PBM	--	04 x 02	
13.	C.K. Mukherjee	SE	IE	04	--	19
		FE	EDEME	03	03 x04	
14.	P.P. Bornare	TE	PBM	04	02 x 02	16
		FE	EDEME	--	02 x 04	
15.	D. R. Patil	TE	MD-II	05	02 x 02	17
		BE	FEA	--	01 x 04	
		FE	EDEME	--	01 x 04	
16.	V. K.Saindane	BE	TRIBO.	04	05 x 02	18
		FE	EDEME	--	01 x 04	
17.	D. S. Shinde	SE	FM	05	01 x 02	17
		SE	TOM-I	02	02 x 02	

		FE	EDEME	--	01 x 04	
18.	D. D. Patil	BE	ROBOTICS	04	--	18
		FE	EDEME	--	03 x 04	
		TE	EM	--	01 x 02	
19.	M. D. Dhanke	BE	ROBOTICS	04	--	14
		TE	PBM	--	01 x 02	
		TE	MMM	--	02 x 02	
		TE	MD-II	--	02 x 02	
20.	P. S. Jadhav	TE	EM	04	04 x 02	16
		FE	EDEME	--	01 x 04	
21.	J. R. Surange	SE	ME-II	04	--	16
		BE	FEA	--	02 x 04	
		FE	EDEME	--	01 x 04	
22.	M. D. Hadpe	FE	EDEME	03	04 x 04	19
23.	M. V. Kulkarni	TE	TURBO	04	05 x 02	18
		FE	EDEME(EME)	04	--	
24.	D. C. Talele	BE	FEA	05	03 x 04	17
25.	S. B. Chaudhari	BE	TRIBO	04	03 x 02	18
		FE	EDEME	--	02 x 04	
26.	N. B. Bauskar	SE	IE	04	--	14
		BE	MV	--	05 x 02	
27.	V. A. Revskar	TE	MMM	04	06 x 02	16
28.	M. I. Shaikh	SE	TOM-I	03	04 x 02	15
		TE	PBM	--	01 x 02	
		TE	TURBO	--	01 x 02	
29.	Jagruti Rane	TE	EM	04	03 x 02	16
		TE	MD-II	--	03 x 02	
30.	J. L. chaudhari	FE	EDEME	--	02 x 04	16
		SE	FM	--	02 x 02	
		BE	MV	--	02 x 02	

H.O.D
Dept. Mechanical Engg

DEPARTMENT OF MEANICAL ENGG. (POSTGRADUATE)
Load distribution
SEM – I (2012 – 13)

Sr. No.	Name	Class	Subject	Theory (Hr)	Practical (Batch X Hr)	Total
1.	J. R. Chaudhari	FE	Seminar- I	--	04	04
2.	N. K. Patil	FE	CMMD	01	03 x 02	
		FE	Seminar- I	--	04	11
3	S. P. Shekhawat	FE	IACS	03	--	
		FE	Seminar -I	--	04	07
4	P. G. Damle	FE	VE	03	03 x 02	
		FE	Seminar -I	--	04	13
5	D. B. Sadaphale	FE	AMED	03	--	
		FE	Seminar -I	--	04	07
6	P. N. Ulhe	FE	TRIBO	03	03 x 02	
		FE	Seminar-I	--	04	13
7	P. M. Solanki	FE	CMMD	02	--	
		FE	Seminar -I	--	04	06

DEPARTMENT OF MEANICAL ENGG. (POSTGRADUATE)
Load distribution
SEM – II (2012 – 13)

Sr. No.	Name	Class	Subject	Theory (Hr)	Practical (Batch X Hr)	Total
1.	J. R. Chaudhari	FE	Seminar- II	--	04	04
2.	N. K. Patil	FE	MTD	01	--	05
		FE	Seminar- II	--	04	
3	S. P. Shekhawat	FE	MPD	03	--	07
		FE	Seminar -II	--	04	
4	P. G. Damle	FE	DSM	03	03 x 02	13
		FE	Seminar -II	--	04	
5	D. B. Sadaphale	FE	MTD	02	--	
		FE	Seminar -II	--	04	12
		FE	MPD	--	03 x 02	
6	P. N. Ulhe	FE	OTD	03	03 x 02	13
		FE	Seminar-II	--	04	
7	P. M. Solanki	FE	PBT	03	--	07
		FE	Seminar -II	--	04	

H.O.D
Dept. Mechanical Engg

SSBT'S COLLEGE OF ENGG. AND TECH.BAMBHORI,JALGAON

DEPARTMENT OF BUSINESS ADMINISTRATION

Teaching Load Distribution for M.B.A. (2012-13) : (SEM-I & III)

SR.NO	Name of Staff	SUBJECT	TH	PR (Batches*Hrs)	TOTAL
1	Mr.V.S.Rana	Information Technology	4		13
		Industrial Relations & Trade Union	4		
		Industrial Relations & Trade Union	4		
		Information Technology		1	
2	Mr.S.R.Vasishtha	Promotion Management	4		8
		Corporate Communication	4		
3	Er.P.A.Anawade	Global Marketing Management	4		17
		Introduction to Operations Management	4		
		Legal Aspects of Business	4		
		Services Marketing	4		
		Information Technology		1	
4	Mr.H.A.Salunkhe	Corporate Social Responsibility	4		16
		Management of Banks & Financial Services	4		
		Tax Management	4		
		Financial Derivatives	4		
5	Ms.R.A.Modiyani	Accounting For Managers	4		17
		Strategic Management	4		
		Strategic Financial Management	4		
		Management of Banks & Financial Services	4		
		Information Technology		1	
6	Ms. Faroza Kazi	Labour Welfare and Administration	4		9
		Strategic and e-Human Resource Management	4		
		Information Technology		1	
7	Ms. Deepa Matani	Management Science	4		12
		Organizational Behaviour	4		
		HR Legislations	4		
8	Mr. Mukesh Ahirrao	Marketing Research	4		16
		Marketing Research	4		
		Entrepreneurship & PM	4		
		Managerial Economics	4		
			104	**4**	**108**

TIME TABLE I/C **HOD (MBA)** **PRINCIPAL**

SSBT'S COLLEGE OF ENGG. AND TECH.BAMBHORI,JALGAON

DEPARTMENT OF BUSINESS ADMINISTRATION

Teaching Load Distribution for M.B.A.(2012-13): (SEM-II & IV)

SR.	Name of Staff	Class	SUBJECT	TH	PR (Batches*Hrs)	TOTAL
1	Mr.V.S.Rana	MBA - II	Retail Mgmt & Consu Behavior	4		**8**
		MBA - I	Business Research Methods	4	-	
2	Mr.S.R.Vasishtha	MBA - II	Cases in Marketing Mgmt	4	-	**4**
3	Er.P.A.Anawade	MBA - I	Quantitative Techniques	4		**18**
		MBA - II	Supply Chain Management	4		
		MBA - II	Supply Chain Management	4		
		MBA - II	Indian Commercial Laws	4		
		F.E. Engg	Softskill Training	2	-	
4	Mr.H.A.Salunkhe	MBA - II	International financial mgmt	4		**12**
		MBA - II	Family Business Mgmt	4		
		MBA - I	Financial Mgmt	4	-	
5	Ms.R.A.Modiyani	MBA - I	Marketing Management	4		**14**
		MBA - I	Management Practices	4		
		MBA - I	Human Resource Mgmt	4		
		F.E. Engg	Softskill Training	2	-	
6	Ms. Faroza Kazi	MBA - II	Cases in HRM	4		**14**
		MBA - II	E-Commer & Excell mgmt	4		
		MBA - I	Mgmt Info system & ERP	4		
		F.E. Engg	Softskill Training	2	-	
7	Ms. Deepa Matani	MBA - II	Performance & Compe mgmt	4		**12**
		MBA - II	Performance & Compe mgmt	4		
		MBA - II	International HRM	4	-	
8	Mr. Mukesh Ahirrao	MBA - I	Glabal Economic Scenario	4		**16**
		MBA - II	Investment & Portfolio Mgt	4		
		MBA - II	Investment & Portfolio Mgt	**4**		
		MBA - II	Cases in Financial Mgt	**4**	-	
				98		**98**

TIME TABLE I/C **HOD (MBA)** **PRINCIPAL**

LOAD DISTRIBUTION
CIVIL ENGINEERING DEPARTMENT
SEM-II 2012-2013

Sr No.	Name Of Staff	Year & Branch	Subject	TH	PR Batches *hours	Total
1	Dr.M.Husain	M.E.CIVIL(F.E)	SWM	3		3
2	Dr.S.L.Patil	M.E.CIVIL(F.E)	WSM	3		3
3	Mr.P.A.Shirule	M.E.CIVIL(F.E)	AWTT	3		15
		M.E.CIVIL(S.E)	PW	12		
4	Mr.F.I.Chavan	M.E.CIVIL(F.E)	IWWWM	3		14
		M.E.CIVIL(S.E)	PW	11		
5	Mrs.Sonali Patil	M.E.CIVIL(F.E)	LP II		1*6	10
		M.E.CIVIL(S.E)	PW	4		
6	Mrs.Jyoti Mali	M.E.CIVIL(F.E)	AWWTT	3		10
		M.E.CIVIL(S.E)	PW	7		
7	Mr.B.V.Shinde	M.E.CIVIL(S.E)	PW	2		2

PG LOAD DISTRIBUTION
COMPUTER DEPARTMENT
SEM-I 2012-13

Sr No.	Name of Staff	Class	Subject	TH	PR Batches * hours	Total
1	K.P. Adhiya	ME I CSE	DS	3	--	7
		ME I CSE	Seminar	--	4	
2	M. E. Patil	ME I CSE	SPM	3	2*2	11
		ME I CSE	Seminar	--	4	
3	Sandip S. Patil	ME I CSE	ASE	3	2*2	11
		ME I CSE	Seminar	--	4	
4	Ashish Bhole	ME I CSE	NCC	3	2*2	11
		ME I CSE	Seminar	--	4	
5	S.S. Gharde	ME I CSE	AA	3	--	07
		ME I CSE	Seminar	--	4	

Total Load = 47

Timetable Incharge

HOD
Comp Deptt.

PG LOAD DISTRIBUTION
COMPUTER DEPARTMENT
SEM-II 2012-13

Sr No.	Name of Staff	Class	Subject	TH	PR Batches * hours	Total
1	M. E. Patil	ME I CSE	STQA	3	2*2	11
		ME I CSE	Seminar	--	4	
2	Sandip S. Patil	ME I CSE	SC	3	2*2	11
		ME I CSE	Seminar	--	4	
3	Ashish T.Bhole	ME I CSE	WE	3	--	07
		ME I CSE	Seminar	--	4	
4	S.S. Gharde	ME I CSE	ADBMS	3	2*2	11
		ME I CSE	Seminar	--	4	
5	Dinesh Puri	ME I CSE	PC	3	--	07
		ME I CSE	Seminar	--	4	

Total Load = 47

Timetable Incharge

HOD
Comp Deptt.

COLLEGE OF ENGINEERING & TECHNOLOGY, BAMBHORI.
ELECTRONICS & TELECOMMUNICATION DEPARTMENT
TEACHING LOAD SHEET
M.E. (DIGITAL ELECTRONICS) for Term- I
Year 2012-2013

Sr. No.	Name	Year and Term	Subject	Theory	Practical	Total
01	Prof. S.R.Suralkar	ME FY Term I	AIS DSD Seminar-I	01 -- --	02*01=02 02*01=02 04*01=04	09
02	Prof.P.H.Zope	ME FY Term I	P.C. Seminar-I	03	-- 04*01=04	07
03	Prof.A.H.Karode	ME FY Term I	AIS	02	02*01= 02	04
05	Prof.P.J.Shah	ME FY Term I	VLSI	03	----------	03
06	Prof.P.V.Thakare	ME FY Term I	ADSP	03	02*01= 02	05
07	Prof. D.U.Adokar	ME FY Term I	DSD	02	02*01= 02	04
08	Prof. S. P. Ramteke	ME FY Term I	ADSP		02*01= 02	02
09	Prof. B. K. Khadse	ME FY Term I	DSD	01		01
			Subtotal	15	20	
					Total	**35**

Total Teaching Load =35 Hrs.

Shram Sadhana Bombay, Trust's.
College of Engineering and Technology, Bambhori.
Department of Electronics and Telecommunication Engineering

TEACHING LOAD SHEET
M.E. (DIGITAL ELECTRONICS)
First Year Term- II
Year 2012-2013

Sr. No.	Name	Year and Term	Subject	Theory	Practical	Total
01	Prof. S. R. Suralkar	ME FY Term II	IP&PR(Th+LP-2) Seminar-II ADC(LP-2)	01 -- --	02*01=02 *04*01=04* 02*01=02	09
02	Prof. P. H. Zope	ME FY Term II	E.S.D (Th+LP-2) Seminar-II	03	02*02=04 *04*01=04*	11
03	Prof. A. H. Karode	ME FY Term II	IP&PR(Th+LP-2)	02	02*1 = 02	4
04	Prof. M. P. Deshmukh	ME FY Term II	MCD (Th)	01	----------	01
05	Prof. N. M. Kazi	ME FY Term II	ACN(Th)	03	--	03

06	Prof. A. C. Wani	ME FY Term II	MCD(Th)	02	--	02
07	Prof. S. U. NYATI	ME FY Term II	ADC(Th)	03	---	03
08	Prof S. P Ramteke	ME FY Term II	ADC(PR)	--	02*01 = 02	02
					TOTAL	35

Total Teaching Load = 35 Hrs.

H. O. D

(E & TC)

DEPARTMENT OF MEANICAL ENGG. (POSTGRADUATE)
Load distribution
SEM – I (2012 – 13)

Sr. No.	Name	Class	Subject	Theory (Hr)	Practical (Batch X Hr)	Total
1.	J. R. Chaudhari	FE	Seminar- I	--	04	04
2.	N. K. Patil	FE	CMMD	01	03 x 02	11
		FE	Seminar- I	--	04	
3	S. P. Shekhawat	FE	IACS	03	--	07
		FE	Seminar -I	--	04	
4	P. G. Damle	FE	VE	03	03 x 02	13
		FE	Seminar -I	--	04	
5	D. B. Sadaphale	FE	AMED	03	--	07
		FE	Seminar -I	--	04	
6	P. N. Ulhe	FE	TRIBO	03	03 x 02	13
		FE	Seminar-I	--	04	
7	P. M. Solanki	FE	CMMD	02	--	06
		FE	Seminar -I	--	04	

DEPARTMENT OF MEANICAL ENGG. (POSTGRADUATE)
Load distribution
SEM – II (2012 – 13)

Sr. No.	Name	Class	Subject	Theory (Hr)	Practical (Batch X Hr)	Total
1.	J. R. Chaudhari	FE	Seminar- II	--	04	04
2.	N. K. Patil	FE	MTD	01	--	05
		FE	Seminar- II	--	04	
3	S. P. Shekhawat	FE	MPD	03	--	07
		FE	Seminar -II	--	04	
4	P. G. Damle	FE	DSM	03	03 x 02	13
		FE	Seminar -II	--	04	
5	D. B. Sadaphale	FE	MTD	02	--	12
		FE	Seminar -II	--	04	
		FE	MPD	--	03 x 02	
6	P. N. Ulhe	FE	OTD	03	03 x 02	13
		FE	Seminar-II	--	04	
7	P. M. Solanki	FE	PBT	03	--	07
		FE	Seminar -II	--	04	

H.O.D
Dept. Mechanical Engg

Internal Continuous Evaluation System in place

The internal continuous evaluation system in place at this college level is done as per University guidelines currently enforce/ received before the start of term. The schedule for performance of practicals is notified on the departmental lab notice board. This schedule is batchwise and it also indicates the completion/ submission date of practical, drawing and assignment sheets. It is meant for those subjects for which term work marks are to be sent to the University.

The weekly record of the attendance of the students is maintained in the register meant for this purpose. This register also evaluates the performance of the students under the following headings :

a) Attendance in class/practical
b) Performance in class/practical
c) Class tests/ viva voce
d) Assignment/ Journal

The above are quantified and marks are awarded in the next week, displayed and consolidated at the end of term. At term end the term work assessment programme is displayed and the work is evaluated by two faculty members who are appointed by the Principal and the term work marks are forwarded to the University under the signature of both the examiners.

Students' assessment of Faculty, System in place.

During the 5th week of the term the feedback by the students is taken subject wise for the staff who teach them. A set of questionnaire is circulated them and feedback is obtained. This feedback is taken by academic monitoring committee comprising of three HOD's and Coordinator of Academic and Research and Development. The feedback is submitted to the Principal and he apprises the faculty member about their weak points and they are given the opportunity to improve upon their deficiencies and their weak points during the term itself.

Also during the term, students are free to pass on the difficulties through suggestion boxes kept at various location and if they are related to their academic difficulties, their difficulties are solved and the concerned faculty is advised by the Principal with sole aim of improvement in academics. Personal hearing are given by Coordinator of Academics and Research and Development and the Principal.