Report on
Capacity Building Program

SSBT's COLLEGE OF ENGINEERING & TECHNOLOGY
BAMBHORI, JALGAON - 425001, MS, INDIA
Included under Section 2(f) & 12(B) of the UGC Act 1956

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About the Program

Realizing the importance of preparing professionals in cutting - edge areas, the SSBT's College of Engineering & Technology, Bambhori, Jalgaon has initiated steps for continuous professional development of faculty members to meet the need of hour. As part of initiation, the institute organized capacity building program for faculty members from 17 January to 4 February 2023. In the program, the senior faculty members were the resource persons and all faculty members attended the program with full enthusiasm thereby creating the environment of peer - learning.

Objectives

The objectives of the program are as follows:

1. Empowering faculty members with cutting - edge technologies
2. Developing a culture of shared learning among faculty members
3. Inculcating creativity, critical thinking, communication, and cooperation among faculty members

Outcomes

The outcomes of the program are as follows:

1. Enriching curriculum with cutting - edge technologies
2. Motivating students for creativity, critical thinking, communication, and cooperation
3. Engaging students to apply engineering knowledge in societal, environmental & sustainable issues
4. Engaging in independednt and life-long learning

Artificial Consciousness

Date: 17 January 2023

Prof. (Dr.) Girish Kumar Patnaik
PRINCIPAL
Professor in Computer Engineering

In recent times, Artificial Intelligence (AI) has been in its peak in terms applications like self-driving cars, virtual assistants, decision support systems, health care robots, social robots, military robots, drone etc. These applications are built through various technologies like machine learning, deep learning, neural network etc. However, in real sense these applications lack true intelligence. Without sentience and being self-aware such AI based applications cannot move forward to attain full intelligence. Hence, Artificial Consciousness built into such applications can lead to artificial super intelligence like human beings.

Consciousness involves awareness of one's environment and existence, anticipation, learning, sentience and sapience that are more difficult to assess unlike intelligence. More precisely, consciousness is subjective experience which is personal or individual and a brain activity. Hence, replicating the brain in a form of artificial consciousness is a challenge. Further, learned behavior or habits by the brain (Robots trained through machine learning) are no longer sufficient for coping with unexpected situations.

Robots that can imitate emotion, be self-aware, be creative and soul-full are far away from possessing artificial consciousness. If machines were ever to be deemed conscious then ethical and legal issues are also to be dealt with.

Ganga Cleaning Action

Date: 17 January 2023

Prof. (Dr.) Mujahid Husain
Professor in Civil Engineering

Rivers are the lifelines of civilizations. Ancient civilizations are grown on the banks of rivers. Today also, though very scarce, river water is a potent resource of water for all beneficial uses.

Ganga is historically, culturally, sociologically and economically important river of India. Its water has unique characteristics. Yet it is getting polluted. In order to maintain the river flow and its purity Ganga Cleaning Action Plan was initiated in 1986. The plan, which can be termed as phase I, was successful in saving the river. The phase II started in 2014 with a name of 'Namami Gange'. It has become one the top ten Flagship Programs of the United Nations to Restore the World.

The river is getting polluted owing to the discharge of domestic and industrial wastewaters into it. The cleaning Program is mainly focused on collection of wastewaters, treatment before it enters into the river, watershed sanitation, solid waste management, etc. It also includes the removal of floating debris from river and development of Ghats. According to CPCB official website the oxygen level everywhere in the river is near saturation, indicating its purity and success of the program.

From Plastic to Monomers

Date: 18 January 2023

Dr. Vijay R. Diware
Associate Professor in Chemical Engineering

It is important to treat plastic waste because it is a major source of pollution. The polyethylene terephthalate (PET) waste is one of the most widely used plastics in the world, used to make single-use beverage bottles and other products. Plastic waste is a non-biodegradable material that can take hundreds of years to break down naturally and it can leach harmful chemicals into the environment. Plastic waste can also clog waterways and kill wildlife if not properly managed. Treating plastic waste involves sorting, cleaning, and recycling the waste to reduce its environmental impact.

It is necessary to apply depolymerization of PET as a chemical recycling method because it is an efficient and cost-effective way to recycle plastic waste. Depolymerization breaks down PET into its individual components, which can then be reused to make new products. This process is also more environmentally friendly than traditional methods of plastic recycling, as it does not produce any harmful by-products or emissions. Additionally, depolymerization is a quicker and more efficient way to recycle plastic than other methods, making it an attractive option for businesses and municipalities.

Automation Techniques in Construction

Date: 18 January 2023

Dr. Pravin A. Shirule
Associate Professor in Civil Engineering

The time is now for automated construction technologies to play a major role in the construction industry. India’s infrastructure forms an integral part of the country’s economic environment. There has been a significant shift in the industry that is leading to the development of world-class facilities in the areas of roads, waterways, railways, airports, and ports, among others. The infrastructure sector is the Indian government's biggest focus area. The government plans to spend 110 trillion ₹ on infrastructure during 2019–23 for the sustainable development of the country. India and Japan joined hands for infrastructural development. This view is proving to be a game changer for automation in the construction industry.

Automation has scope in various fields of construction activity, such as initial planning and design, operation and maintenance, and the eventual dismantling and recycling of engineering structures. Automation is economical to work under dangerous conditions and situations, continuous working and rapid construction at low risk with good quality. In the construction of roads, runways, bridges, high-rise buildings, ports, tunnels, and dams, automation is sustainable and economical. Some examples of automated machines are Putzmeister telebelts, cranes, and tunnel excavators. Automation in the construction industry is a catalyst for economical and sustainable infrastructural development.

Predictive Analytics

Date: 19 January 2023

Dr. Mukesh B. Ahirrao
Assistant Professor in Business Administration

Business houses are experiencing more uncertainty and many challenges like hyper inflation, unemployment, poverty, massive displacement of workers, climate change, health risks & challenges, and supply & logistics issues in the era of post COVID and Ukraine war. As a result, experts are expecting recession in the global market and shrink in profit. Prediction of future outcomes for better informed decision is the key to success in such uncertain environment. Today, data is more than oil to the industries and Data Science and Data Analytics are two buzz words of the year. Predictive analytics is there to help business firm to navigate the uncertainty in environment. Business firms can explore the available data according to the requirement and process it for informed decision making purpose.

This session covered applications of predictive analytics with reference to emerging challenges in different sectors along with process, tools, technique and a case study of regression analysis to understand how it works. This session will be useful to policy decision makers and data experts and creates basic awareness about predictive analytics and how it can be put to work in business firms.

Predictive analytics can help business firm to optimize their operations and ensure better earning visibility.

Innovative Braking System

Date: 20 January 2023

Dr.Prajitsen G. Damle
Associate Professor in Mechanical Engineering

Challenges of braking in hurry are overcome by using technology via. Anti-lock braking systems (ABS), electronic brake force distribution (EBD), brake assist (BA) and cornering stability control (CSC).
Locking of wheels by applying brake quickly and also vehicle will slide rather than rolls to a stop. ABS applied pressure quickly and released at the wheels. This is called Pressure Modulation. This works to prevent wheel locking and sliding.

The weight being supported by the wheels is not evenly distributed. The wheels have a heavier load will require more brake force. EBS system is detecting the weight of each wheel according to that it changes the amount of braking force.

During sharp corning weigh of the vehicle is shifted towards turning side and vehicle may over steer. Brake force will be much higher on the turning side. This will result in vehicle turning to that side and possibly getting off the road. The Cornering Stability Control boosts in when it senses the vehicle is taking on a sharp corner. The CSC will regulate the braking force on each wheel and help the vehicle maintain a straight line instead of over-steering. Technology significantly lowers the risk of wheels locking up and vehicle skidding, especially in slippery conditions.

Process Intensification

Date: 20 January 2023

Dr. Sandeep A. Thakur
Assistant Professor in Chemical Engineering

Modular Chemical Process Intensification processes are more flexible, allowing for more rapid changes in scale or product type. Process Intensification reduces energy and material consumption and helps in moderating the waste from process industries. Process Intensification leads to a diminution of production time and improves heat and mass transfer, reaction kinetics, yield and product quality.

Process Intensification combines reaction and separation into a single piece of equipment resulting in a more efficient, cleaner, and economical manufacturing process. A wide range of unit operations are capable of Process Intensification and Intensified equipment such as novel reactors, separators, and other equipment can be designed to operate at higher temperatures, pressures, and flow rates than conventional equipment.

Multifunctional Reactors, Hybrid Separation, Alternative Energy sources are the key as Industry is looking beyond traditional Chemical Engineering. Process Intensification has several benefits, together with reducing environmental impacts; it improves the efficiency of the process and safety.

Intelligent operations, Processes-Product-Process Engineering (PPP) has the potential to provide solution by unconventional manner. In the competitive global marketplace, by understanding the physical and chemical processes, Process intensification offers promising opportunities for improvement in equipment design, predictive control and optimization through data-driven algorithms.

Life Skills & Professional Development

Date: 21 & 28 January 2023

Devdatta Gokhale, Director
Rashmi Gokhale, Dy. Director
Gokhale's Advanced Training Institute, Jalgaon

Apart from technical skills, other skills are equally important in professional life. Though technical skills induce creativity and critical thinking, still effective communication and cooperation are must among professionals.

In view of this a session is conducted on Life Skills and Professional Development. The session includes Business English Communication, Time Management, Writing Skills, Professional Ethics & Etiquettes.

Virtual Reality

Date: 23 January 2023

Dr. Vijay M. Deshmukh
Associate Professor in E & TC Engineering

Virtual Reality (VR) is new world in which user feel that whatever he is watching is real. User is near to real these near to real atmosphere been achieved due to immersive technology, which is nothing but computer generated three-dimensional (3D) technology. Virtual reality is composed of two main parts –Software, where virtual world is to be created and Hardware, where this world is to be realized with the help of major tools such as Goggles, head phones, head mounted display (HMD) etc.

Virtual Reality has three main categories. Non-Immersive Virtual Reality: In this category where the user simultaneously remains aware and controlled by their physical environment. Semi-Immersive Virtual Reality: This type of VR makes sense for educational and training purposes with graphical computing and large projector systems. Fully Immersive Virtual Reality: This type of VR generates the most realistic simulation experience; it has additional feature that it uses high visual and sound effect devices.

Virtual reality has many applications in military, medical educations architecture and movies. The real professional training in many cases such as medical or military or commercial flights is very risky and costly. By using Virtual reality these factors are minimized. The progress in 20 Gbps internet speed in 5G is golden opportunity in Virtual reality functions, it will perform many applications by using machine in future.

Alternative Processes and Chemical Reactions that can reduce Waste Generation

Date: 23 January 2023

Dr. Nikhil Y. Ghare
Assistant Professor in Chemical Engineering

The chemical industry is one of the most polluting industries in the world. Every year, millions of tons of hazardous waste are produced by chemical plants. Waste reduction is a critical issue for the chemical industry. If not properly managed, waste can cause environmental pollution and health problems locally for people living near chemical plants and globally by affecting the climate and ecosystems.

Membrane Cell Based Chlor-Alkali Production (Non-Hazardous) is developed instead of Mercury Cell in which there is no mercury waste generation. A solid zeolite with acid groups, is now used as catalyst for cumene manufacture which eliminates acid waste generation. This technology is also implemented in polyamide 6 manufacture. In Ammonia manufacture conventional Platinum catalyst process which is costly and hazardous a new catalyst that operates under moderate conditions and only contains carbon and potassium is developed which has the potential to save energy, material and cost in this important industrial process.

As the waste reduction technologies require less material and energy there is reduction in pollution .This helps to protect the health of human beings. There is also reduction in pollution control cost.

Crypto Currency

Date: 24 January 2023

Dr. Vishal S. Rana
Associate Professor in Business Administration

Over the past few years, a new investment asset class is making everybody take notice i.e. Crypto currency. Crypto currency is decentralized digital money based on Block chain technology & secured by cryptography. Bitcoin is known as first crypto currency introduced in 2009 & in 2010 the first real world Bitcoin transaction took place.

Crypto currency benefited to business in many ways as it grow the businesses by attracting new customers, no intermediary and third party involvement, no restrictions on payments. Further no identity thefts, immediate settlement, easy access to everyone are advantages of crypto currency. Some top crypto currencies in 2023 are Ethereum, tether, binance coin, US Dollar coin, Cardano & Polygon etc. The global crypto currency market cap today is $1.09 Trillion.

Some challenges regarding adoption of crypto currency includes lack of awareness, high volatility, Network Congestion, Lack of trust in Digital Currency, Transaction Irreversibility and lack of regulatory framework etc. Though India has been active in the crypto currency market but because of some happenings of recent scams the government is taking a cautious yet determined approach to regulate crypto currency. Considering the investor's interests & growing investments, Crypto definitely seems to be the future.

Memristor

Date: 24 January 2023

Prof. (Dr.) Manish P. Deshmukh
Professor in E & TC Engineering

Memristor is a contraction of memory-resistor. It is a two terminal non-linear component which relates flux and charge. In 1971 LEON CHUA Professor in university of California described it and named it. In 2008 HP developed first pro- totype.It is non-volatile electronic device whose resistance can be programmed. It limits, regulates the flow of current and at the same time remembers how much charge has flowed throught it. It is made up of titanium di-oxide between two metal electrodes. Titanium di-oxide allows integration into electronic circuits with high packing density.

Pro-typeworks on typical cut-off frequency of 35 THz. It has low insertion loss of .3 dB. It also exhibits good linearity and power handling capacity.Definition of memristor is broadened to include any form of non-volatile memory that is based on resistance switching which increases flow of current in one direction and decreases in the other.

It is considered to be a sub-category of resistive RAM which have been predicted to replace Flash Memory. It finds applications in digital memory logic circuits,biological and neuro-morphic system as well as brain computer interface.

IPR Awareness

Date: 25 January 2023

Ms. Pooja Maulikar
Examiner of Patents & Design
Rajiv Gandhi National Institute of Intellectual Property Management
Nagpur

In view of creating awareness about Intellectual Property Rights and Patents, an online session was organized and the resource person was Ms. Pooja Maulikar. The resource person shared information about IPR, Patents and filing patent application.

CAD CAM

Date: 27 January 2023

Dr. Pradeep M. Solanki
Assistant Professor in Mechanical Engineering

The chain of events leading up to the final manifestation of a product has been significantly influenced by the pair of industrial applications known as CAD/CAM, which are frequently interconnected.

The many design fields are outlined, along with how significant CAD/CAM software is to each field. In comparison to non-computerized processes, ongoing improvements in CAD/CAM systems continue to save manufacturers tens of millions of dollars in time and resources. As a result, CAD and CAM technologies have led to enormous increases in output and quality.

Rapid prototyping, a technique that enables businesses to produce and test iterations of products, is made possible by the use of CAD/CAM software, which is utilized in a variety of industries.
CAD attempt to utilize the advancements in computational science to assist medical professionals in interpreting images leading to faster and effective diagnosis.

CAD/CAM Technology scope is very flexible and has a spectrum of exciting employability opportunities in a wide variety of sector. In the future scope artificial intelligence in CAD offers the ability to go over the design and prompt for changes to improve manufacturability.

Internet of Things

Date: 27 January 2023

Prof. (Dr.) Shekhar R. Suralkar
Professor in Computer Engineering

IoT is a network of things or objects that are embedded with sensors, software and other technologies for connecting and exchanging the data to other devices or systems over the internet. The challenges in IoT development at global level are security, cost, reliability, ease of integration, connectivity, development skill set, quality control design. As IoT is one of the emerging technologies and more than 10 billion devices are connected with IoT and by 2025 the experts expect it to grow up to 22 to 28 billion devices and it is accepted globally for connectivity and data transfer which is a very important issue in today's scenario.

The devices connected with IoT range from ordinary household objects to sophisticated industrial tools, the word IoT was introduced by Kevin Ashton in 1999. Things can share and collect data with minimal human intervention. There are many applications of IoT right from common kitchen appliances to latest smart devices in the various sectors like: transportation and logistics, telecommunications, energy, smart cars,smart farming, smart city, IIoT, etc.

The Internet of Things is being widely adopted technology in most of organizations. It helps in achieving things without any manual intervention.

Alternative Energy Sources

Date: 30 January 2023

Dr. Kiran S. Patil
Assistant Professor in Applied Sciences

The Journey of battery from the Lead acid batteries to get raised or advances with Ni-cadmium batteries, Ni-MH (Nickel metal Hybrid batteries), Li-ion batteries and future Li-ion batteries etc..

In lithium-ion (li-ion) batteries, energy storage and release is provided by the movement of lithium ions from the positive to the negative electrode back and forth via the electrolyte. In this technology, the positive electrode acts as the initial lithium source and the negative electrode as the host for lithium i.e. host and guest relationship between two electrodes. Several chemistries have done selection and optimization close to perfection of positive and negative active materials gathered under the name of li-ion batteries. With actual materials and cell designs, li-ion technology is expected to reach an energy limit in the next coming years. The innovative compounds can store more lithium in positive and negative electrodes and will allow for the first time to combine energy and power.

New chemistrieswith elements Li, Na, Mg, Be to help meet the world's ever-increasing need for energy. Sodium-ion, lithium-sulfur and solid-state batteries are waiting in the wings to bring lighter, more powerful and safer energy storage.

Robotics Process Automation

Date: 30 January 2023

Dr. Richa A. Modiyani
Assistant Professor in Business Administration

Robotic Process Automation (RPA) is the use of software with Artificial Intelligence (AI) and Machine Learning (ML) capabilities to handle high-volume, repetitive tasks that previously required a human to perform.
RPA is a program in which sequence of commands are executed as per the predefined rules of organization. It streamlines workflows, which makes organizations more profitable, flexible, and responsive. It also increases employee satisfaction, engagement, and productivity by removing mundane tasks from their workdays.

RPA is the most emerging area of technology which is used to bring out a lot of benefits and scope for developing the applications in different industry niche. With the advancement in RPA and its solution strategy, the organization are now getting a team of Virtual Workforce that are able to complete the tasks in less than 50 seconds, which means an 83% reduction in execution time.

Since RPA has grown within a short period, there are many opportunities to build a career in it. The expansion of this technology can also be seen in sectors other than IT. It is spreading in areas like Banking, Health, Finance, Accounting, Development, etc. The technology is expanding with the combination of AI and ML, which will surely change the phase of future automation tasks.

Role of Mathematics in Machine Learning

Date: 31 January 2023

Dr. Sunita S. Patil
Assistant Professor in Applied Sciences

Machine learning is a buzzword for today's technology, and it is growing very rapidly day by day. We are using machine learning in our daily life even without knowing it such as Google Maps, Google assistant, Alexa, etc. Some most trending real-world applications of Machine Learning are Image Recognition, Traffic prediction, Product recommendations, Self-driving cars Email Spam and Malware Filtering, Online Fraud Detection, Medical Diagnosis, Automatic Language Translation.

Machine learning is a branch of artificial intelligence (AI) and computer science which focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its accuracy. Machine Learning algorithms are the programs that can learn the hidden patterns from the data, predict the output, and improve the performance from experiences on their own.

Mathematics plays important roles in algorithms. It helps in selecting the right algorithm which includes giving considerations to accuracy, training time, model complexity, number of parameters and number of features. The level of mathematics needed to choose the parameter settings and validation strategies, identifying under-fitting and over-fitting by understanding the Bias-Variance tradeoff and estimating the right confidence interval and uncertainty.

Data Visualization

Date: 31 January 2023

Dr. Surendra P. Ramteke
Assistant Professor in Computer Engineering

Tableau is a business intelligence and data visualization tool used by data analysts, data scientists, and business intelligence professionals to explore and visualize data.. It provides a comprehensive suite of tools for creating interactive and visually appealing dashboards and reports, performing complex calculations and analyzing data from multiple sources. Tableau is used by data analysts, business intelligence professionals, and data scientists around the world to better understand their data and make better decisions. Tableau provides a drag-and-drop interface that makes it easy to quickly create powerful visualizations. It supports a wide variety of data formats, including CSV, Excel, and Oracle, and allows users to combine data from multiple sources. Tableau also provides a range of statistical and predictive analysis tools, such as forecasting and clustering. Tableau also offers powerful collaboration and sharing capabilities, allowing users to easily share their visualizations and dashboards with colleagues, stakeholders, and the public. Tableau's cloud-based platform allows users to access their data and visualizations from anywhere, at anytime. Tableau is an extremely powerful tool for analyzing and visualizing data. It provides an intuitive interface, powerful analytics tools, and easy collaboration and sharing capabilities decisions. It can also be used to quickly spot trends and outliers in data and develop predictive models for forecasting future outcomes.

MongoDB

Date: 1 February 2023

Prof. (Dr.) Krishnakant P. Adhiya
Professor in Computer Engineering

MongoDB was founded in 2007 by Dwight Merriman, Eliot Horowitz and Kevin Ryan – the team behind DoubleClick. It is an open-source NoSQL database management software. NoSQL is used as an alternative to traditional relational databases. MongoDB is a tool that can manage document-oriented information, store or retrieve information. The name MongoDB is derived from the English word “HuMONGOus”, which means huge amount of data. Instead of storing data in tables and rows as done with a relational database, in MongoDB we store documents with dynamic schemas. It is a document database in which one collection holds different documents. Number of fields, content and size of the document can differ from one document to another. Documents are the basic unit of data in MongoDB. The documents are similar to JavaScript Object Notation, but use a variant called Binary JSON (BSON). A core function of MongoDB is its horizontal scalability, which makes it a useful database for companies running big data applications. In addition, sharding allows the database to distribute data across a cluster of machines. MongoDB has some limitations also, such as - High Memory Usage, Limited Data Size, Limited Nesting, and no support of joins.

Combedded Systems

Date: 1 February 2023

Dr. Pankaj H. Zope
Assistant Professor in Computer Engineering

Embedded means something that is attached to another thing. It plays an important role in our day to day life, it can be thought of as a computer hardware system having software embedded in it. An embedded system can be an independent system or it can be a part of a large system. It is a processor based system which is designed to perform a specific task.
Communication Interface is essential for communicating with various subsystems of Embedded System and with the external world. Inter system protocols like USB, UART etc establish communication between two communicating devices. The Intra system protocol like I2C, SPI, CAN etc establishes communication between components within the circuit board

External interfaces are typically a product's lifeline to the outside world. Wireless or wired technologies are used to connect devices to one another, the Internet, remote servers, etc. The wireless communication interface includes Infrared (IR), Bluetooth (BT), Wireless LAN (Wi-Fi), Radio Frequency waves (RF), GPRS etc and the wired interfaces includes RS-232C/RS-422/RS 485, USB, Ethernet (TCP-IP), IEEE 1394 port, Parallel port etc.

The communication interface in embedded systems is commonly found in consumer, industrial, automotive, home appliances, medical, telecommunication, commercial, aerospace and military applications.

Recent Trends in IC Engine

Date: 2 February 2023

Dr. Krishna S. Srivastava
Associate Professor in Mechanical Engineering

The Internal Combustion Engines (ICE) categorized as SI and CI Engines, the four key events involved are 4strokes as Air Intake, Compression, Power (Ignition) & Exhaust strokes. IC engines commonly known as heat engines, used in vehicles, boats, ships,trains etc..

The migration from BS IV to BS VI emission norms has enforced the automobile manufactures to adopt the rapid change of technology. The emissions has been reduce to 80% by the use of recent upcoming technology in IC engines. Majority changes were observed in diesel variant starting with ECM, throttle valve, IAC, Actuators, 2 gen. Injector , High pressure EGR, Turbo charger , Exhaust cooler , Ad. Blue technology, DOC /DPF , SCR to T21 sensor,Lamda sensor etc.The reduction in sulphur content in diesel fuel has tremendously dropped the emission level. The 17 popular diesel variants are on hold due to strict RDE - PH2 Norms, OBD is compulsory for all vehicles.

The SI engine in LMV will also update with DEGR system to improve its fuel efficiency by 15%. Flex fuel engine technology is another popular changes India is waiting for. The two wheelers under BS VI norms replaced the carburetor by Injection system, which is a big alteration to get high efficiency and to stop fuel adultration.

The invention of wheel , to gear up power to move it with high efficiency & low cost, is never-ending. Every move or change is a new strat. This is called engine of change that is technology.

Recent Trends in Sentiment Analysis

Date: 2 February 2023

Dr. Dnyaneshwar K. Kirange
Associate Professor in Computer Engineering

Sentiment analysis is the automated process of determining whether a text expresses a positive, negative, or neutral opinion about a product or topic. Sentiment analysis aims at getting sentiment-related knowledge especially from the huge amount of information on the internet. Sentiment analysis consists of cognitive science, machine learning and natural language processing. Sentiment analysis task is not only limited to classifying the text as positive or negative, it can further extended for assigning polarity as well as aspect based sentiment analysis.

Sentiment analysis is getting better because social media is increasingly more emotive and expressive. For companies, social media comments have become the voice of customers and segment analysis. Customers use social media to express their thoughts on any product. It captures customers' complaints about a product and enables business leaders and analysts to fix bugs and issues and improve their products based on customers' needs. In 2020,54% of companies had adopted the technologies for analyzing customers' sentiment from their reviews or social media, which is expected to exceed 80% in 2023. Sentiment analysis can also be applied in various areas including educational data mining, feedback analysis etc.

Cyber Security

Date: 3 February 2023

Dr. Manoj E. Patil
Associate Professor in Computer Engineering

Security of information becomes the most important for every organization and individual as a member of cyber space (connected to internet). As the systems are connected with internet will increase the risk of being attacked and loss of information.

To keep the information safe and secure everyone should know about the threats to the information and systems of the organization.
A computer that is not having appropriate security controls can be infected with malicious logic and thus any type of information can be accessed in moments. Number of infected Web Pages and malicious websites can be seen every day that infects the computer and allow hackers to gain illegal access to other computer systems. Cyber threats can be caused due to negligence and vulnerabilities, or unintentional accidents. Nevertheless, they can also be planned or intentional, like hacking or access by unauthorized users. System attackers can be terrorists, crackers or recreational hackers.

The basics of cyber security along with the type threats like Malware, Virus, Trojan, some online fraud related information along with precautions and counter measures to be taken are covered in presentation.

The information related to cyber security is important for everyone who is a part of cyber space. Global connectivity and new emerging applications like Metaverse will increase the need of cyber Security.

Hybrid Electric Vehicle and it's importance

Date: 3 February 2023

Dr. Nafees M. Kazi
Assistant Professor in E & TC Engineering

The word “hybrid” is a Greek word and means “from two origins”. Accordingly, a hybrid vehicle obtains its energy from two different sources and therefore has more than one drive system: generally, an electric motor and an internal combustion engine – usually with gasoline as fuel; diesel is less common. The aim of a hybrid drive is to combine the advantages of both drive systems and balance out their disadvantages. Currently, the main benefit of a car with a gasoline or diesel engine compared to an electric drive system is its range. This is not because of the motor itself, but due to the energy storage unit: the battery. As batteries become more efficient, the range will increase. A car with an electric motor does not produce local exhaust gases or noise, and it doesn’t use fossil fuels, provided the electricity comes from renewable sources. With electric motors, acceleration is also faster and more dynamic.

Regenerative braking is a simple process used by self-charging hybrid cars. It allows them to recharge their batteries using braking power. During the process of regenerative braking, kinetic energy that may otherwise be wasted is converted into electrical energy. This is then returned to the battery and battery will be charged.

Battery Basics

Date: 4 February 2023

Vijay S. Pawar
Associate Professor in Electrical Engineering

Battery is a ubiquitous device. In the context of nonconventional energy sources such as Solar Energy and Wind Energy technology, batteries play an important role .Solar and wind technology do not produce power in a consistent way throughout the day, throughout the year. Therefore it is very necessary to have an energy storage device like a battery which stores energy when more power is generated and returns back to the system when there is demand. Battery Basics provides information about its chemistry, functions, components and processes. Battery is an electrochemical device, having electrode phase, electrolyte phase and transfer of charge. Demand is growing quickly as they are adopted in electric vehicles and grid energy storage applications. Lithium, Nickel, Cobalt, Manganese, Aluminum, Iron, and Phosphate are used as cathode to store more charge in a battery. The c rate provides more information about discharge or charge, relative to its capacity. The terms associated with a battery are state of charge, depth of discharge and number of cycles. These are used to measure battery performance. Latest developments in battery technology provides a range of improvements over conventional technologies, such as specific energy and energy density, longer life , battery safety and less time for charging

Energy Conservation: A Case Study

Date: 4 February 2023

M. Mujtahid Ansari
Assistant Professor in Electrical Engineering

Energy conservation refers to efforts made to reduce energy consumption. Energy conservation can result in increased financial capital, environmental quality, national security, personal security and human comfort. Industrial and commercial users can increase energy use efficiency to maximize profit.

Electrical energy conservation is an important element of energy policy. Energy conservation reduces the energy consumption and energy demand per capita and thus offsets some of the growth in energy supply needed to keep up with population growth. This reduces the rise in energy costs and can reduce the need for new power plants and energy imports. This reduced energy demand can provide more flexibility in choosing the most preferred methods of energy production. The strategy developed to make power available to all includes promotion of energy efficiency and its conservation in the country, which is found to be the least cost option to augment me gap between demand and supply.

Considering the vast potential of energy savings and benefits of energy efficiency, the Government of India enacted the Energy Conservation Act, 2001. The Act provides for the legal framework, institutional arrangement and a regulatory mechanism at the Central and State level to embark upon energy efficiency drive in the country. The progress made by India in energy conservation can be seen in three areas: (A) Policy and Institutional (B) End Users (C) Technology.

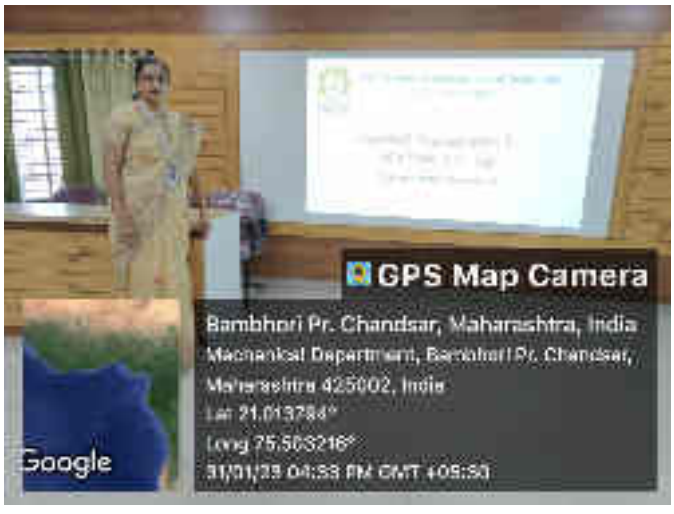
Glimpses


GPS Map Camera
Bambhori Pr. Chandsar, Maharashtra, India
N H 06 Bambhori, Bambhori Pr. Chandsar, Maharashtra 425002, India
Lat 21.014182°
Long 76.602627°
24/01/23 06:00 PM GMT +05:30
Google


GPS Map Camera
Bambhori Pr. Chandsar, Maharashtra, India
2G83+24R, Bambhori Pr. Chandsar, Maharashtra 425002, India
Lat 21.014848°
Long 76.602628°
27/01/23 04:21 PM GMT +05:30
Google


GPS Map Camera
Bambhori Pr. Chandsar, Maharashtra, India
2G83+24R, Bambhori Pr. Chandsar, Maharashtra 425002, India
Lat 21.014849°
Long 76.60262°
27/01/23 04:28 PM GMT +05:30
Google


GPS Map Camera
Bambhori Pr. Chandsar, Maharashtra, India
N H 06 Bambhori, Bambhori Pr. Chandsar, Maharashtra 425002, India
Lat 21.013675°
Long 76.602627°
31/01/23 04:53 PM GMT +05:30
Google


GPS Map Camera
Bambhori Pr. Chandsar, Maharashtra, India
Mechanical Department, Bambhori Pr. Chandsar, Maharashtra 425002, India
Lat 21.013784°
Long 75.503216°
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Google


GPS Map Camera
Bambhori Pr. Chandsar, Maharashtra, India
2G73+XQP, Rd Number 3, Bambhori Pr. Chandsar, Maharashtra 425002, India
Lat 21.013674°
Long 75.501934°
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