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Add-on course on Software Essential Development

Activity Report

Academic Year	2023-24
Program Driven by	
Quarter	IV
Program / Activity Name	Add-on course on Software Essential Development
Program Type	Innovation
Program Theme	Add-on course on Software Essential Development
Start Date	26-08-2024
End Date	28-08-2024
Duration of the Activity (in Hrs)	16
Number of Student Participant	290
Number of Faculty Participant	12
Number of external Participant	--
Expenditure Amount in Rs.	
Any Remark	--
Mode of Session Delivery	Online & Offline
Objective	
Benefit in terms of Learning / Skills / Knowledge obtained	
Feedback	Nice Session
Video url (mp4)	
Photograph 1 (jpg)	Attached
Photograph 2 (jpg)	Attached
Overall report of the Activity (pdf)	As given below

"Software essential development" can refer to the fundamental aspects of software development that are critical for creating functional, efficient, and maintainable software. Here are some key concepts and practices that are essential for software development:

1. Requirements Gathering

- **Understanding User Needs:** Clear requirements are essential to guide the development process. This involves working closely with stakeholders to identify what the software should achieve.
- **Functional vs. Non-Functional Requirements:** These requirements define what the software does (functional) and how it should perform (non-functional, such as security, performance, and usability).

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2. System Design

- **Architecture:** The overall structure of the system, including how different components interact with each other.
- **Design Patterns:** Reusable solutions to common problems in software design, such as MVC (Model-View-Controller), Singleton, and Observer patterns.

3. Version Control

- **Git and GitHub/GitLab:** Version control systems are essential for managing code changes, enabling collaboration, and tracking progress.
- **Branching Strategies:** Techniques like Git Flow help manage the development process, allowing for parallel development and stable releases.

4. Development Methodologies

- **Agile:** A flexible, iterative approach to software development that emphasizes collaboration, customer feedback, and small, frequent releases.
- **Scrum/Kanban:** Frameworks within Agile that provide structure to the development process, focusing on time-boxed sprints or continuous workflow.

5. Programming Languages and Frameworks

- **Choice of Language:** Depending on the project, languages like Python, Java, C#, or JavaScript may be chosen for development.
- **Frameworks:** Tools like React, Django, or Spring provide a foundation for building applications, reducing development time.

6. Testing

- **Unit Testing:** Testing individual components to ensure they work as expected.
- **Integration Testing:** Ensuring that different components work together.
- **Automated Testing:** Using tools like Selenium or JUnit to automate repetitive testing tasks.

7. Continuous Integration and Deployment (CI/CD)

- **Automated Build and Deployment:** Tools like Jenkins, Travis CI, and Docker help automate the process of building, testing, and deploying software.
- **DevOps Practices:** Bridging the gap between development and operations to ensure smooth deployment and monitoring.

8. Code Quality and Documentation

- **Code Reviews:** Peer reviews to catch issues early and ensure code quality.
- **Documentation:** Writing clear documentation for both users and developers is crucial for long-term maintainability.

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9. Security

- **Secure Coding Practices:** Ensuring that code is written with security in mind, preventing vulnerabilities such as SQL injection, XSS, and CSRF.
- **Encryption and Authentication:** Protecting data and ensuring that only authorized users can access the system.

10. Maintenance and Support

- **Bug Fixing and Updates:** Post-deployment, ongoing maintenance is essential to fix issues and keep the software up-to-date.
- **User Support:** Providing support to users to ensure they can effectively use the software.

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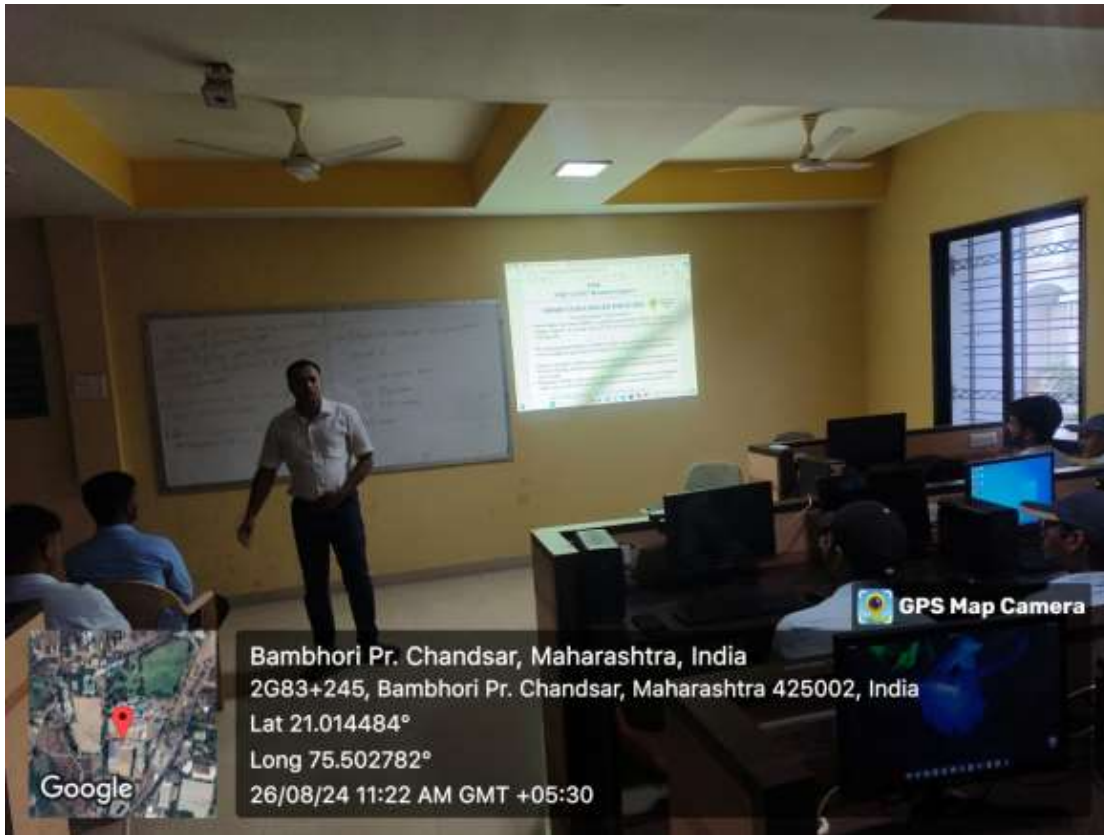Long 75.502782°
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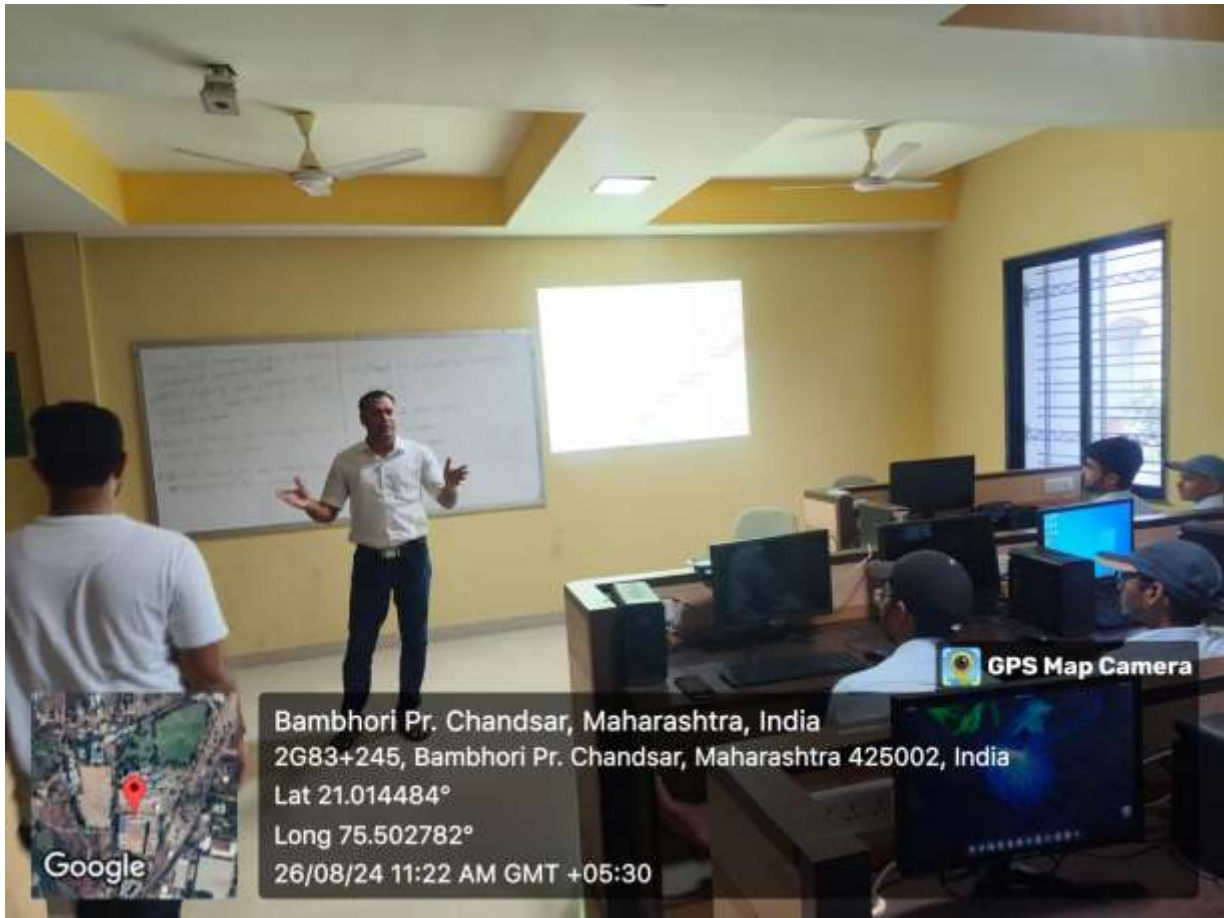Long 75.502782°
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Dr. P. H. Zope