5.6 INNOVATIONS BY THE FACULTY IN TEACHING AND LEARNING (10)

In the Department of Computer Science and Engineering, much importance is given for incorporating innovative techniques in teaching. During the beginning of every semester, a refresher program is conducted to share the innovative practices followed by other faculties pertaining to a new/enriched course offered in the semester. Such brainstorming sessions help transfer the best practices amongst faculties in the department. Pedagogies, Innovative Assessments, Assignments, Content-out-of-Syllabus are typically discussed in the sessions. A snip of one of the meetings conducted for one of the courses "Problem Solving using Computer Programming" is depicted in fig. Faculty members use the LCD Projectors for their presentations. The faculty members use these aids to take the teaching learning process to the next level.

Lectures are presented by faculty members using a variety of teaching tools such as chalk and board, PowerPoint presentation, video lectures, models, charts, animation, and other teaching techniques such as lecture, group discussion, seminar, tutorials, guest lectures, and demonstration. Apart from this, the following are the various innovative practices followed at CSE department to enhance Teaching- Learning.

Summary of Innovative Teaching techniques in Teaching Learning Process

SL NO	ITEM	DESCRIPTION
1	Project based Learning	As part of their courses in each semester, students will complete a project-based learning and these will be graded using the rubrics. Open Day will be organized at the END of each semester; PROJECT EXHIBITIONS are held to display the project-based learning (PBL) work completed by students. The project demonstrates the students' capacity to put their knowledge of various real-world issues to use in solving them. Numerous initiatives in the burgeoning fields of Artificial Intelligence & Machine Learning, Network Information Security, Network Security and Forensics, Parallel Computing, Computer Architecture, Voice Security, Propagation Channel Modeling, Brain Computer Interface, Cloud Computing, Data Analysis and Image Processing, Soft Computing, Wireless Networks, Parallel Computing, Cyber Security, Computer Network, Software

		Engineering, Cloud Computing, etc. Link : https://bitswgl.ac.in/cse/comuter-science-engineering-college
2	Modern Tools Usage (ICT)	LCD Projectors, Speakers, Systems with Keyboard and mouse, power point presentation, Laser Pointer, Slide changer, writing pads, Wi-Fi enabled classrooms and other student learning environments. Wifi enabled Tools Link : https://bitswgl.ac.in/cse/comuter-science-engineering-college
3	Innovative Learning practices	Various cutting-edge techniques, such as activity-based learning and project-based learning, were discussed throughout the lecture sessions. IoT role playing and brainstorming Assignments, Application Development, Poster Presentation, Mooc Course, Presentation, Poster Design, Partial Delivery, and Mini Project Review , Group Seminar, Collaborative Learning Link : https://bitswgl.ac.in/cse/comuter-science-engineering-college
4	Quality course materials	The digital library has expert video subject lectures given by a variety of notable resource people, which makes it easier for professors and students to use NPTEL's E-Tutorials, MOOCs, and other online resources. E-Studio Link : https://bitswgl.ac.in/cse/comuter-science-engineering-college
5	Industry Visits	Industry Visits will be organized once in a semester for delivering the practical exposure to the students Industry Visit Link : https://bitswgl.ac.in/cse/comuter-science-engineering-college
6	Internship	Internship will be conducted during the semester end before the start of next semester .student will be trained on the industry-oriented skills some of the students will be sent to the industry/company/organization for conduction the internships Internship Link : https://bitswgl.ac.in/cse/comuter-science-engineering-college
7	InnovativeMethodsofTeachingAdopted	• **Mind mapping**- A visual thing used for disseminating complex information to the students is used for some of the subjects

		• **Role playing** - Students are asked to complete the task by role playing by interacting with their peers and try to complete the task assigned to them in their specific role Link : https://bitswgl.ac.in/cse/comuter-science-engineering-college
8	Online platform	Faculty members use Google Drive, Google class rooms, Google forms and other platforms such as YOUTUBE URL : https://bitswgl.ac.in/cse/comuter-science-engineering-college
9	Open/Industry Courses/Skill/Enhancement Courses	These activity are provided by the ISE department for a set time during the academic year. Here, the student's proficiency with tools and software used in industry was improved. Open courses Link : https://bitswgl.ac.in/cse/comuter-science-engineering-college

- ❖ Innovations by the faculty in teaching and learning shall be summarized as per the following descriptions and contributions to the improvement of student learning.
- ❖ These activities may include innovations such as ICT, instruction delivery, instructional methods, assessment, evaluation and inclusive class rooms that lead to effective and efficient instructions.
- ❖ The Department/Institution may set up appropriate processes for making the contributions available to the Stake holders for review and rewards.
- ❖ These may typically include statement of clear goals, adequate preparation, use of appropriate methods, effective presentation and reflective critique.

Innovations by the faculty in teaching and learning are as follows:

A)Project based Learning

As part of the courses in each semester, students will complete a project-based learning and these will be graded using the rubrics. Open Day will be organized at the END of each semester; PROJECT EXHIBITIONS are held to display the project-based learning (PBL) work completed by students. The project demonstrates the students' capacity to put their knowledge of various real-world issues to use in solving them. Numerous initiatives in the burgeoning fields of Artificial Intelligence & Machine Learning, Network Information Security, Network Security

and Forensics, Parallel Computing, Computer Architecture, Voice Security, Propagation Channel Modeling, Brain Computer Interface, Cloud Computing, Data Analysis and Image Processing, Soft Computing, Wireless Networks, Parallel Computing, Cyber Security, Computer Network, Software Engineering, Cloud Computing, etc.

Fig: Project based learning Faculty Presenting the major project Development in Project lab students can also Access the ICT tools .

B) Modern Tools Usage (ICT)

LCD Projectors, Speakers, Systems with Keyboard and mouse, power point presentation, Laser Pointer, Slide changer, writing pads, Wi-Fi enabled classrooms and other student learning environments. Wifi enabled Tools

Faculty use ICT tools in delivering the presentations of various Emerging technologies to students, student can Access the tools in presenting the Seminars as a part of Technical Seminars.

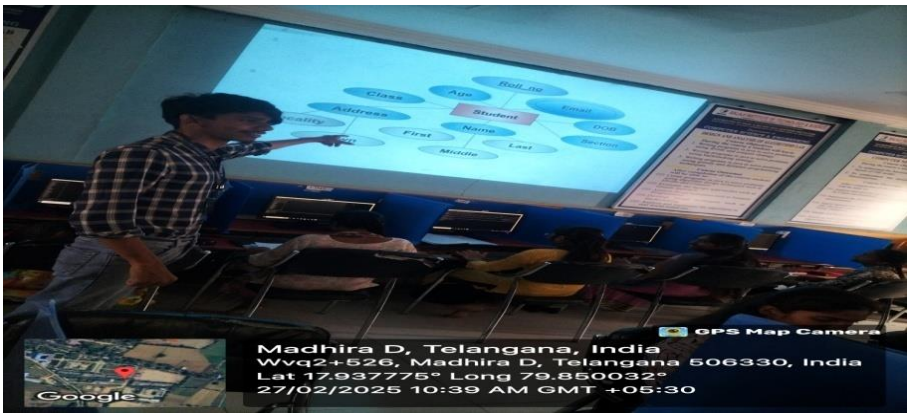


Fig: Students presenting the Technical Seminar Presentation using LCD Projectors as a part of modern tool usage .

C) Innovative Learning practices

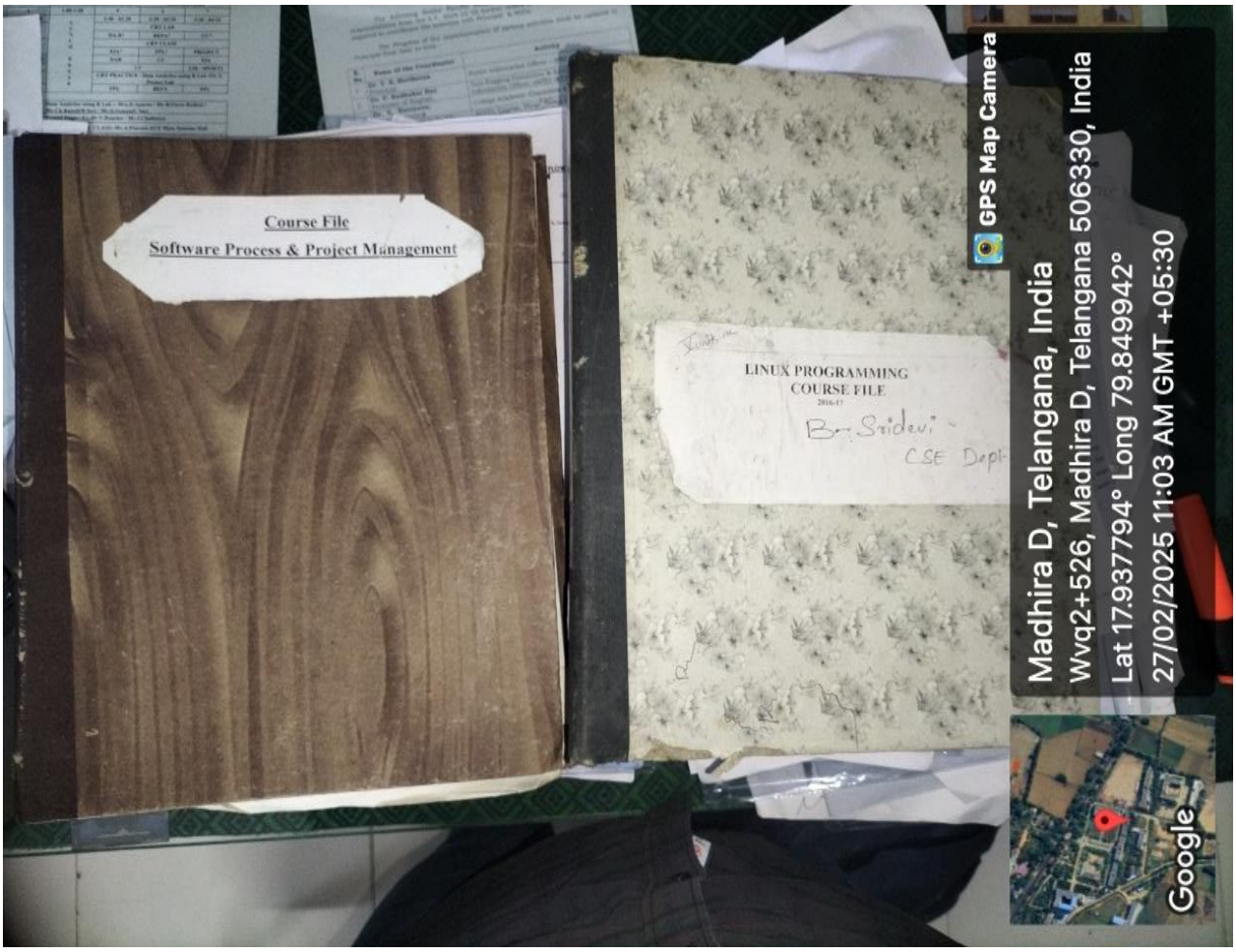
Various cutting-edge techniques, such as activity-based learning and project-based learning, were discussed throughout the lecture sessions. IoT role playing and brainstorming Assignments, Application Development, Poster Presentation, Mooc Course, Presentation, Poster Design, Partial Delivery, and Mini Project Review , Group Seminar, Collaborative Learning

Fig: Students Presenting Group Seminar as a Part of Innovative learning practice.

D) Quality course materials

The digital library has expert video subject lectures given by a variety of notable resource people, which makes it easier for professors and students to use NPTEL's E-Tutorials, MOOCs, and other online resources.

Faculty Provide the Course Materials on the Lecture they delivered As A part the Students are Encouraged to Enrol in NPTEL courses to enhance their knowledge.



E) Industry Visits

Industry Visits will be organized once in a semester for delivering the practical exposure to the students Industry Visit.

Students have visited ISRO space station as a part of industrial visit, which give a practical and real view Knowledge Exposure.

After this Visits students can deliver knowledge what they gained in Visit after Reaching the college in the form of Presentation .

Fig: Students Visited ISRO as a part of IndustrialVisit .

F) Internship

Internship will be conducted during the semester end before the start of next semester .student will be trained on the industry-oriented skills some of the students will be sent to the industry/company/organization for conduction the internships Internship.

Students have completed the Internships on their interested areas in online mode which helps them in cracking the placement platforms like (Task, Edunet, Skill india).

G) Innovative Methods of Teaching Adopted

i. **Mind mapping**- A visual thing used for disseminating complex information to the students is used for some of the subjects

ii. **Role playing** - Students are asked to complete the task by role playing by interacting with their peers and try to complete the task assigned to them in their specific role.

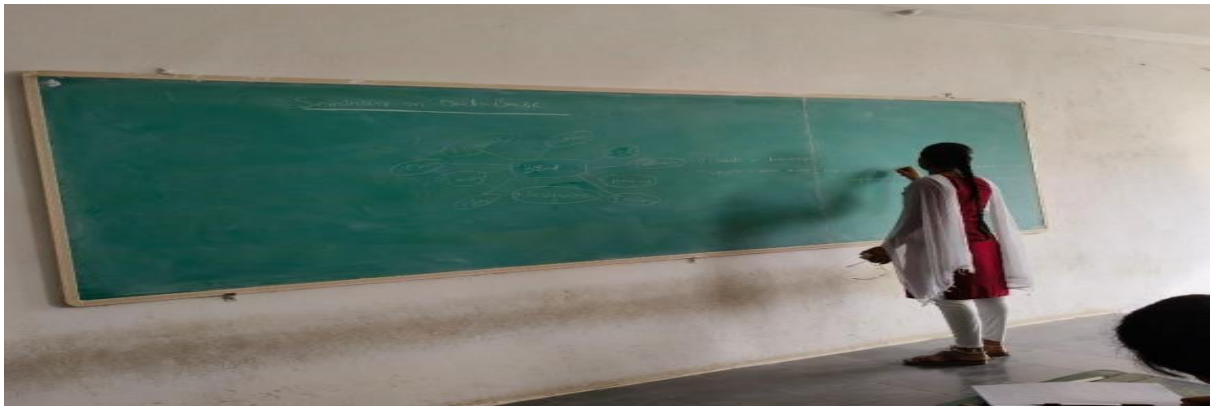
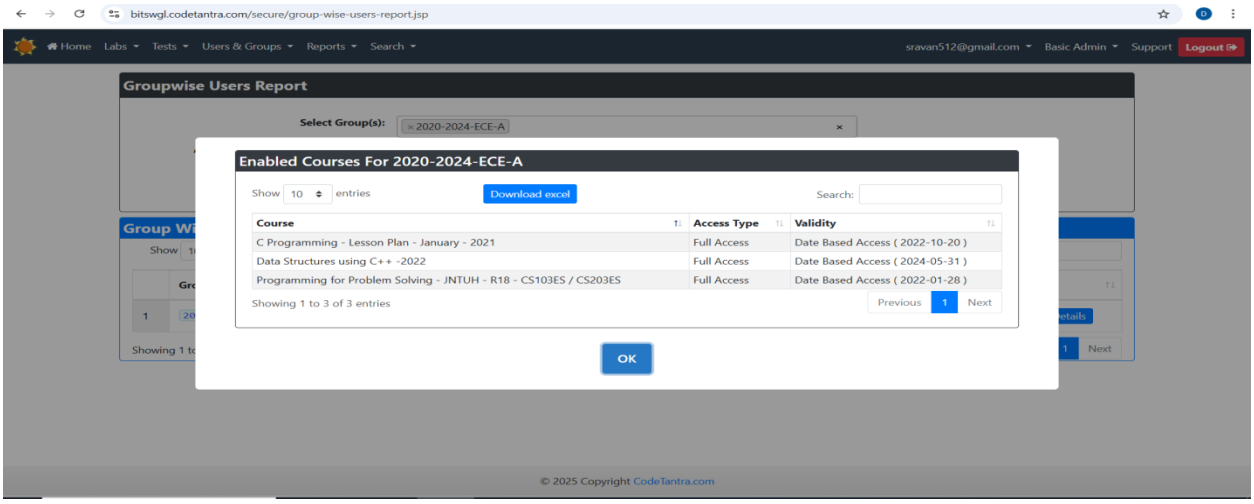


Fig: As Part of Innovation Teaching Methods Student Explaining the complex Problem in Data Base.

H) Online platform

In the modern educational landscape, leveraging online platforms has become essential for effective teaching and learning. Faculty members utilize a suite of Google tools, including Google Drive, Google Classroom, and Google Forms, to create a seamless and interactive learning environment. Google Drive serves as a centralized repository for storing and sharing course materials, ensuring easy access for students. Google Classroom streamlines communication, assignment distribution, and grading, fostering collaboration between faculty and students. Google Forms enables the creation of quizzes and surveys, allowing educators to assess student understanding and gather feedback efficiently.

https://bitswgl.codetantra.com/secure/group-wise-users-report.jsp



Students can Access the College Online Codetantra Assessment includes Coding &Assessment Tests use full in Placements

I) Open/Industry Courses/Skill/Enhancement Courses

The Department of Computer Science and Engineering (CSE) offers Open Courses, Industry-Oriented Programs, and Skill Development Initiatives as part of its commitment to bridging the gap between academia and industry. These courses are strategically designed and conducted throughout the academic year to provide students with hands-on experience in industry-relevant tools, software, and technologies.

Through these programs, students gain proficiency in programming languages (Python, Java, C++, JavaScript), data structures and algorithms, cloud computing (AWS, Azure, Google Cloud), machine learning and AI frameworks (TensorFlow, PyTorch), cybersecurity, blockchain, DevOps, and full-stack development. Additionally, courses on data analytics, IoT, and emerging technologies ensure students stay ahead in the ever-evolving IT and software industry.