DEPARTMENT OF E&TC ENGINEERING

Innovations by faculty in teaching and learning

The institute uses student-centered teaching methods to provide quality technical education. These include hands-on learning, group activities, interactive sessions, project work, and problem-solving tasks. Such methods are used both inside and outside the classroom to make learning more engaging and meaningful. This approach helps students take active part in the learning process, improves their creativity, and builds their ability to solve real-world problems.

Smart classrooms, virtual classrooms, audio-visual equipment, and other ICT facilities are well- equipped at the college and are frequently used by teachers in daily instruction to interest students to the subject. Students engagement in group discussions, tests, and seminars encourages interactive learning. Eminent academics give special lectures on subjects relating to the curriculum to further enhance the learning opportunities for the students.

The main aim of the teaching-learning process is to help students gain the knowledge and skills needed as per industry and academic standards. Faculty members use different innovative teaching methods to create the best learning environment for students. In order to improve students' learning experience aside from traditional classroom teaching, the department uses novel concepts and their subsequent execution by means of quantifiable programs. The department is continuously striving to:

• Enrich student learning by innovative practices.

• Develop students' comprehension and expertise of creative methods and strategies.

• Broaden students' perspective of emerging technologies and tools contemporary and social issues by innovative strategies. in academics,

• Motivate students to innovatively think, formulate and perform through different club activities

The work is available on the institute's website for reference and review the link for the same is given below.

https://dypsoe.dyptcmis.com/notesdistribution/notes_faculty_showdocs.aspx?Instid=6732etc%3f9133

These practices are listed in Table 5.5.1

Table 5.5.1: Teaching Learning Methods

Sr.No	Teaching Learning Methods	Activities carried out
1	ICT Based Teaching Learning	You Tube NPTEL Links
2	Digital Social learning Platform	Google Groups, Google Classroom , Whats app
3	Physical Social Learning Platform	IETE Student Chapter, Guest Lecture
4	Technical Social Program	Technical Social Program Conducted by other department
5	Exposure of faculty to Industry	Interaction with Industry, Faculty Industry Visit
6	Proactive teaching Learning	Role Plat /Education games, quiz
7	Projects	Sponsored Projects , Mini projects , Avishkar
8	Industry Institute Interaction	MoUs , Industrial Visits.
9	You Tube Channel	Content Sharing

Faculty members actively utilize Information and Communication Technology (ICT) tools to enhance both classroom and laboratory learning, making the teaching-learning process more engaging and effective. Traditional methods are supplemented with modern ICT resources, reflecting the institute's commitment to continuously improving the academic experience.

The work is available for peer review and critique through Google Classroom and YouTube Channel.

The various innovative practices used in teaching and learning by faculty are listed below:

Sr.No.	Innovative Practices	Outcome
1	**E-content on You tube:** Faculty has also created their own YouTube Channels and Google drives wherein they upload study material relevant to their own subjects and also student activity related programs are uploaded on the channel. The links are shared with the students and the contents are openly accessed by all students.	This has helped students to learn and understand the course in a better and effective way. The students can learn at their own pace and at own convenience apart from classroom learning. This provides students, the opportunity for self-study
2	**Online teaching and learning resources on Google Classrooms:** The faculties have their own Google Classrooms where they share with the students the study material, assignments, PPTs, Recorded Videos, e-books etc.	The platforms helped the students to get the study material, interact with the faculty, solve and submit assignments and enhance their thinking ability through the tests as well as quiz sessions conducted by

		almost every faculty member.
3	**Virtual labs:** Vlab for various courses are conducted online on web browsers with the help of simulators. Such online facilities are called as virtual labs (http://www.vlab.co.in/) , and are a part of an excellent innovative initiative taken by the MHRD of India.	Remote-access to simulation based Labs in various disciplines of Science and Engineering. Use of virtual labs inspires students to conduct experiments with their curiosity. This helps them in learning basic and advanced concepts through remote experimentation. It provides a complete Learning Management System around the Virtual Labs where the students/ teachers can avail the various tools for learning, including additional web-resources, video-lectures, animated demonstrations and self-evaluation.
4	**Industry Visits:** Students are exposed to latest developments through regular visits to industry. Faculties organize industrial visits under One Faculty One Industry Programme	It contributes to students' knowledge and opportunity for self-study
5	**Student Chapter/Club Activities:** The department has IETE Student professional chapter, which provide a good platform for the students to take active part in the various competitions, seminars and lectures arranged by the society. The activities help the students to showcase their talents in terms for team building, communications skills, team work, target work and overall development in professional activities. Two faculty advisor are associated with student chapter for mentoring, guidance and overall governance .There are 35 student members associated and 22 faculties with the student chapter.	Enrich students learning skills like communication, presentation, leadership etc.

The work can be reproducible and developed further by other scholars using following innovative techniques

1. Project Based Learning:

PBL has been introduced for SE students with the goal of motivating students to learn by working cooperatively in groups to solve a problem. PBL is a student-centered pedagogy that employs a dynamic classroom approach in which students are believed to gain a deeper understanding through active exploration of real-world challenges and problems. Students

gain knowledge about a subject by investigating and responding to a complex question, challenge, or problem over time. It is an inquiry-based and active learning style. Problem-based learning will also alter the role of the teacher as a mentor in the learning process.

Outcome: PBL encourages students to develop a balanced, diverse approach to solving real-world problems, both on their own and in a team. Institute level PBL competition help students to provide interdisciplinary approach and solution to real world problems.

2. Cutting-edge initiative: Today's education system is rapidly evolving in order to introduce new teaching techniques and strategies that promote a culture of diversity and inclusion. Similarly, each teacher has a distinct teaching style. However, all teachers have the same goal: to instill a love of learning in their students. Department have a few Cutting- edge initiatives as given below that use modern technology ex. Avishkar Hakathon, Unnat Bharat Abhiyan

3. Conference: International and national level conferences provide the platform to the researchers to publish their work and get suggestions from the experts.

Outcomes of Innovative Practices used by Faculty in Teaching and Learning: There are several potential outcomes of innovative practices used by teachers in teaching and learning:

1. Increased student engagement: Innovative practices often involve interactive and hands-on activities that capture students interest and make learning more enjoyable. This result in increased engagement and participation in the classroom.

2. Improved critical thinking skills: Innovative teaching methods encourage students to think critically, solve problems, and analyze information. This lead to the development of higher-order thinking skills and a deeper understanding of the subject matter.

3. Enhanced creativity: Innovative practices often provide opportunities for students to express their creativity and explore different perspectives. This helps foster a sense of curiosity, imagination, and originality among students.

4. Personalized learning experiences: Innovative practices tailored to meet the individual needs and learning

styles of students. This result in personalized learning experiences that cater to each student's strengths, interests, and motivations.

5. Increased collaboration and communication skills: Many innovative teaching practices emphasize collaboration and teamwork. These help students to develop effective communication skills, as well as the ability to work well with others and contribute to group discussions.

6. Long-lasting knowledge retention: Innovative practices that involve active learning and real-world applications help students to retain knowledge for a longer period of time. By connecting new information to practical experiences, students are more likely to remember and understand the concepts being taught.

7. Preparation for the future: Innovative practices often incorporate the use of technology, which is becoming increasingly important in today's society. By integrating technology into

the classroom, teachers can help prepare students for the future workforce and equip them with the necessary skills for success in the digital age.

8. Learning Outcomes: Innovative teaching practices have the potential to enhance learning outcomes for students. By incorporating new and diverse instructional strategies, such as problem-based learning, flipped classrooms, or project-based assessments, educators can facilitate deeper understanding, critical thinking, and the development of practical skills in students.

9. Motivation and Interest: Innovative practices often help to stimulate student's motivation and interest in the subject matter. By embracing new technologies, or real-life applications, faculty create a more vibrant and captivating learning environment. This increased interest lead to improved academic performance and a passion for lifelong learning.

10. Faculty Development: Implementing innovative teaching practices requires faculty to continuously update their knowledge and skills. It promotes professional growth and development, encouraging faculty members to explore new teaching methods, experiment with different instructional tools, and collaborate with colleagues. This ongoing professional development contributes to a positive academic culture in institution.

11. Institutional Reputation: By adopting innovative practices in teaching and learning, educational institutions enhance their reputation and attract students, faculty, and funding. Institute is seen as leaders in the education field and benefited from increased enrollment, improved rankings, and positive perception among stakeholders.

12. Student Success and Well-being: Innovative practices also have a positive impact on student success and wellbeing. By incorporating strategies that address different learning styles, assist diverse student populations, and promote inclusivity, faculty creates a supportive and inclusive learning environment. This contributes to improved student retention rates, satisfaction, and mental health.

13. Research and Innovation: Innovative teaching practices often go hand in hand with research and innovation in education. Faculty who embrace innovative practices are more likely to engage in educational research, explores new methodologies, and contributes to the advancement of knowledge in their field