

### Innovations by the Faculty in Teaching and Learning

Sr. No.	Innovative Teaching Learning Techniques	Activities	Objective	Outcome
1.	Use of ICT	Teaching Learning Process (TLP) conduct	To make effective use of ICT for Teaching Learning process before pandemic and during pandemic	<ul style="list-style-type: none"> <li>• Conduct of TLP with integration of OBAR model</li> <li>• Use of different tools like Smart board, Projectors and Internet connectivity for interactive learning</li> <li>• Conduct of online TLP with use and integration of different online platforms like licensed version of Zoom &amp; MS Team.</li> <li>• Lectures are conducted in online mode using online platforms like licensed Zoom and Microsoft (MS) team.</li> <li>• For some subjects faculty has encouraged the students to perform the practical on simulator/ online compilers/mobile editors/IIT virtual labs (e.g. Database management systems, Computer Graphics using IIT virtual laboratory, Digital Logic Design on virtual laboratory).</li> <li>• Pen tablets, headsets and cameras are used to enhance course delivery.</li> </ul>
		Google Classroom creation E-resource sharing	To effectively share resources with students for knowledge enhancement	<ul style="list-style-type: none"> <li>• Google Class Room to distribute and grade subject assignments in a paperless way. E-Platform to provide study material</li> <li>• Students are assigned with Gsuit Ids, teaching materials are shared through Google class Rooms (GCR). Assignments are posted and accessed in GCR. Quizzes conducted through Google forms and MS forms.</li> <li>• Along with a playlist, module-wise question bank and interactive presentations are also prepared and shared with the students on a timely basis.</li> <li>• All the subject incharges have created a resource book, lab manual and notes for their respective subjects. The material is shared with the class through an ERP (the software used by students as well as faculties for attendance and notes sharing primarily), Microsoft Teams and Google Classroom.</li> <li>• E-journals are available in central library</li> </ul>
2.	Instruction delivery & Instruction method	Co-teaching with industry experts	To enhance students learning through industry experts	<ul style="list-style-type: none"> <li>• Industry experts from each subjects are invited for conducting sessions for encouraging students and creating awareness about latest trends and techniques related to subject.</li> </ul>
		Blended learning	To provide students with ease of teaching	<ul style="list-style-type: none"> <li>• Blended Learning is a combination of learning methods that incorporate multiple teaching methodologies which includes e-learning as well as traditional face-to-face learning. A</li> </ul>

			learning process through pandemic	blended learning approach ensures that the student is engaged effectively.
		Flipped classroom	To enable students to have an active learning environment	<ul style="list-style-type: none"> <li>The flipped classroom inverts the traditional learning experience. Lectures are shared outside of class time for individual review as homework, and classroom time is reserved for class discussion and interactive projects. This helps in making the classroom as an active learning environment &amp; enable students to learn at their own pace.</li> </ul>
		Design based and group activity experiments.	To enhance student's knowledge through collaborative learning	<ul style="list-style-type: none"> <li>The experiment list is categorized into 4 parts, Basic experiments, Design experiments, advanced experiments and Case Study/ Mini Project/ Presentation. Capstone projects have also been introduced under Professional Electives. For the last category of Case study/Mini Project/Presentation students are asked to form a group of 2-3 within the batch for performing the case study/ Mini Project/Presentation as the subject.</li> <li>To keep the students focused and inculcate good learning habits among the students, Innovative teaching learning techniques are initiated by introducing various <b>group learning</b> activities, technology courses for the subject and by designing subject experiments at different levels.</li> </ul>
		Think Pair Share activity for classroom teaching.	To enable students to learn problem solving through sharing with peers	<ul style="list-style-type: none"> <li>In Think Pair Share method students work together to solve a problem or answer a question about an assigned reading. Students think individually about a topic or answer to a question; or share ideas with classmates after discussing with a partner maximizes participation, focuses attention and engages students in understanding the concept learned.</li> </ul>
		Role Play Based Teaching	To provide students with opportunities to learn and develop skills in purposeful ways	<ul style="list-style-type: none"> <li>Role play based teaching is used to explore realistic situations by interacting with other people in a managed way in order to develop experience and trial different strategies in a supported environment. Depending on the intention of the activity, students are playing a role similar to their own (or their likely one in the future) or play the opposite part of the conversation or interaction. Both options provides the possibility of significant learning, with the former allowing experience to be gained and the latter encouraging the student to develop an understanding of the situation from the 'opposite' point of view of the concept leaned.</li> </ul>
		Brainstorming	To provide diverse perspectives for a topic	<ul style="list-style-type: none"> <li>The subject incharges begin a brainstorming session by posing a question or a problem, or by introducing a topic. Students then express possible answers, relevant solutions and ideas.</li> </ul>

		To create webpages and youtube channel for communications with students	To effectively share resources with students for knowledge enhancement	<ul style="list-style-type: none"> <li>Faculty have created webpages for sharing resources with students like modules, PPTs, Experiment procedure, etc.</li> <li>For each subject, faculty has created a playlist of online video lectures for various topics of the syllabus as per the modules.</li> <li>The video lectures of the faculty are recorded and are kept on the drive as well as in the YouTube channel of an individual faculty for the future references of the students.</li> </ul>
3.	<b>Assessment &amp; Evaluation</b>	Formative assessment Innovative exam for SE. Use of online tool for evaluation	To get better understanding of the students learning through continuous evaluation	<ul style="list-style-type: none"> <li>For each subject the conduction of Formative Assessment (FA) is scheduled at the start of the semester. Academic Calendar contains the dates related to Formative Assessments for each year. Students are given the schedule through Academic calendar and individual faculties also share their respective Formative Assessment schedule with the students.</li> <li>Innovative examination is introduced in FE and SE to develop student's skill towards innovations in concepts learned and applications of the concepts and subjects.</li> <li>Google quizzes, Mentimeter and mind map are used to evaluate students understanding for topic and subjects</li> <li>The evaluation of the practical is done on a weekly basis. The evaluation is done by checking the individual code/program followed by viva. The evaluation is done in 2 cycles for the final marks final marks. For 10 experiments the first 5 are considered in cycle I and the remaining experiments are considered in cycle 2. The average of the cycles is done for the final submission.</li> </ul>
4.	<b>Inclusive classroom</b>	Activity Based Learning (ABL), Project based Learning ( PBL), Research Based Learning ( RBL), Programming Skills (PS), Internship, Employability Skill Development( ESD), Specialization courses	To enhance multidisciplinary learning for overall development of the students	<ul style="list-style-type: none"> <li>In Activity Based Learning (ABL) students are encouraged to participate actively in different activities either individually or in a group with their own learning experience through practical activities. ABL activities are conducted from semester 1 to semester 4.</li> <li>The concept of Project Based Learning (PBL) for implementation of mini projects using the technology learnt under Professional Skills (PS) was introduced as a group learning activity, usually the technology/tools learnt in PS is used to implement in PBL Introduction of the Research Based Learning (RBL) in the curriculum was done to encourage students to take up minor projects in the domain of interest by forming a group. RBL activities are carried out from semester 5 to semester 8.</li> <li>Internship is conducted to strengthen technical knowledge of the students in various domains. Domains are identified as per student's interest and curriculum.</li> <li>Employability Skill Development (ESD) is implemented to develop student's skill keeping industry requirements.</li> </ul>

		Competitive Examination		<p>External Industry experts are conducting training on identified skills.</p> <ul style="list-style-type: none"><li>• If students register for specialization courses, they are learning specialization courses from NPTEL and Coursera. Extra credits will be given to students for completion of the courses.</li><li>• GATE training is conducted for interested students.</li></ul>
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