

## **5.6. Innovations by faculty in Teaching and Learning**

### **A. Statement of clear goals, use of appropriate methods, significance of results, effective presentation (4)**

#### **Goals and Usage of Appropriate Methods:**

1. All the faculty members are required to attend one FDP per Semester.
2. All the faculty members are required to complete one MOOCS certificate per Year.
3. Doctorate faculty need to publish two papers either in indexed Journals or Conferences.
4. Other faculty members have to publish one paper in indexed Journals or Conferences.
5. Non doctorates have to register for Ph.D.
6. Faculty members need to use at least one innovative teaching and Learning Methodology.
7. Students are encouraged to attempt GATE with special coaching to the interested and merit students.
8. Students are encouraged to do NPTEL courses to increase their knowledge base about the subject.
9. Virtual labs to be included for programming subjects.
10. Faculty members have to see that E-content of respective subjects is available to students.
11. Mode of teaching in this institute is not only limited to the traditional Chalk & Talk methods, but also an amalgamation of the modern teaching aids like power point presentation, audiovisual teaching etc.

#### **Teaching and Learning Methodologies**

1. The use of modern teaching aids like LCD projectors, Wi-Fi enabled laptops are usually employed in classrooms and other student learning environments.
2. Department encourages academic discussions between faculty and students using black board and faculty members share academic study material using Moodle, WhatsApp groups and their own blogs.
3. Department has introduced mini projects in the curriculum. Usage of Role play, Model Demo, Charts etc., during teaching learning process.
4. A team of faculty members for analytical subjects and also GATE coaching is provided to the interested and merit students.
5. Expert video subject lectures delivered by the various eminent resource persons are available in the digital library and it facilitates the faculty and students to utilize E-Tutorials of NPTEL, MOOCs & access to E-Journals etc.

6. Faculty members use department library, digital library and other Open-Source platforms to enhance their teaching skills.
7. The faculty members are encouraged to participate in short term courses, Faculty development programs and workshops on advanced topics to keep pace with the advanced level of knowledge and skills. Over the past years the faculties have been participating /presenting papers in national/international conferences and publish their articles in national/international journals to enrich their knowledge.
8. The faculty members are encouraged to use online teaching tools Microsoft Teams, Zoom, Go To Meeting, google classroom and white board Apps for giving online lectures and assignments.

**Table 1: Innovations by Faculty in Teaching & Learning Methodologies**

S. No	Name of the Subjects	Name of the Faculty	Innovations by Faculty in Teaching & Learning Methodologies		Tools Used/Weblink
1	Electronic Devices and Circuits	Dr. A. Vijayalakshmi Mrs. Ch. Sree Lakshmi	Flipped Learning	Blogspot	<a href="http://surl.li/ncnpj">http://surl.li/ncnpj</a>
			Tutorials	Whatsapp	vijayalakshmiatla.blogspot.com
			PPT	You tube	sreelakshmichaparala.blogspot.com
2	Signals and Systems	Dr. D. Hema Dr. S. V. Naresh	PPT	You tube	<a href="https://archive.nptel.ac.in/courses/108/104/108104100/">https://archive.nptel.ac.in/courses/108/104/108104100/</a>
			Seminars	Coursera	
			Tutorials	Blogspot	dubahema.blogspot.com
3	Switching Theory and Logic Design	Dr. T. Krishnamoorthy Mr. B. Balaji Mr. Abdul Azeez	Seminars	Whatsapp	<a href="https://archive.nptel.ac.in/courses/106/105/106105185/">https://archive.nptel.ac.in/courses/106/105/106105185/</a>
			PPT	You tube	
			Tutorials	Blogspot	azeezmails.blogspot.com
4	Pulse and Digital Circuits	Dr. D. Dayakar Rao Mr. K. Chandra Rao	Seminars	Blogspot	<a href="https://www.youtube.com/watch?v=8VYUgEcmrYQ">https://www.youtube.com/watch?v=8VYUgEcmrYQ</a>
			PPT	You tube	
			Charts	Google Class Room	damaladayakarrao.blogspot.com kchandrarao.blogspot.com
5	Analog and Digital	Dr. S. Sivalingam	Virtual Labs	Moodle	<a href="https://www.youtube.com/watch?v=qhjj6WG7Rgc">https://www.youtube.com/watch?v=qhjj6WG7Rgc</a>
			Tutorials		

	Communications	Mr. P. Bharat	Seminars	You Tube	ssivalingam.moodle.com
			PPT	Whatsapp	
6	Electronic Circuit Analysis	Mrs. G. Latha Mrs. T. Pushpalatha	Seminars	Blogspot	<a href="http://surl.li/ncnng">http://surl.li/ncnng</a> lathagavini.blogspot.com
			Tutorials	You tube	
			PPT	Whatsapp	
7	Electromagnetic Theory and Transmission Lines	Dr. R. Dinesh Kumar Mrs. J. Naga Prathima	Seminars	Blogspot	<a href="https://archive.nptel.ac.in/courses/108/106/108106157/">https://archive.nptel.ac.in/courses/108/106/108106157/</a> nagaprathima.blogspot.com
			PPT		
			Tutorials	Whatsapp	
			Project Based Learning	YouTube	
8	Linear & Digital IC Applications	Dr. V. Gajendra Kumar Mr. A. Enoch Mrs. N. Visranthamma	Seminars	Blogspot	<a href="https://shorturl.at/gkzEJ">https://shorturl.at/gkzEJ</a> nandruvisranthamma.blogspot.com alaparthyenoch.blogspot.com
			PPT	Whatsapp	
			Tutorials	You tube	
			Virtual Labs		
9	Antennas and Wave Propagation	Dr. S. Chatterjee Dr. K. Phani Srinivas	Collaborative Learning	Blogspot	<a href="https://www.academia.edu/40805190/Antenna_and_Wave_Propagation">https://www.academia.edu/40805190/Antenna and Wave P ropagation</a> samiranchatterjee.blogspot.com
			Seminars		
			Flipped Learning	Whatsapp	
			PPT	You tube	
10	Digital Signal Processing	Dr. A. Damodar Reddy Mr. K. Naresh	Virtual Labs	You tube	<a href="https://archive.nptel.ac.in/courses/108/101/108101174/">https://archive.nptel.ac.in/courses/108/101/108101174/</a> adamodarreddy.blogspot.com
			PPT		
			Seminars	Whatsapp	
			Tutorials	Blogspot	
11	Microwave Engineering	Dr. K. Murali Babu Mr. Ch. Srihari	Seminars	Blogspot	<a href="https://archive.nptel.ac.in/courses/108/103/108103141/">https://archive.nptel.ac.in/courses/108/103/108103141/</a> chengalvasriha.blogspot.com
			Flipped Learning	Whatsapp	
			PPT	You tube	
12	VLSI Design	Dr. B. Jaya Chandran Mr. B. Rama Rao Mrs. G. Nalini	Collaborative Learning	Whatsapp	<a href="https://nptel.ac.in/courses/117106092">https://nptel.ac.in/courses/117106092</a> bodduramarao.blogspot.com
			Seminars	You tube	
			PPT	Blogspot	

13	Microprocessors and Microcontrollers	Mrs. V. Swarnalatha Mr. V. Narahari	Seminars	Blogspot	<a href="https://www.geeksforgeeks.org/introduction-of-microprocessor/">https://www.geeksforgeeks.org/introduction-of-microprocessor/</a> vayalasettyswarna.blogspot.com vswarnalatha.moodle.com
			PPT	Moodle	
			Flipped Learning	Whatsapp	
				You tube	
14	Optical Communication	Dr. Vasantha Swaminathan S Mr. B. Anjani Kumar Mrs. B. Aruna Kumari	Collaborative Learning	Blogspot	<a href="https://archive.nptel.ac.in/courses/108/106/108106167/">https://archive.nptel.ac.in/courses/108/106/108106167/</a> bodduarunakumari.blogspot.com
			PPT	Whatsapp	
			Seminars	You tube	
15	Digital Image Processing	Dr. V. Ramesh Babu Mr. Ch. Srihari	Virtual Labs	You tube	<a href="https://www.geeksforgeeks.org/digital-image-processing-basics/">https://www.geeksforgeeks.org/digital-image-processing-basics/</a> rameshvallabhaneni.blogspot.com chengalvasriha.moodle.com
			PPT	Blogspot	
			Seminars	Coursera	
			Tutorials	Moodle	
16	Radar Engineering	Mr. G. Venkata Rao Mrs. B. Suneetha	PPT	Blogspot	<a href="https://archive.nptel.ac.in/courses/108/105/108105154/">https://archive.nptel.ac.in/courses/108/105/108105154/</a> gurramvenkatra.blogspot.com buttulasunetha.blogspot.com
			Seminars	You tube	
			Tutorials	Whatsapp	

**Table 2: Innovative tools used by the faculty**

S. No	INNOVATION BY FACULTY	FACULTY NAME
1	Microsoft Teams	All Faculties
2	Google Class Room	Dr. D. Dayakar Rao
3	You tube video	All Faculties
4	Collaborative Method	Mr. B. Anjani Kumar Dr. S. Chatterjee Mr. B. Rama Rao
5	Online Platform: Placement Season	Mr. B. Rama Rao Mr. K. Chandra Rao
6	Flipped Classroom	Dr. A. Vijayalakshmi Mr. Ch. Srihari Dr. K. Phani Srinivas Mr. V. Narahari
7	Virtual Labs	Mr. Ch. Srihari
8	Online Test Tool: Moodle	All Faculties
9	MOOCS (NPTEL, Coursera, Udemy etc)	All Faculties
10	Project Based Learning	Dr. S. Chatterjee

**Table 3: Innovative Teaching aids**

S. No	Item	Description
1	Moodle	<p>Moodle is a learning platform designed to provide educators, administrators and learners with a single robust, secure and integrated system to create personalized learning environments.</p> <p>The features of Moodle are</p> <ul style="list-style-type: none"> <li>• <u>All-in-one learning platform</u></li> </ul> <p>As Moodle provides the most flexible tool-set to support both blended learning and 100% online courses, it can easily integrate everything needed for a course using its complete range of built-in features, including external collaborative tools such as forums, wikis, chats and blogs. Through Moodle, course materials are delivered to students, Quizzes are conducted, assignments are given and grading is done accordingly. It is an effective tool for effective teaching learning process and is being extensively used in our department.</p> <li>• <u>Highly flexible and fully customizable</u></li> <p>Because it is open-source, Moodle can be customized in any way and tailored to individual needs. Its modular set up and interoperable design allows developers to create plugins and integrate external applications to achieve specific functionalities. Hence the Faculty has got the freedom to use Moodle effectively for enhanced teaching learning.</p> <li>• <u>Robust, secure and private</u></li> <p>As data security and user privacy, security controls are constantly being updated and implemented in Moodle development processes against unauthorized access, data loss and misuse, Moodle provides an easy platform for continuous assessment of students. Moodle can be easily deployed on a private secure cloud or server for complete control.</p> <li>• <u>Use anytime, anywhere, on any device</u></li> <p>Moodle is web-based and so can be accessed from anywhere in the world. With a default mobile- compatible interface and cross-browser compatibility, content on the Moodle platform is easily accessible and consistent across different web browsers and devices. This gives a 24x7 learning experience for the users.</p> <li>• <u>Extensive resources available</u></li> <p>Access extensive Moodle documentation and user forums in multiple languages, free content and courses shared by Moodle users across the world, as well as hundreds of plugins contributed by a large global community.</p>

2	Virtual Labs	Engineering Education is incomplete without hands on learning of real systems. IIT Kharagpur having a very strong base in Theory of Engineering Systems has developed a large amount of lecture material which is disseminated through the National Programme on Technology Enhanced Learning (NPTEL) in the form of Video or Web based content for each theory course in Engineering Sciences. NPTEL facilitates the Information and Communications technology (ICT) based distribution to a large audience in the world the lecture materials using the Internet as a medium.
3	MOOCS (NPTEL, Coursera, Udemy etc)	<p>Massive Open Online Courses (MOOCs) are free online courses available for anyone to enroll. MOOCs provide an affordable and flexible way to learn new skills, advance your career and deliver quality educational experiences at scale.</p> <p>Millions of people around the world use MOOCs to learn for a variety of reasons, including: career development, changing careers, college preparations, supplemental learning, lifelong learning, corporate eLearning &amp; training, and more.</p> <p>Faculty members are motivated to students to take up online courses for their subjects from various eminent platforms like NPTEL, Coursera, Edex.</p> <p><b>NPTEL:</b></p> <p>The main objective of the National Program on Technology Enhanced Learning (NPTEL) is to enhance the quality of engineering and science education in the country by developing content for undergraduate and postgraduate curricula using video and web-based courses. These courses cover the syllabi prescribed by universities and approved by AICTE.</p> <p><b>NPTEL Local Chapter:</b></p> <p>Our college is having NPTEL Local Chapter: It is a partnership between the college and NPTEL. Many students and faculty members in the department enroll for courses and get certified after the successful completion of the course.</p> <p><b>Coursera:</b></p> <p>Many faculty members and students in the department have completed online courses based upon their area of interest. These courses also help the faculty to advance their skills for career development.</p> <p><a href="https://www.coursera.org/">https://www.coursera.org/</a></p>
4	Project Based Learning	Project Based Learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging, and complex question, problem, or challenge. Students work on a project over an extended period of time – from a week up to a semester – that engages them in solving a real-world problem or answering a complex question. They demonstrate their knowledge and skills by developing a public product or presentation. As a result, students develop deep content knowledge as well as

		<p>critical thinking, creativity, and communication skills in the context of doing an authentic, meaningful project. Project Based Learning unleashes a contagious, creative energy among students and teachers.</p> <p>The department has made it a mandatory requirement for every student to design and conduct a project, right from the fifth semester onwards which is beyond the regular curriculum for the semester. This helps the student to have a hands-on approach to the engineering design process and utilize the theoretical aspects they have learnt to develop prototypes and design experiments on what they have learnt.</p> <ul style="list-style-type: none"> <li>• During the fifth semester, the students conduct a mini-project that focuses on the fundamental software design aspects of computer Science and Engineering. A project group consisting of a maximum of four members under the guidance of a faculty member explores a scientific principle related to their area of interest. The learning process is given more weightage during the assessment and not the results obtained.</li> <li>• Students in their sixth semester are encouraged to do a project which will help them to learn new technical skills with guidance from an allotted faculty member. They are encouraged to explore a problem and develop a simple prototype or working model that can solve it. This introduces them to the concept of the Engineering design process method.</li> </ul> <p>The group of students is also mentored by their allotted guides in preparing a well-structured report. To assist this process, the institution has published a scientific format in which each project group is required to submit the report. This practice helps the students to understand and improve their scientific writing skills. The prepared report is archived in both soft and hard copy and is made available in the department library for peer reference.</p>
5	Flipped Classroom	<p>A flipped classroom is an instructional strategy and a type of blended learning that reverses the traditional learning environment by delivering instructional content, often online, outside of the classroom. It moves activities, including those that may have traditionally been considered homework, into the classroom</p>
6	Think-Pair-Share	<p>It helps students to think individually about a topic or answer to a question. It teaches students to share ideas with classmates and builds oral communication skills. It helps focus attention and engage students in comprehending the reading material. The Procedure to use this method is</p> <ul style="list-style-type: none"> <li>• Decide upon the text to be read and develop the set of questions or prompts that target key content concepts.</li> <li>• Describe the purpose of the strategy and provide guidelines for discussions.</li> <li>• Model the procedure to ensure that students understand how to use the strategy.</li> <li>• Monitor and support students as they work through the following:</li> </ul> <p><b>T:</b> (Think) Teachers begin by asking a specific question about the text. Students "think" about what they know or have learned about the topic.</p> <p><b>P:</b> (Pair) Each student should be paired with another student or a small group.</p> <p><b>S:</b> (Share) Students share their thinking with their partner. Teachers expand the "share" into a whole-class discussion.</p>



### **Alumni Interaction:**

In ASIST, we have Alumni Association in which every year all the alumni's will have get together. Alumni will interact with their juniors and give them guidance to have betterment in their academics as well as the opportunities in advanced technologies and also path for higher studies.

Some glimpses of the Alumni Interaction



**Figure1:** Mr. Sk. Ashief Basha (13AJ1A0442) interacting with III- year and IV-year students.

**Table 4: Innovative Teaching by Activity Based Teaching**

<b>Activity Based Teaching</b>	<b>Collaborative Learning</b>	It involves encouraging student collaboration for various projects. We live in a globalized world and collaboration is an essential life skill that is important for all careers and enterprises. Teachers can help foster this skill in the classroom by allowing students to learn, study and work in groups.
	<b>Flipped Class Room</b>	It involves encouraging student for presentation of different concepts from the syllabus as a part of revision. Flipping the classroom is an effective teaching method. In this technique, the students are made active participants of the learning process by passing the onus of learning on them, it requires the teachers to relegate to the role of resource providers and the students take the responsibility of gathering concepts information. Using various tools of technology, the students are encouraged to constructing knowledge, fill in the information gaps and make inferences on their own as and when needed
	<b>Group discussions</b>	To make students develop communication skills
	<b>Seminars</b>	To make students develop communication skills and reduce the stage fear in them.
	<b>Blended Learning</b>	It is a style of training in which students learn via electronic and online mode as well as traditional face to face training.
	<b>Social Responsibility</b>	To inculcate the social responsibility by participating students in NSS programmes
	<b>Role Play</b>	The results reveal that participants are more enthusiastic to engage in class activities. They also develop social and communication skills through group activities associated with the teaching of ADA. Role play can be a very useful strategy to teach concepts that are perceived as abstract.
	<b>Learning by Doing</b>	Student can learn the skills and apply in the laboratory in presence of the faculty.
	<b>Mind Map</b>	For better understanding and learning of concepts, new technology provides various tools. Students understands how using digital technology tools could help in boosting task efficiency. By using new tools and technology like hive for extracting important insights from huge data in no time can benefit the user in many ways.

## Collaborative Learning



**Figure 2:** Collaborative Learning.

## Technical Seminars:



**Figure 3:** Technical Seminar Presentation by the Student.

## Project based Learning:



**Figure 4:** Web Development.



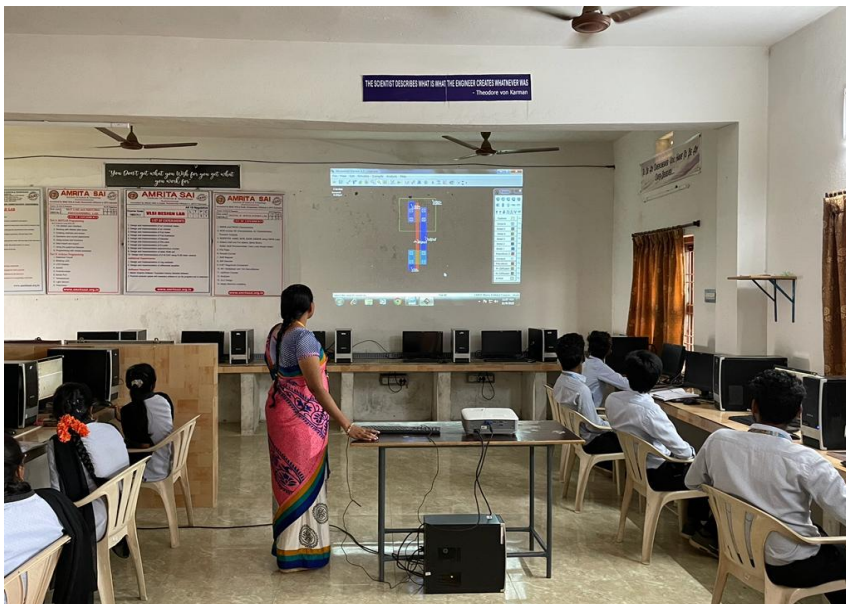
**Figure 5:** Smart Stick and Glasses for Blind Persons using Arduino.



## Faculty Teaching Methodologies:



**Figure 6:** Making use of Xilinx Tool for teaching.



**Figure 7:** Making use of Microwind Tool for teaching.

ASIST is having Digital Library facility. ASIST is registered as a NDLI Club under the National Digital Library of India.

So, students can access the contents available on National Digital Library website anytime.

Department also holding digital library contents of current subjects from NPTEL, Swayam, You tube and other platforms.

**Content Delivery by Video Lectures:** Study materials related to any subject of ECE department Course has made available for students. It helps as a remedial material for the absentees and helps those who have any doubt.

**Whatsapp Groups:** Section wise whatsapp groups have been created for all ECE subjects. Subject specialized faculty members have been added in groups in order to upgrade relevant course materials including recent advances in the area.

**Extension of Ph.D works:** Ph.D. holders of ECE department motivates students and staff for brainstorming future ideas on the existing Ph.D. works.

Type of Innovation in Teaching & Learning Method	The Objective of the Innovation	Significance Results Observed	Template	
Department Digital Library	In order to overcome the gap between the theoretical knowledge and Practical knowledge, The Digital Library is very helpful for Faculty and Students to access the class presentations, previous question papers, course Materials and E-journal.	The students were very much involved and learned students to have self-learning beyond curriculum through the facilities available in the Learning resource centre such as National Programme on Technology Enhanced Learning (NPTEL) Video Lectures and E-journals: IEEE, J-GATE, DELNET, IEI, NDL	S.No	E-Journal Web address
			1	IEEE <a href="https://ieeexplore.ieee.org/Xplore/home.jsp">https://ieeexplore.ieee.org/Xplore/home.jsp</a>
			2	J-GATE <a href="https://jgateplus.com/home/">https://jgateplus.com/home/</a>
			3	DELNET <a href="http://delnet.in/index.html">http://delnet.in/index.html</a>
			4	IEI <a href="https://www.ieindia.org/webui/iei-home.aspx">https://www.ieindia.org/webui/iei-home.aspx</a>
			5	NDL <a href="https://ndl.iitkgp.ac.in/">https://ndl.iitkgp.ac.in/</a>