INNOVATIVE TEACHING

Course Delivery Methods using Pedagogical Initiatives:

Classroom teaching:

The course delivery by the faculty is performed by implementing the following methodologies like

1) Active Learning
2) Collaborative Learning
3) Co-operative Learning/Flipped learning
4) Peer Led Team Learning
5) Experimental Learning
6) Project Based Learning
7) Chalk and talk - green/black board.
8) Animated videos
9) Case studies / Real world examples for application-based courses.
10) Use of Open-Source Software's like MATLAB, P-SPICE etc.

The students enhance their knowledge and skill through

- Guest Lectures
- Industrial visits etc.

1) Active learning:

The faculties adopted an active learning methodology by involving students in the learning process more directly using activities like:

POWER ELECTRONICS

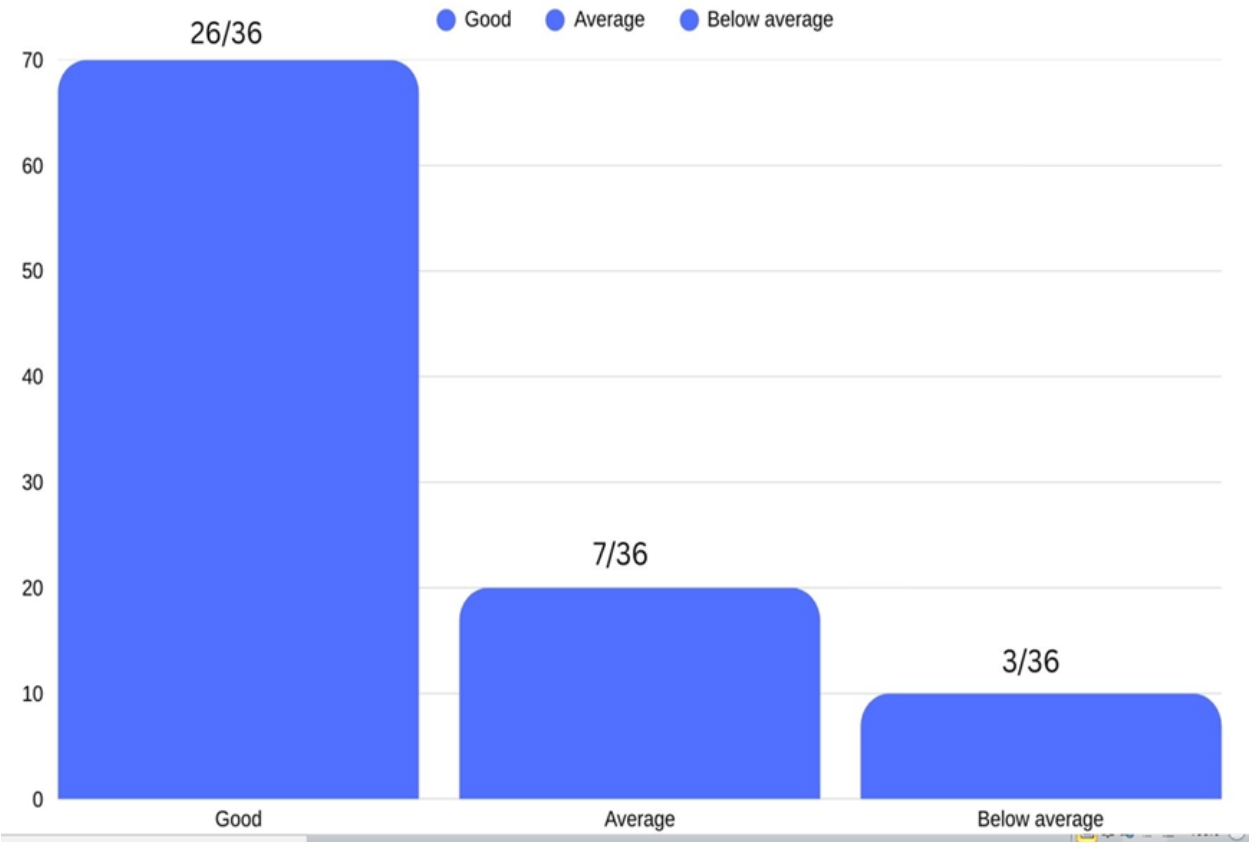
* Indicates required question

Email *

Your email address

1.A diac has _____ pn junctions *

- ◯ Four
- ◯ Two
- ◯ Three
- ◯ None of the above



2. Collaborative Learning:

This is implemented by forming student teams working jointly to solve a problem, complete a working model designed by collaborative learning**2. Collaborative Learning:**

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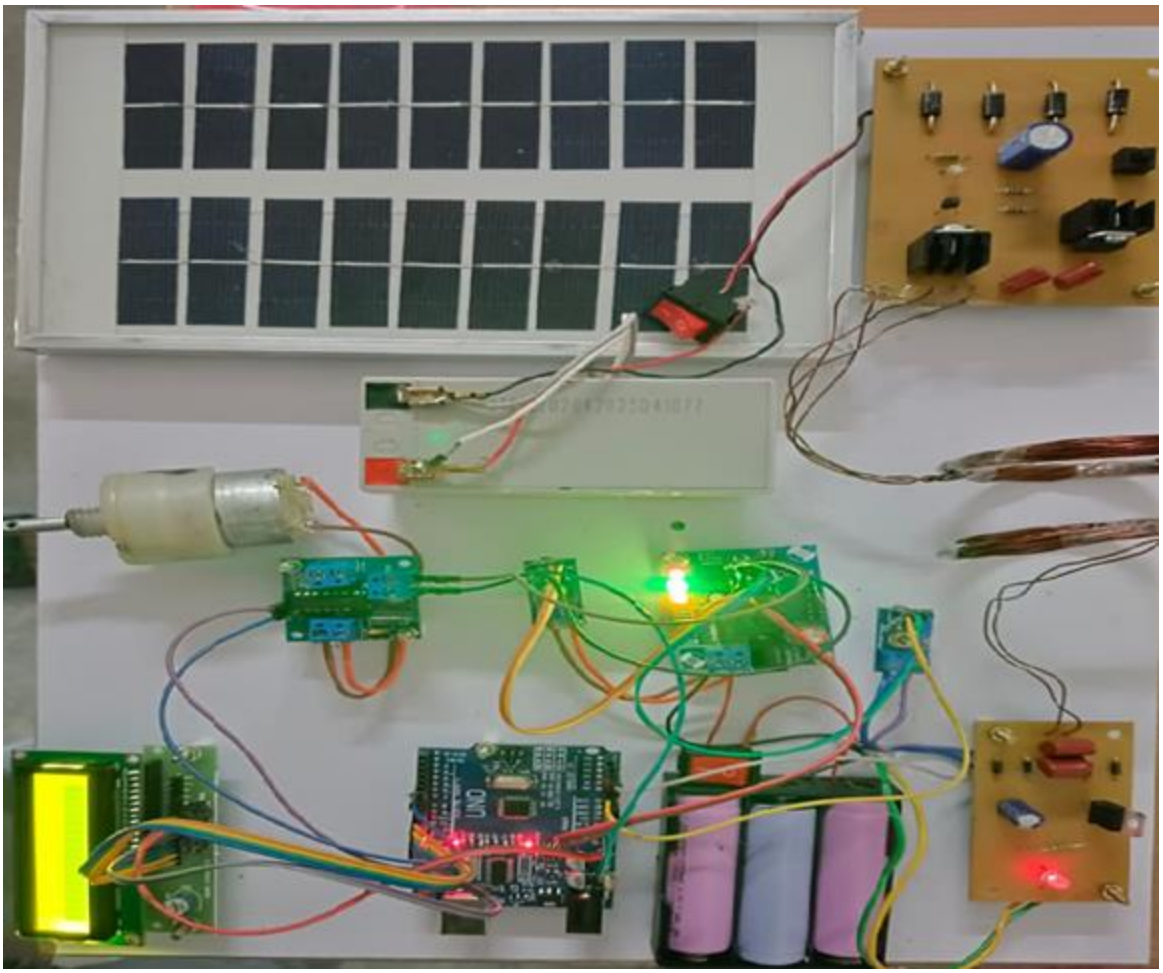
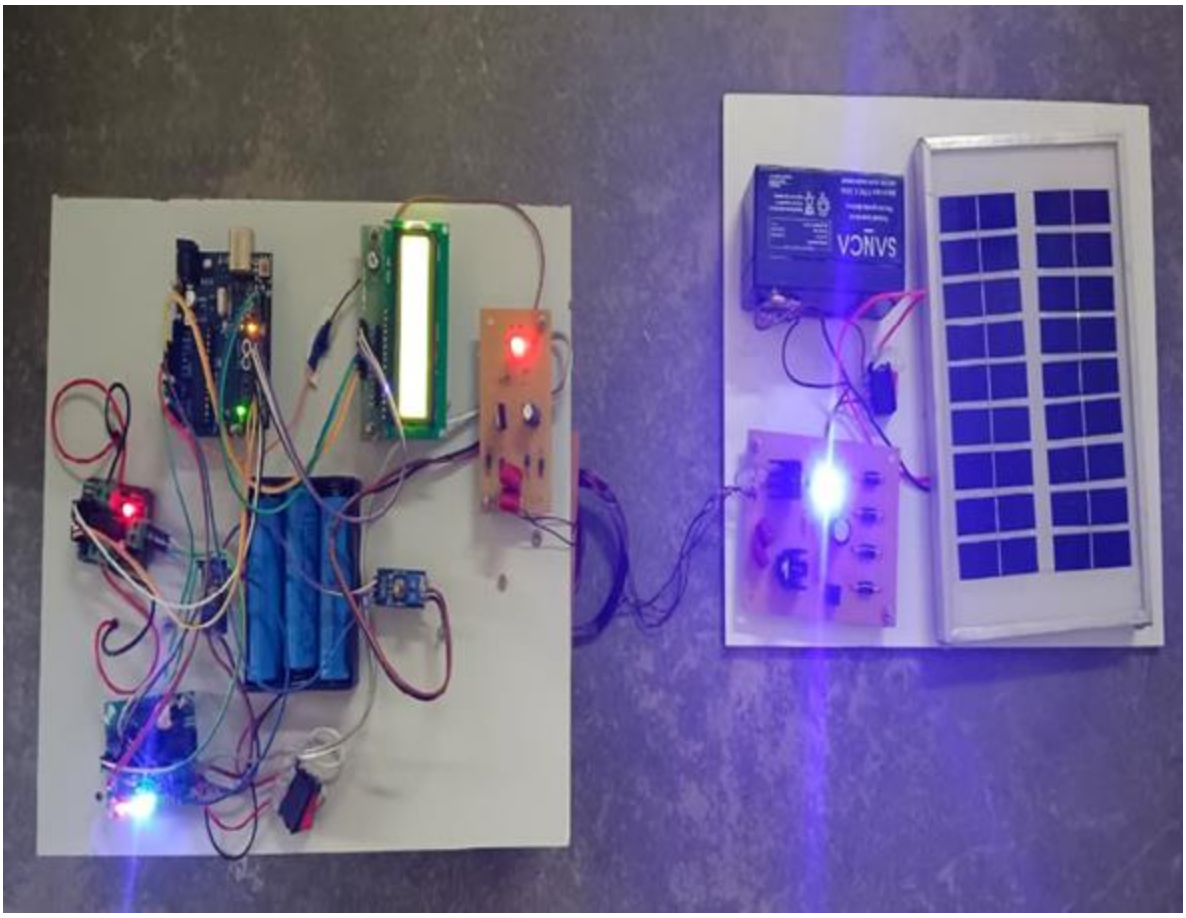
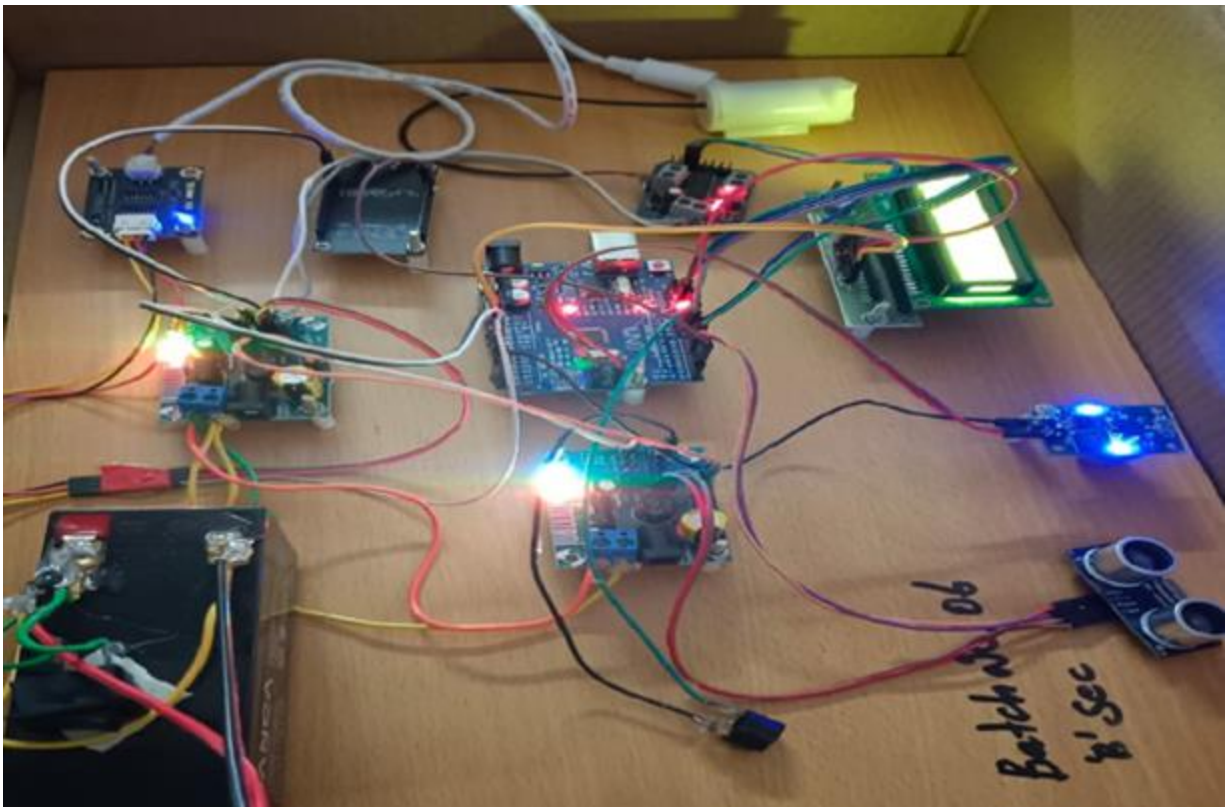


Working model of Renewable Energy System



Working model of EV Charging station



Working model of Smart Automation system

The following table implies the working model implemented by the students during the academic year 2024-2025.

S.NO	COURSE CODE	COURSE NAME	TOPIC	TEAM MEMBERS
1	U20EE604	Protection and Switchgear	Optimized energy Harvesting for Enhanced smart home IOT performance	Gokul Raj R Kathiravan K Prasath S Prithviraj.S
2	U20EE835	Electrical and Hybrid Vehicles	Electric Vehicle to Vehicle Energy Transfer in Emergency using on-board convertor	Abishek .S Karthickraj.K Prasanth.K Rajesh.V
3	U20EE703	Utilization of Electrical Energy	Smart IOT Monitoring of RF Energy Harvesting Techniques for wireless power transfer system	Bhavisna.A Gayathri.A Pavithra.P

4	**U20EE701**	**Renewable Energy Systems**	**Solar Based fuel Bridge Resonant convert for Electric Vehicles**	**Abdul Kalam .M** **Rubin Raj.N** **Sameer.S** **Sanjay.P**
5	**U20EE601**	**Embedded Systems**	**Controller Design for Autonomous direct current for Micro grid Operation**	**Jayanathan .K** **Mahesh .P** **Mohanraj.B** **RajaRajan**

3. Cooperative Learning:

The department also focuses on cooperative learning methodologies. Students work together to maximize their own and each other's learning capabilities within the student chapters and also while performing various activities like think-pair-share, round table techniques, etc.

Students Enrichment program

Digital Design seminar

Hackathon Review

S.NO	TOPIC	ACTIVITY	COURSE CODE/COURSE NAME	TEAM MEMBERS
1	Circuit Debugging Contest	aculty Provide circuits and ask students to troubleshoot.	J23EET32 / Digital Logic Circuits	Aakarsha Sheela.M Aarthi.K Abirami.S
2	Technical Crossword	Each student Using circuit symbols and formulas find the correct answers.	23EET41/Induction and Synchronous Machines	Priyan.K Ramesh.A Saravanan.R Soundhar.B
3	Hardware Hack	Build working circuits ithin a given time (e.g., nverter, charger, LED driver).	J20EE401/Electrical Machines-II	Abhisheik.S Anbarasan.P Anbuselvan.J Balaji.S

4	**Team Quest**	**Groups work through a set of tasks or questions, earning points for correct answers.**	**U20EE504/Internet of things based System Design**	**Kaviya.T** **Hemavarshini.S** **Mahalakshmi.S** **Aasha.G**

4. Peer Led Team Learning:

Institute provides an environment for students to engage in intellectual discussions and work in team for problem-solving under the guidance of a peer leader to perform various activities.

Technical Talk

Explain and Explore

Concept Coaches

Peer-Led Case Study Crunch

S.NO	TOPIC	ACTIVITY	COURSE CODE/COURSE NAME	TEAM MEMBERS
1	Concept Coaches	Circuit Cipher and Name the Circuit	U23EET32 / Digital Logic Circuits	Parvendhan.S Pasupathi.R Praveen.N
3	Explain and Explore	Students explain ideas to teammates, helping deepen understanding and clarify confusion.	U23EET31/Measurement and Instrumentation Systems	Saravanan.S Silambarasan.S Siva.S

4	**Peer-Led Case Study Crunch**	**Teams analyse real-world cases collaboratively under the guidance of a peer leader.**	**U20EE504/Internet of things based System Design**	**Ramesh.A** **Ramkumar.R** **Siva.P**
5	**Students Enrichment Program**	**Technical Talk**	**U23EET42/Transmission and Distribution**	**Arunkumar.RK**

5. Experimental learning:

Field based experiential learning like Internship, Workshops, Service learning and class based experiential learning like role plays, games, case studies, simulation, virtual lab, presentations are practiced for students. We also implement Experimental learning through laboratory sessions. Per lab session Two experiments are conducted for students. Our Institute have tie up with NIT, Surathkal through which Virtual lab experiments are implemented which provides interactive simulation environments and also prepare students for remote experimentation by simulating equipment operation.

PI, PD or PID Controller for a Control System

S.NO	COURSE CODE	COURSE NAME	EXPERIMENTS CONDUCTED THROUGH VIRTUAL LAB	LINK
1	U23EEP32	Electrical Measurements	Calibration and Testing of Single Phase Energy Meter.	https://elms-iitr.vlabs.ac.in/exp/energy-meter/simulation.html

2	U20EE506	Control Engineering lab	Study the effect of PI, PD and PID controller on system performance	https://ce-dei.vlabs.ac.in/exp/to-study-the-effect-of-pi-pd-and-pid-controller-on-a-control-system/simulation.html
3	U20EE605	Power Electronics – 1 lab	Characteristics of controlled switching power devices	https://pe1-iitd.vlabs.ac.in/exp/controlled-switching/simulation.html
4	U23EEP32	Electrical Machines lab	Speed control of DC motor by armature resistance control	https://ems-iitr.vlabs.ac.in/exp/dcshunt-motor-armature-control/simulation.html

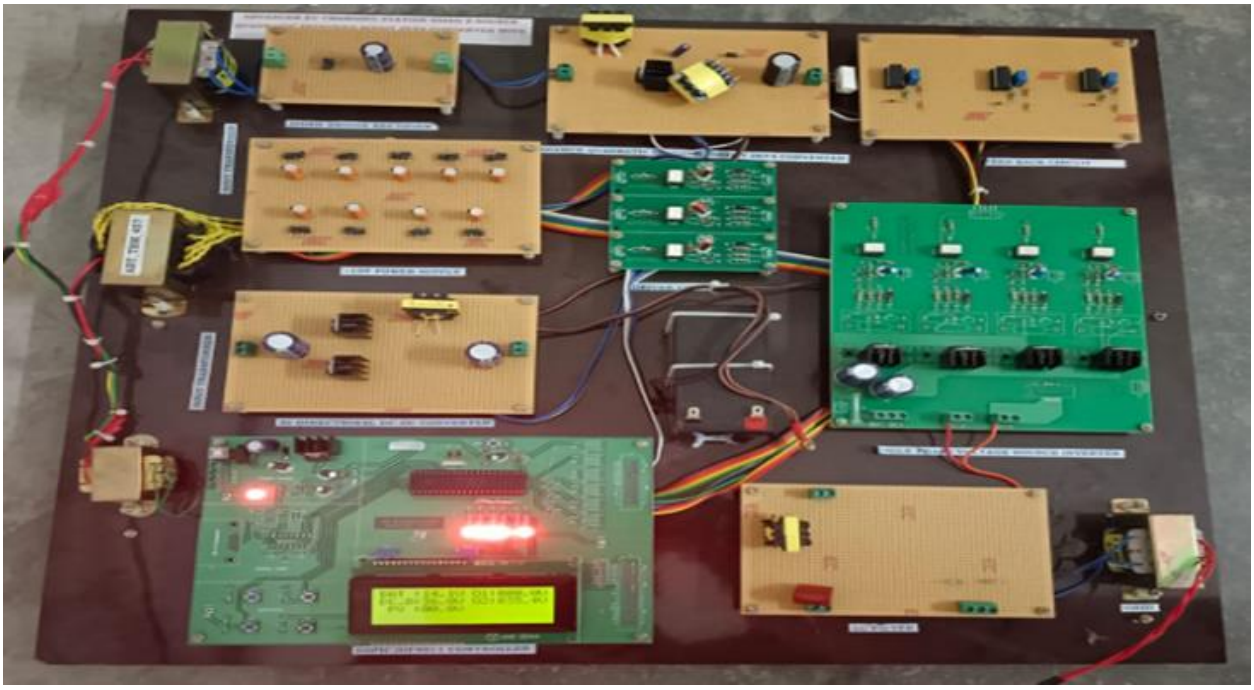
6. Project based learning:

One of the notable recent pedagogical advancements undertaken by the department is the adoption of **Project-Based Learning (PBL)**. This instructional methodology employs a dynamic, student-centered classroom approach, enabling students to gain a deeper understanding of theoretical concepts while simultaneously enhancing their practical competencies.

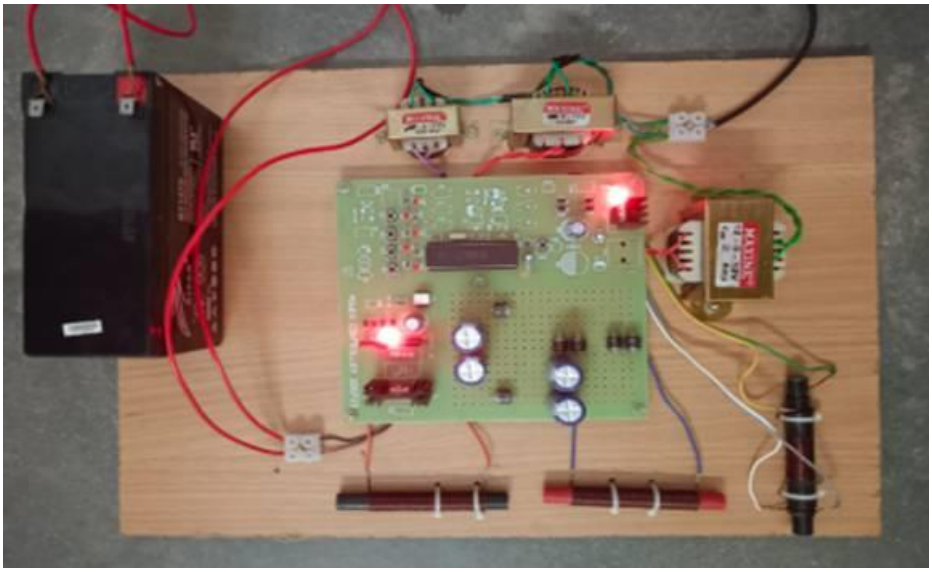
By engaging the students in projects that address real-world challenges, students are encouraged to extend and apply their engineering knowledge toward developing innovative solutions. Students

are encouraged to carry out mini projects to apply their engineering knowledge from fifth semester onwards till seventh semester. Each student must take up mini project based on the core subject they learn in the current semester with help of faculty mentor. At the end of each semester projects are evaluated by the External Experts.

Sample project executed by the student during the academic year 2024–25 is given below:



Hybrid PV Fuel Cell EV- Charging



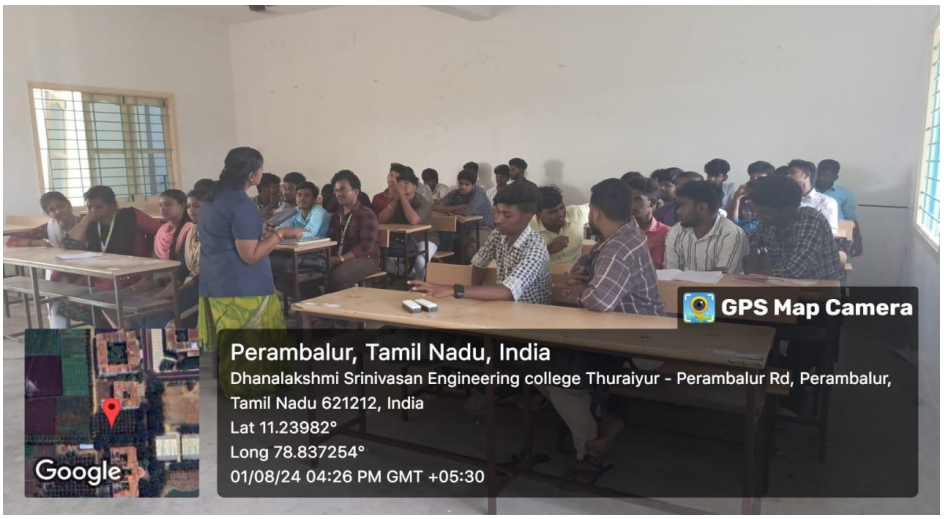
EV Power Hub with Z-Source Quadratic ZETA Converter

· Brainstorming, quiz, debate, group discussions, role play, games, model making, mini project, presentations, essay, elocutions, case studies and simulations on technical content. Replacing some lectures with animated PPTs.

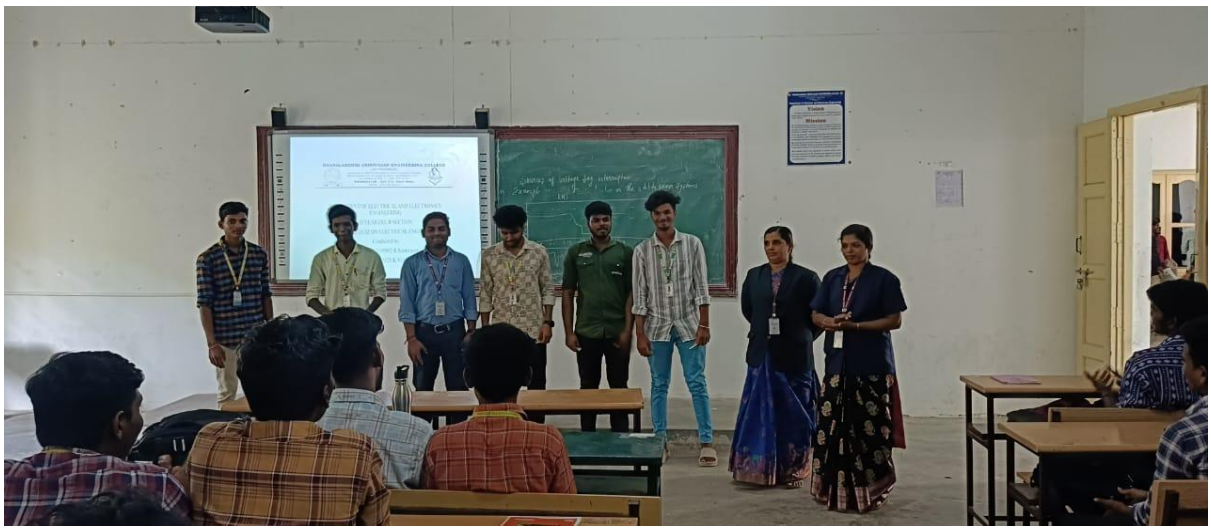
· Hands-on experiences.

· Challenging students to take up open ended problems requiring critical/creative thinking. Short pauses for reflection during lectures, brief demonstration.

On 2nd August 2024, 11.00am to 1.00 pm our III EEE and IV EEE B section students were actively attended MIC Driven session in the title of "**Building the Pipeline of Quality Innovations and Startups in HEIs with Ecosystem Enablers by Creating and Managing YUKTI Innovation and IPR Repository (YIIR)**" at PSS Laboratory. Totally 65 students were actively attended the session and answers the questions asked by expert.



On 01.08.2024 our EEE Department organized Student Enrichment Program (Technical Quiz) for final year EEE A section students. More than 45 were actively participated. The event was coordinated by Mrs.M.Bhuvaneshwari Assistant Professor, EEE.



On 12.8.24 EEE departemnt organized Technical Quiz for Third year EEE B section students in the Smart class room. Totally 25 questions were discussed. Totally 51 students were actively participated. At the end of the session three high score students were selected and awarded with prizes.