

5.6. Innovations by the Faculty in Teaching and Learning

Statement of Clear Goals:

The goal is to enhance student engagement, understanding, and retention in core Electronic and Communication Engineering (ECE) courses, by implementing innovative teaching and learning strategies. These strategies aim to cater to diverse student performance levels and improve learning outcomes by integrating modern technological tools, active learning techniques, and project-based learning.

Use of Appropriate Methods:

To achieve these goals, the following innovative teaching methodologies are employed:

1. Active Learning Techniques:

- Multimedia Learning Process / ICT tools
- Conducting Group discussions/Debate
- Using charts, models and case study
- Flipped classroom
- Web-based learning
- Soft skill classes for personality development
- Using MOOCS/NPTEL learning material.
- Blogs and YouTube channel

2. Technology Integration:

- **Simulation Tools:** Use of Ansys, Cadence, MATLAB, Multisim, and COMSOL Multiphysics to provide hands-on experience in sensor design and simulation.

3. Project-Based Learning (PBL):

Students are always encouraged to work on mini-projects such as designing and simulating basic electronic circuits to solve real-world problems. This promotes critical thinking, creativity, and application-oriented learning.

4. Outcome-Based Education (OBE) Approach:

Course outcomes (COs) are mapped to program outcomes (POs), and assessments are designed accordingly to ensure alignment with desired learning outcomes

Significance of Results:

The implementation of these innovations has resulted in measurable improvements, including:

- Increased student engagement and participation due to interactive and application-based sessions which in turn increases **regularity as well as pass percentage**.
- Helped in improvement of **attainment of COs, POs and PSOs**.
- Average **Pay Package** has been **increased**.
- Helped the students to secure **Influential Student Awards** from State Government and Industry.
- Enhanced student performance in academic aspects.

- Improved understanding of simulation and modeling tools, leading to better project outcomes.
- Enhanced problem-solving and analytical skills, as reflected in improved scores and positive student feedback.

Effective Presentation

The results and teaching innovations are effectively documented and presented through various formats, including

1. **Academic Reports and NBA Files:** Detailed documentation on course modules, innovations, and impact metrics is included in the NBA supporting file for the academic years 2021-22, 2022-23, 2023-24, and 2024-25*.
2. **Workshops and Seminars:** Presentations on innovative practices are shared with faculty peers through departmental workshops, faculty colloquiums, and faculty development programs (FDPs).
3. **Student Project Demonstrations:** Students present their mini-projects and simulation models during project expos and evaluation sessions, encouraging peer-to-peer learning.

Reflective Presentation

Reflective practices are employed to assess and improve teaching innovations through

1. **Feedback Mechanisms:** Regular collection of feedback from students and peers on the effectiveness of teaching strategies and course content.
2. **Self-Reflection:** Faculty members shared their experiences, challenges faced, and improvements made in subsequent semesters.
3. **Assessment Analysis:** Evaluating student performance data to identify trends and make necessary modifications to teaching approaches, ensuring continuous improvement in learning outcomes.

Head of the Department