

Innovations in Teaching and Learning

The key role of a teacher is to teach the concepts, which can be understood as meaning to facilitate learning of some target curriculum. Teaching is therefore intimately tied to notions of learning and there is a sense that if students do not learn then whatever the teacher is doing does not deserve the label of 'teaching'. The use of innovative methods in educational institutions has the potential not only to improve education, but also to empower people, strengthen governance and galvanize the effort to achieve the human development goals for the country.

The Teaching and learning activity and information shared to students may typically include statement of clear goals, adequate preparation, use of appropriate methods, and significance of results, effective presentation and reflective critique.

Engineering students of different branches learn many theory subjects and perform labs as per curriculum.

Traditional Teaching Method: In the pre-technology education context the teacher is the sender, the educational material is the information and the student is the receiver of the information. Traditional teaching method has been used for decades as an educational strategy in all institutions of learning. Basically teacher controls the instructional process, the content is delivered to the entire class and the teacher tends to emphasize factual knowledge.

Following innovative learning methods are initiated and implemented by the faculty for students to learn in a better manner.

❖ Instruction delivery methods:

1. Establish a positive classroom environment
2. Begin lessons by giving clear instructions
3. Maintain student attention
4. Use appropriate pacing
5. Provide suitable seatwork
6. Evaluate what has taken place in your lesson
7. Make a smooth transition into next subject
8. Develop positive teacher/student relationships

❖ **Instructional methods**

1. **Lecturing:** where professors address the most people at once, in the most general manner, while still conveying the information that he or she feels is most important, according to the lesson plan.
2. **Demonstrating** Is the process of teaching through examples or experiments.
3. **Collaborating** Collaboration allows students to actively participate in the learning process by talking with each other and listening to others opinions.
4. **Classroom discussion** It is also a democratic way of handling a class, where each student is given equal opportunity to interact and put forth their views. A discussion taking place in a classroom can be either facilitated by a teacher or by a student.
5. **Classroom Action Research** Classroom Action Research is a method of finding out what works best in your own classroom so that you can improve student learning.

❖ **Assessment Methods**

1. Group Work
2. Multiple Choice Questions
3. Observation
4. Open book
5. Orals
6. Participative online discussion
7. Peer assessment
8. Performance

❖ **Evaluation methods**

1. Observation of student's performance in group activity.
2. Submission of assignments.
3. Students presentation.
4. Project submission.

Teaching Learning activities conducted.

Subject Name	Topic Name	Activity
Digital Communications	Review of Analog Communications	Stump your partner
Signals and Systems	Fourier Transform	Problem solving
Mechatronics	Mechanical Actuators	Jigsaw
Linear Integrated Circuits and Applications	ADC and DAC specifications	Jigsaw
Digital Communications	Pulse Modulation Techniques	Open book exam
Digital communications	Introduction to Digital communication Systems	Objective Test
Probability Theory and statistical processes	Distribution and Density Functions	Group Problem solving
Probability theory and statistical processes	Recalling of Differentiation and Integration formulae	Stump your partner
Signals and systems	Fourier Series	Teams-Games-Tournaments
Mechatronics	Key Elements of Mechatronics	Think-Pair-Share

1. Topic Name: Recalling of Differentiation & Integration Formulas

Name of the Activity: **Stump Your Partner**

Description of the Activity: This activity is for entire class

- i) Students create a difficult question based on the lecture content.
- ii) Pose the question to the person sitting next to him.
- iii) She/he writes response and pose question to next person and this will continues for entire class.

Outcome: This activity will help students to recall basic Differentiation & Integration formulas.

Rubric for Stump your partner:

The rubric for 10 Marks is assigned based on the following criteria:

Creativity	-	5Marks
Response	-	5Marks
Total	-	10Marks

2. **Topic Name:** Key Elements of Mechatronics- Identify the Mechatronics system that you use in day to day life or the system you have used.

Name of the Activity: Think--Pair--Share

Description of the Activity:

- i) Instructor poses question to class
- ii) Students write the answer(5-6 minutes)
- iii) Students pair up with another student nearby
- iv) Each student explains his/her response to the other
- v) If they disagree, each clarifies his/her position and determines how/why they disagree. Why use it?
- vi) Keep students engaged in large classes

Activity Outcome: The students were interestingly started to brainstorm the topic and listed number of answers related to the topic and presented on the dais

Rubric for Think--Pair--Share:

The rubric for 10 Marks is assigned based on the following criteria:

Answer	-	5Marks
Explaining the answer/Justification	-	5Marks
Total	-	10Marks

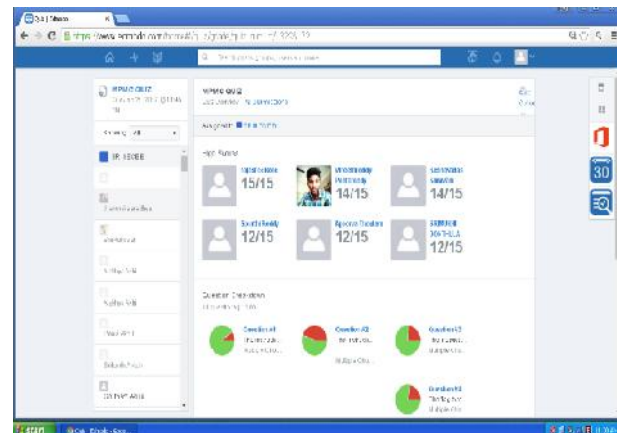
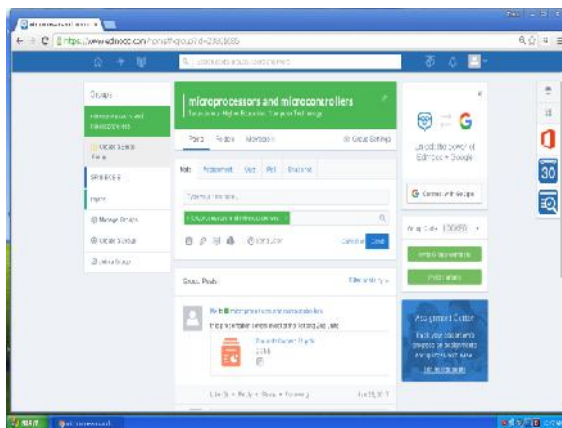


Other Innovation Teaching methods

- **Group Assignments**

Description of the method– The students were asked to submit a group assignment in the form of course project in a form to investigate any practical electromagnetic structure on several parameters and present the review. They were also asked to simulate the product on the EM software available in the laboratory. The objective is to develop technical and soft management skills in the student.

Significant results observed– The students develop soft management skills like teamwork, coordination, decision making, organizational behaviour, leadership, time management and presentation skills along with the enhancement in technical skills through in-depth investigation, product design, prototype, working in RF environment and calibration of test instruments.



Teaching through LMS (Learning management System)-EDMODO:

Teaching through video sessions:

S.No.	Subject Name	Topic	Video Link
1	Digital communications	Spread Spectrum Techniques	https://www.youtube.com/watch?v=ktJipbkwRRM
2	Digital Signal Processing	Multi Rate Signal Processing	https://www.youtube.com/watch?v=j5FdJfWIPqA

Learning through MOOC Resources:

<https://www.coursera.org/>

<http://www.saylor.org/>

<https://www.edx.org/>

<https://www.kadenze.com/>

<http://www.openuped.eu/15-news/62-106-new-free-courses-by-uninettuno>

<https://www.udacity.com/>

<http://www.instreamia.com/class/>

<http://worldmentoringacademy.com/www/index.php>