

St. Joseph's College of Engineering,

Dept. of ECE

Innovations in Teaching and Learning Process

1. Google Classroom

The primary purpose of Google Classroom is to streamline the process of sharing files between course instructors and students, Google Classroom combines Google Drive for assignment creation and distribution, Google Docs, Sheets and Slides for writing, Gmail for communication, and Google Calendar for scheduling. Students can be invited to join a class through a private code. Each class creates a separate folder in the respective user's Drive, where the student can submit work to be graded by a teacher. Mobile apps, available for iOS and Android devices, let students take photos and attach to assignments, share files from other apps, and access information offline. Course instructors can monitor the progress for each student, and after being graded, course instructors can return work, along with comments.

2. OAGS (Online Assessment and Grading System)

Automatically-graded exercises using *Flubaroo* (FREE add-on to Google Forms/Sheets) which lets the course instructor to quickly grade and analyze student performance on multiple choice for self-assessment and to help in digesting and understanding the basics of the topic. A typical unit in the course concludes with a set of more extensive problems to help in integrating the topics and developing a deeper understanding. Automatic grading of answers to these problems as well as solutions will be provided. Through OAGS, the course instructor and students are able to get the followings

- Get scores for each student, and identify students in need of extra help
- View average score, and a histogram of scores.
- Quickly identify questions which a majority of the students missed.
- Share scores with students via email or Google Drive, along with optional notes to the class and/or to each student.
- Assign own score to open-ended questions.
- Send stickers and badges when instructor shares grades.

3. Interactive JAVA Applets for Self-learning

The course instructors utilize a customized software applet like Java based applets for making the students to understand the complex concepts which involves visualizing a virtual concept. Learners can tune several parameters provided in the applet to gain broader insight on the subjects which require additional efforts from teaching and learning communities. JAVA applets are employed for the following courses

- Electromagnetic Field Theory
- Transmission Lines and Waveguides
- Antenna and Wave Propagation

4. Model Based Teaching Learning Process (MBTLP)

Real time prototypes are designed by a team of faculty members (Special Interest Groups) for each course that is being offered in the current semester. These prototypes aids in quick absorption and assimilation of the concepts.

- MATLAB simulation models which closely emulate a real-time world are developed for courses like Signals and System, Principles of Digital Signal Processing, Communication Theory, Digital Communication and Wireless Communication. These models help the students
 - To visualize techniques that improve accuracy and reliability of Digital Communications
 - To visualize Analog and Digital modulation schemes
 - To visualize Transmission and reception of signals
- In Antennas and Wave Propagation course, Microstrip Patch Antennas are simulated and the prototypes are fabricated to instill the idea in the young minds that they will be able to design a real-time product and to correlate with the theories discussed in the regular classroom.
- PSPICE Model of the circuit configurations discussed in courses like Electronic Circuits I & II and Linear Integrated Circuits are shown to students to encourage them to pursue activity-based learning. This helps the students
 - To verify circuit designs
 - To speculate circuit behaviour