

K.L.N. COLLEGE OF ENGINEERING

(An Autonomous Institution and affiliated to Anna University Chennai)

DEPARTMENT OF MECHANICAL ENGINEERING

Instructional Methods and Pedagogical Initiatives:

A well-defined process for subject allocation is adopted at the department level. Faculty members choose one subject from each semester as their preference. Subject allocation is made based on the choice or expertise of faculty members before the commencement of the semester. Once the subjects are allocated, faculty members prepare a detailed lecture schedule, assignment questions, etc. for the particular course. Course materials are prepared as per the lecture schedule and course outcomes.

Faculty members use various pedagogical methods for the effective teaching-learning process. The department has taken the following pedagogical initiatives:

1. **Chalk & Board:** The conventional and most effective instructional method is the chalk & board and the faculty exhaustively resort to this traditional method.
2. **Project-based learning (PBL):** It is more effective to evolve competent and skilled practitioners. Project-based learning is an innovative practice used to implement outcome-based education at our institute. Students are encouraged to carry out multidisciplinary projects to gain engineering knowledge.

The PBL activity is described below:

- a. The Project coordinator will inform the students to form their group (3-5 students in one group) and choose the guide
- b. The topic is identified by the group in discussion with the guide and it is submitted to the Project coordinator.
- c. Review of the progress of the students towards the completion of the project is done in every month. At the end of the semester, a presentation with the demonstration is conducted and at the end of the year, a project exhibition is organized and is evaluated by a team of experts.
- d. Students are motivated to participate in various national level project competitions.

3. Collaborative learning:

In terms of Collaborative learning the following activities are planned:

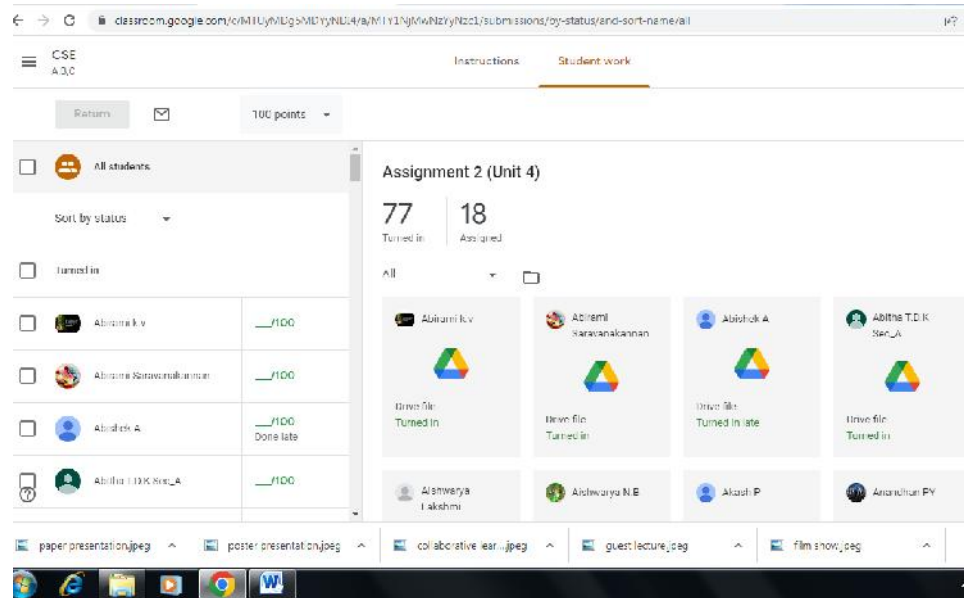
- **Industrial visits-** Field visits to various industries are organized regularly to support curriculum delivery.



- **Guest Lecture** by Industrial experts are arranged based on the gap analysis from industry / academia.



- **ICT based Learning-** Faculty members have floated their You tube Channels, have prepared and upload E-contents (presentations, videos, study materials, assignment, etc.) in You tube Channel, Google classrooms. Online lectures are conducted through Google meet, zoom, MS teams. ICT supported learning like NPTEL, included in the regular academic schedule.



- Students are encouraged to undergo internship and industrial projects.

4. Supportive learning:

In terms of Supportive learning, the following activities are planned:

- **Peer learning** – Students are asked to deliver a presentation on topics, case studies, recent trends in mechanical engineering.



- **Brainstorming**-Brainstorming helps students to produce new ideas or solve problems by doing a group discussion



- Creating awareness about Higher education in India & Foreign Universities.
 - Incubation, Startups and EDC – Mentored by Experts from IIT,NIT and reputed industries.
 - Soft skills and domain training by the competent experts.
 - Motivating students to participate in national and international competitions.
 - Mentoring by the senior faculties and industrial experts.
5. **Interactive learning:** The faculty use black board and audio visual aids in teaching. Students are encouraged to actively interact during the lecture hours for getting the doubts clarified. Models and charts are used for interactive learning.



6. Computer-assisted learning:

SMART class Room: Faculty are using LCD Projector class rooms / Audio Visual Halls for interactive sessions, webinars, animations, NPTEL and other online videos.



7. **Case studies:** Case study approaches are used that provide students an application of engineering knowledge.
8. **Laboratory experiments beyond syllabus-** Some laboratory experiments are allocated to students to enhance their practical knowledge.

INNOVATION IN TEACHING LEARNING PROCESS

Innovation in Teaching

1. Think, Pair, Share
2. Identify the Parts
3. Transfer the concept
4. Entry ticket and Exit ticket
5. Role Play
6. Four Corners
7. One minute Paper
8. Stop and Go
9. Jig Saw
10. Quiz
11. Pre-Reading materials

THINK-PAIR-SHARE (TPS)

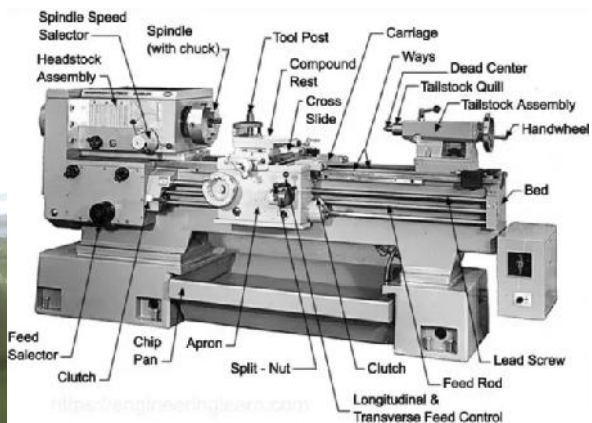
Think-Pair-Share (TPS) is a cooperative learning activity that can work in varied size classrooms and in any subject. Faculty members pose a question, students first THINK to themselves prior to being instructed to discuss their response with a person sitting near them (PAIR). Finally, the groups SHARE out what they discussed with their partner to the entire class and discussion continues. TPS can be a 5-minute activity or something that takes 30 minutes or more.



OUTCOME OF THINK-PAIR-SHARE (TPS)

Students get time to think critically, creating a learning environment that encourages high quality responses.

IDENTIFY THE PARTS



OUTCOME OF “IDENTIFY THE PARTS”

To understand the parts of the given machine

TRANSFER THE CONCEPT

It helps the students to grasp a new concept by having them apply it to a different area. For example, the students are taught about the new concept. After determining students have a strong command of the concept, show them visuals about the application of the concept. Individually, have them write down how the concept is applied.



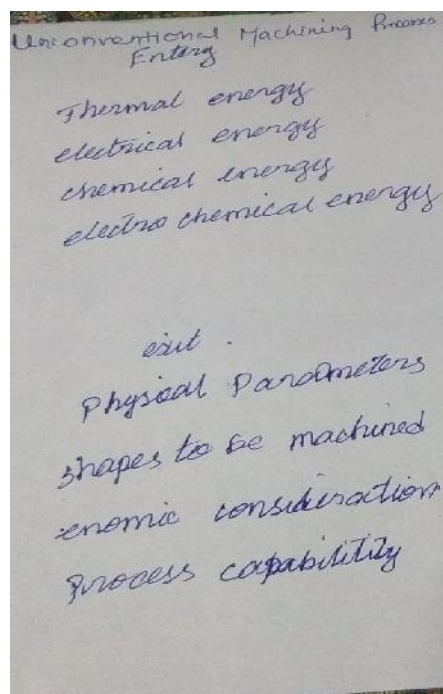
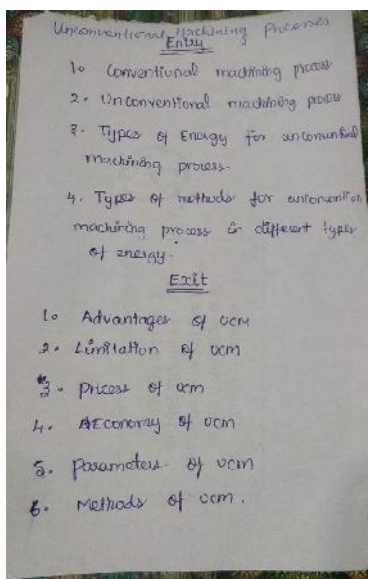
OUTCOME OF “TRANSFER THE CONCEPT”

Students can apply the concept taught to them.

ENTRY TICKET AND EXIT TICKET

This method is used to gather information about how well students processed the most recent lesson by giving them five minutes to write an entry or exit ticket.

As a formative assessment, entry tickets should ask students to reflect on a specific class or exercise from the previous day. Exit tickets should involve students summarizing what they've just learned.



OUTCOME OF ENTRY TICKET AND EXIT TICKET

Either way, it is possible to easily see how well students processed and retained key content, indicating knowledge gaps.

ROLE PLAY

Role play exercises give students the opportunity to assume the role of a person or act out a given situation. These roles can be performed by individual students, in pairs, or in groups which can play out a more complex scenario.

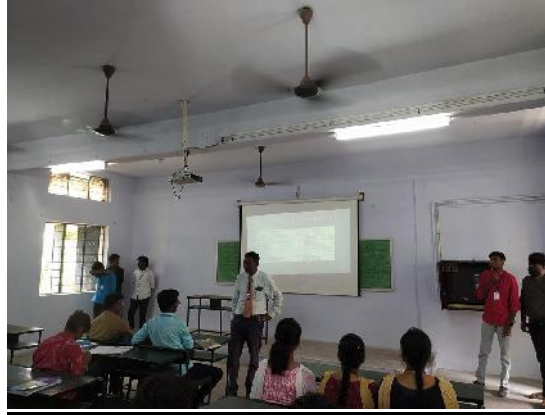


OUTCOME OF ROLE PLAY

Students can actively participate in group activity and understand the concepts easily.

FOUR CORNERS

In this method, students are gathered in the middle of the room, reading each question and its possible answers aloud. Students are then allowed to move to the corner that represents what they believe is the correct answer.



OUTCOME OF FOUR CORNERS

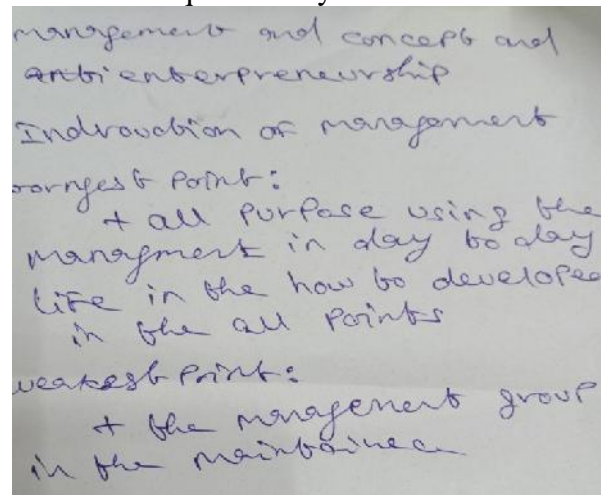
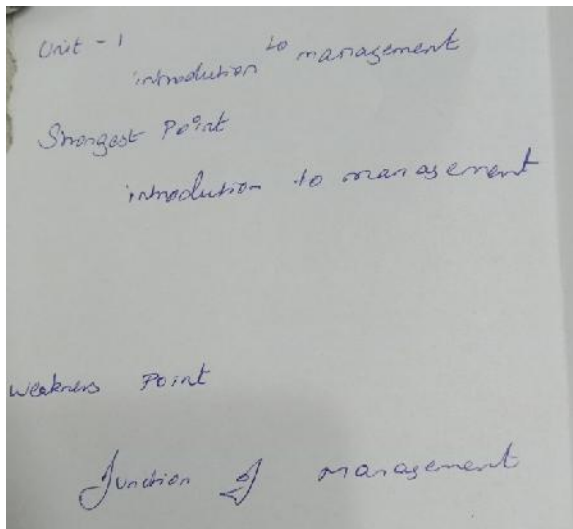
Depending on how students move, an understanding of class can be assessed.

ONE MINUTE PAPER

It is a solo writing task, you don't have to take one-minute papers literally. Students can have a bit more time as they work to answer a brief question about the lesson.

It should be an open question, which allows you to easily assess understanding.

For example, students can be asked about (a) the lesson's confusing areas, (b) any unaddressed queries they have.



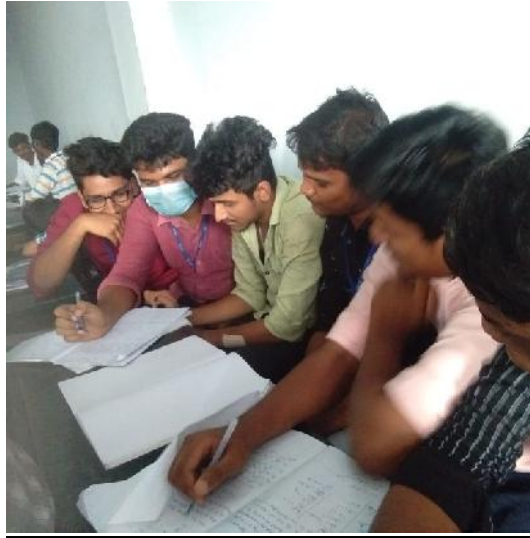
OUTCOME OF "ONE MINUTE PAPER"

Faculty comes to know the students feedback about their lecture.

JIG SAW

This method is applied to teach accountability to each student while checking for understanding of a specific topic.

A mainstay part of cooperative learning, the method consists of dividing a task into subtasks and assigning one to each student in a small group. Group members then work to become “experts” about the information within their subtasks.



OUTCOME OF “JIG SAW”

Each student returns to their group after this investigation process, sharing new knowledge.

QUIZ

Quiz is conducted not only to test the person knowledge but also to test the speed of a person's brain and how active a person can think in a given particular situation.



OUTCOME OF “QUIZ”

Students and faculties learnt more new trending concepts in Engineering.

STOP AND GO

This method allows the students to give real-time feedback with “stop and go” cards. As the lecture is delivered, students should hold the green side if they understand everything. If something's unclear, they are encouraged to turn the red side forward. On seeing red, stop and clarify — or expand upon — the concept until green card is shown.

OUTCOME OF “STOP AND GO”

This should help the faculty to quickly assess if students are processing content as it is delivered.