EXCEL ENGINEERING COLLEGE

(Autonomous)

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

Accredited by NBA (AERO, MECH, CSE, ECE) NAAC with "A+" and Recognised by UGC (2f &12B)

KOMARAPALAYAM - 637303

DEPARTMENT OF AGRICULTURAL ENGINEERING

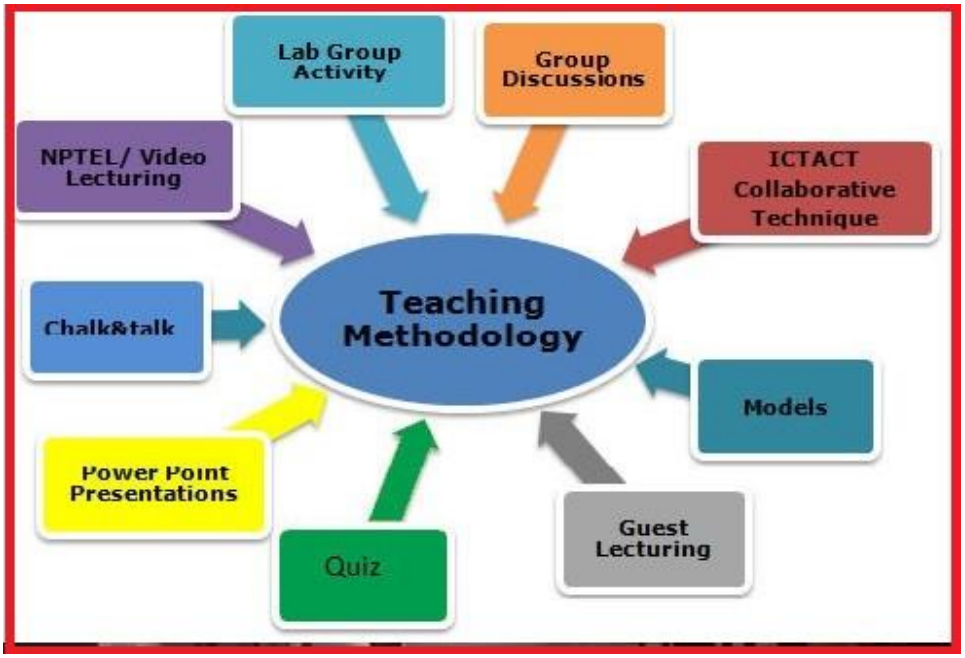
Teaching–Learning Processes

Use of Various Instructional Methods and Pedagogical Initiatives

Faculty members are adopting various innovative teaching and learning methodologies to create an enriched learning environment for students. The integration of both traditional and technology-enabled methods reflects a balanced approach that caters to diverse learning styles.

Here is some common teaching and learning methodologies that faculty adopts:

- Expert and guest lecturers Tutorials / E-learning classes.
- Assignments for individual and groups. Laboratory practices for individual and groups. Group Discussions and brainstorming.
- Conduct of technical quiz.
- Video lecture (animations) where every concept is explained with real world industrial illustrations, problematic aspects, design issues and short cut methods.



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INNOVATIVE PRACTICES IN TEACHING & LEARNING

1. Flipped classroom

Flipped learning is a pedagogical approach in which the conventional notion of classroom-based learning is inverted, so that students are introduced to the learning material before class. The class room time being used to deep understanding through discussion with peers and problem-solving activities facilitated by teachers.

2. Blended learning

In the standard educational model, blended learning often refers to the use of laboratory equipment or computers to complement the class sessions and strengthen the teaching process through practice and the application of theories learned in class. Blended learning is an approach to education that combines online educational materials and opportunities for interaction online with traditional place-based classroom methods.

3. Peer Learning

Let students collaborate themselves. The greater the student interaction is encouraged; the faster the boundaries of authority will be broken. You can provide a short overview of the day's topic and give students a challenge to meet by the end of the class. The task may include answering a question or solving a problem. Let students break into small groups to chart out ideas and discuss ways to meet the challenge. By the end of class, let each group share what they've learned with their peers.

4. Wisely managed classroom

Computers, tablets, digital cameras, video conferencing technology, and GPS devices can all enhance a student's learning experience. Possible uses of wisely managed classroom technology include leveraging Skype to communicate with classrooms or guest speakers from around the world, or multimedia projects that allow students to explore subject matter using film, audio, and even using any software tool.

5. Educational Audio & Video tools

It has been found that the use of educational audios and videos during class has improved the engagement levels of students and thus has created a greatly enhanced learning experience. Relevant videos keep students more alert, motivated and focused on the specific topic in hand. Visual content can enhance memory knowledge and students ability to retain new information. This facilitates active learning, retention of knowledge and information.

6. Spaced Learning

Amazing results were reported when it came to spaced learning. This is a unique learning method, where highly concentrated summary of lessons or content is repeated thrice by students. There are 2 ten minute breaks in between. During these breaks, distractor activities which might include physical or other entertaining activities are performed by the students. This way of teaching encourages students to quickly switch through activities, just like ten minutes of knowledge on the English literature with a PowerPoint presentation and then having 5 minutes of football. This may lead to get better grades. It is said that the method is more effective than traditional teaching. By incorporating digital media elements into the study materials and project, the students can learn better by this method.

7. Brainstorm

Make time for brainstorming sessions in your classrooms. These sessions are a great way to get the creative juices flowing. When you have multiple brains focusing on one single idea, you are sure to get numerous ideas and will also involve everyone into the discussion. These sessions will be a great platform for students to voice their thoughts without having to worry about right or wrong. Set some ground rules before you start. You can go for simple brainstorming or group brainstorming or paired brainstorming.

8. Classes outside the Classroom

Some lessons are best learnt, when they are taught outside of the classroom. Organize field trips that are relevant to the subject. Students will find this fresh and exciting. Without taking much effort, they will learn and remember what you teach them and in addition to that they will experience a real-time knowledge about the subject.

9. Think-Pair-Share

Explain to students that a -Think-Pair-Shareǀ allows them to activate their prior knowledge and share ideas about content or beliefs with peers. This structure gives students a chance to organize their ideas—first in their own minds, then in a smaller group setting before sharing with the entire group. In a Think-Pair-Share, students Think individually about the question or idea(s) put forth, Pair up with someone to discuss their thinking, and then Share their conversation with their table group, and then finally with the whole group.

10. Quick write

A prompt is posed for students to respond to in writing. Taking only 5 minutes or so, this is a quick way to accomplish one or more of the following: determine whether or not students have done the homework assignment, engage students in thinking about the topic that will be covered in the session, provides the opportunity for students to access their prior knowledge on a topic. The quick write can be graded to encourage students to do their reading assignment, or collected to serve as an attendance

check.

11. Turn and Talk

In a turn and talk, a question is posed to the class and students simply turn to the person next to them to discuss. This can serve as a comfortable way for students to share their ideas with others and set the stage for them sharing with the larger group. The instructor doesn't need to hear all (or any) of the ideas shared– the important aspect of this strategy is for the peers to share and for individuals to access their prior knowledge about a topic. Example prompt: Ask students to turn to someone next to them and discuss their responses to the following question. Tell them to take two minutes to discuss this with their partner with each person getting some time to talk.

12. Polling

Having students vote anonymously on what they perceive as the best explanation/answer to a question, followed by opportunities to discuss their ideas with peers, and then to vote again leads to greater learning of the material. It is important to have students discuss why they think their explanation is the most accurate and also why the other explanations proposed are not accurate. It is also important that the teacher looks at the polling results and listens to the reasoning of the students in order to determine what further explanations and summary might need to be made in lecture.

13. Individual/Group Quizzes

Give students a quiz that they complete individually and turn in to be graded. Immediately following the individual quiz, put students in small groups and have them take the quiz again, but this time they discuss the answers in their group and turn it in for a group score. Both quizzes are graded and if the group score is higher, the two grades are averaged. The group score can't hurt someone if they have a higher individual score. This encourages individual accountability, and also helps students to better understand the material as they discuss it with peers. In this way, they keep up with the material, rather than realizing they don't totally understand it when they reach the midterm.

14. Jigsaws

Students work in small groups to read information that has been organized into sections. Each student in the group reads one section of the material and then shares that information with the rest of their group. As they read and share information, they refer to prompts such as: what do you think each idea means? What is the big idea? How can this idea be applied to help understand the concept(s)? What questions do you have about what you read? What do you agree/not agree with?

There are various permutations of jigsaws. One such model include expert and cooperative groups: Each group can be assigned a particular aspect/part of the overall information – they read it individually and then discuss in their small -expertǁ group to make sure they all understand it. Then new cooperative groups are formed made up of one-two students from each of the original expert groups. In this way, the new groups have an -expertǁ representative from each of the original groups so that all of the information is now represented in the new cooperative group. The -expertǁ has had a chance to practice sharing and hearing other viewpoints about the information in their original group, and therefore likely feels more comfortable sharing in the new group.

15. Pausing in lecture

These strategy work towards inserting wait time in lectures for students to reflect on, discuss and apply ideas just presented and to encourage them to engage actively in the lecture rather than passively taking notes. These strategies also help students to understand what they do and don't understand about the lecture.

- ask students not to take notes as you work through a problem on the board with the class, followed by 5 minutes for them to copy down board and discuss the problem with peers.
- pause 6-10 seconds after asking a question before calling on a student to respond have students do a quick write about a concept just covered in lecture (e.g. their understanding, two questions they have about the concept as presented, what they would like to know more about etc.); optional, collect the quick write to help you better understand what they understood from the lecture and the questions they have and to keep them engaged.

16. Posters & Gallery walk

Give groups of students an assignment that they need to work on together and present their ideas on a sheet of chart paper. Once they have completed their poster, have them display it on the wall, much like at a scientific poster session. One of their groups will stay with the poster and help to explain it as the class circulates to look at all of the posters. Students take turns standing by their poster so that each of them has the chance to visit the other group's posters. This sets up a more interactive way of presenting as compared to ppt presentations.

17. Fish bowl

A fish bowl allows a small group of students to engage in a discussion about ideas or concepts that have alternative explanations while the rest of the class observes and takes notes. An inner circle of students engages in the discussion, while the rest of the class either sits in an outer circle, or remains in their regular seats and observes. If you have your class organized into small groups, then the members of each group can tap their respective teammate and replace them in the inner circle to expand on or provide additional evidence to support an explanation.

Optional: the entire class needs to take part in the inner circle conversation by the end of the class period.

18. Idea line up

The idea lineup is a structure that allows a teacher to use the diversity of perspectives in the classroom to generate heterogeneous groups of students for discussion. This diversity of thinking is a good place from which to develop a classroom climate that supports argumentation. The question should be one about which students have enough prior knowledge/experience to have some evidence to bring to bear in the discussions.

19. Mind Map

A mind map is a diagram used to visually organize information. A mind map is hierarchical and shows relationships among pieces of the whole concept. It is often created around a single concept, drawn as an image in the center of a blank page, to which associated representations of ideas such as images, words and parts of words are added. Major ideas are connected directly to the central concept, and other ideas branch out from those major ideas. Mind maps can also be drawn by hand, either as "notes" during a lecture, meeting or planning session or as higher quality pictures when more time is available.

Impact and Benefits of various Pedagogies

- Improvement in students motivation Enhanced Learning experience
- Extended potential for the learning of course. Development of teamwork and communication skills.
- Advancement in higher-level thinking, self-management and leadership skills. Progression in student-faculty interaction.
- Understanding of course with diverse perspectives

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LIST OF PEDAGOGY METHODS CARRIED OUT IN VARIOUS COURSES

S.No	Faculty Name	Course Name	Pedagogy Method Used
CAY 2023 -2024			
1.	Dr.P.S.SenthilKumar, Associate Professor	Process Engineering of Fruits and Vegetables	Peer learning
2.	Mr.V.R.Vellingiri, Assistant Professor	Theory of Machines	Reflective Approach
3.	Mr.V.Bharath, Assistant Professor	Computer Aided Design & Drawing Lab	Peer Learning
4.	Mr.A.Sivakumar, Assistant Professor	Fluid Mechanics	Mind Map
5.	Mr.D.Logachandran, Assistant Professor	Groundwater and Well Engineering	Collaborative Learning
6.	Mr.S.Arunkumar, Assistant Professor	Strength of Materials for Agricultural Engineering	Think pair share
7.	Mr.C.Manoj Prabhu, Assistant Professor	Agriculture Waste Management	Reflective Approach
8.	Mrs.M.Vaijayanthi, Assistant Professor	Hydrology, Soil and Water Conservation	Peer learning
9.	Mr.S.RameshKumar Assistant Professor	Post Harvest Technology	Mind Map
10.	Mr.M.Tamilselvan, Assistant Professor	Entrepreneurship in Agriculture Engineering	Thin pair share
11.	Mr.R.Rajaprakasam, Assistant Professor	Unit Operations in Agricultural Processing	Mind Map

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S.No	Faculty Name	Course Name	Pedagogy Method Used
CAY 2022 -2023			
1.	Dr.G.Vijayakumar, Professor, HOD	IoT in Agricultural Systems	Peer Learning
2.	Mr.V.R.Vellingiri, Assistant Professor	Tractor and Farm Engines	Collaborative Learning
3.	Mr.V.Bharath, Assistant Professor	Heat and Mass Transfer for Agriculture Engineering	Peer Learning
4.	Mr.A.Sivakumar, Assistant Professor	Strength of Materials for Agriculture Engineering	Mind Map
5.	Mr.A.V.Gowtham, Assistant Professor	Climate Change and Adaption	Reflective Approach
6.	Mr.C.Manoj Prabhu, Assistant Professor	Surveying and Leveling	Think Pair Share
7.	Mrs.M.Vaijayanthi, Assistant Professor	Fluid Mechanics	Reflective Approach
8.	Mr.D.Logachandran, Assistant Professor	Special Farm Equipment	Peer learning

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S.No	Faculty Name	Course Name	Pedagogy Method Used
CAY 2021 -2022			
1.	Dr.G.Vijayakumar, Professor, HOD	Seed Processing Technology	Collaborative Learning
2.	Mr.A.Sivakumar, Assistant Professor	Renewable Energy	Collaborative Learning
3.	Mr.A.V.Gowtham, Assistant Professor	Agriculture Economics	Mind Map
4.	Mr.P.Sudhakar, Assistant Professor	Food and Dairy Engineering	Mind Map
5.	Mr.V.R.Vellingiri Assistant Professor	Farm Machinery and Equipment	Mind Map
6.	Mr.M.Kumaravel, Assistant Professor	Engineering Thermodynamics	Peer Learning