



**GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY**  
**Department of Computer Science and Engineering**

### **Innovations by the Faculty in Teaching and Learning**

Education is undeniably one of the most important aspects of life. As we grow up, education can help us to develop as people, learning new life skills and improving our knowledge to earn better livelihood. Students are considered as empty vessels who passively receive information from teachers. Modern society demands high quality teaching and learning from teachers. Teachers have to possess a great deal of knowledge and skills with regard to both teaching and assessment practices in order to meet those demands and standards of quality education. Learning is classified in two ways. They are teacher centric and learner centric.

Conventional education system or traditional education system is kind of method that involves teaching through face to face to students on daily basis between teacher and a student. The students are taught and on the same subject students are judged and based on grading they will be promoted to the next level. Teachers are considered as a role model for students. This method of teaching is known as teacher centric method. Teacher using chalk and talk for teaching and it is only one way flow of information. Teachers continuously speak for an hour without knowing the feedback and response from the students. Interaction between teacher and students will be very minimal.

#### **Modernization in Teaching Learning**

Learning centric method is also known as outcome based education. Lot of activities are involved during the course which makes the learning more interesting and active. To overcome the drawbacks of teacher centric methods there are many new innovative approaches in learner centric methods. These methods are known as collaborative learning methods or cooperative learning. In Collaborative learning two or more people learn something together where all the members interact by sharing.

The role of Information and Communication Technology (ICT), in the education system plays an important role. Use of ICT in teaching learning process makes the class room sessions more effective and it also improves the quality of teaching.

Contributions to teaching and learning are activities that contribute to the improvement of student learning. These activities may include innovations not limited to, use of ICT, instruction delivery, instructional methods, assessment, evaluation and inclusive class rooms that lead to effective, efficient and engaging instruction.

The department consists of dedicated, qualified and experienced faculty and supporting staff in various fields of Computer Science and Engineering. All the staff members meet the

requirements as prescribed by AICTE and JNTUA University. Various pedagogical activities have been followed by the faculty for the student in order to create interest over the subjects and the developing technologies.

Department has about 6 ICT-classrooms from where the lectures are delivered through PPT, chalk and talk. There is a system of Daily Home Assignments which are given at the end of every theory class. These provide an opportunity to further dig deeper into the content covered in the class on a particular and / or provide an opportunity to reflect on the material. These are evaluated and returned to the students in the next class so that they get immediate feedback on what they have understood and what they have not understood properly. This is continuous evaluation at its best and inculcates regularity and punctuality on the students. Some teachers use on-line evaluation tools such as CMS or Teachmint APP for continuous evaluation.

The following are the various teaching methodologies used in different aspects for the delivery of course:

<b>S.No</b>	<b>Innovation By Faculty</b>	<b>Subjects</b>
1	Online Platform-Teachmint, Wise App	All Subjects
2	You tube video channel	Data Structures, Python, Design and Analysis and Algorithms
3	Jigsaw Method	Computer Organization
4	Online Platform-Code Tantra	C, Data Structures
5	NPTEL Videos	Discrete Mathematics, Design and Analysis of Algorithms
6	College Management System (CMS)	All Subjects
7	Spoken Tutorials	Java, Python, Linux
8	Quiz	Formal Languages and Automata Theory, Discrete Mathematics
9	Role Play	Data Structures
10	Case Study	Python Programming, Python Programming and Data Science
11	Virtual Labs	Software Engineering, Cryptography and Security
12	Simulation Tool	Mobile Application Development
13	Demonstration through Prototype	IT Workshop
14	Seminars	All Subjects
15	Assignments	All Subjects
16	Guest Lecture	Information Security, Big data
17	Industrial Visits	
18	Workshop/Hands on Training	Python, Drone, Big data using Hadoop, Artificial Intelligence, Data Analysis using Python

19	Practical Experiments	
20	Muddiest point	All Subjects
21	Pros and Cons	All Subjects
22	Problem solving tasks	FLAT, DM
23	Interviews	Management Science
24	Think pair share	FLAT
25	Summarization of topic	All Subjects
26	Memory Games	Software Engineering, Software Project Management
27	Project Expo	
28	Student Voice Association Activities	
29	Internships	
30	Brain Storming	All Subjects
31	Mind Map	Object oriented analysis and Design,PPL
32	Problem Solving	Mathematical foundation and Computer science, FLAT
33`	Power Point Presentation	All Subjects
34	Group Discussion	Design Thinking
35	Paper Publications	

### Teaching Methodologies used by Faculty

#### **Lecture Method and Interactive Learning:**

- Audiovisual aids, chalk, and board are used by the faculty for teaching.
- Students are encouraged to clarify their doubts, during the lecture hour itself.
- Tutorial Sessions for Problem-Oriented subjects are done by two faculty members.
- During the lecture hour, first 5 minutes are used for revising topics taught in the previous class that too done by the students and the last 5 minutes is used to give a summary of the current class. Hence the students will get continuity of the previous day topics.

#### **Application Based Learning:**

- Students are encouraged to attend workshops. As an outcome of the workshop, interested students will develop Projects/ Apps at the end of the workshop.
- Students are encouraged for an internship in the industry during vacations.
- Students are taken to industrial visit at least once a year to see the real-time operation.

#### **Practical Learning:**

- Practical exercises are taught in the laboratory.
- In addition to the experiments given in the syllabus, students are instructed to practice additional experiments as suggested by the concerned by the faculty.
- Software's like Android Studio, Oracle, Net Beans, Eclipse, Argo UML are used in the development of applications.

- Laboratories are accessible for the students during the scheduled periods and also during leisure hours for doing experiments.
- Charts are displayed in laboratories through which the students can gain a basic idea about different Software packages.
- Students are taken to the industries through industrial visit through that acquiring the knowledge about the real-time applications.
- Virtual Labs sessions are provided during internet hours.

### **ICT classroom:**

- All classrooms are equipped with projector facility.
- All laboratories and classrooms have Wi-Fi access.

### **Other Innovative Teaching methods adopted by the faculty:**

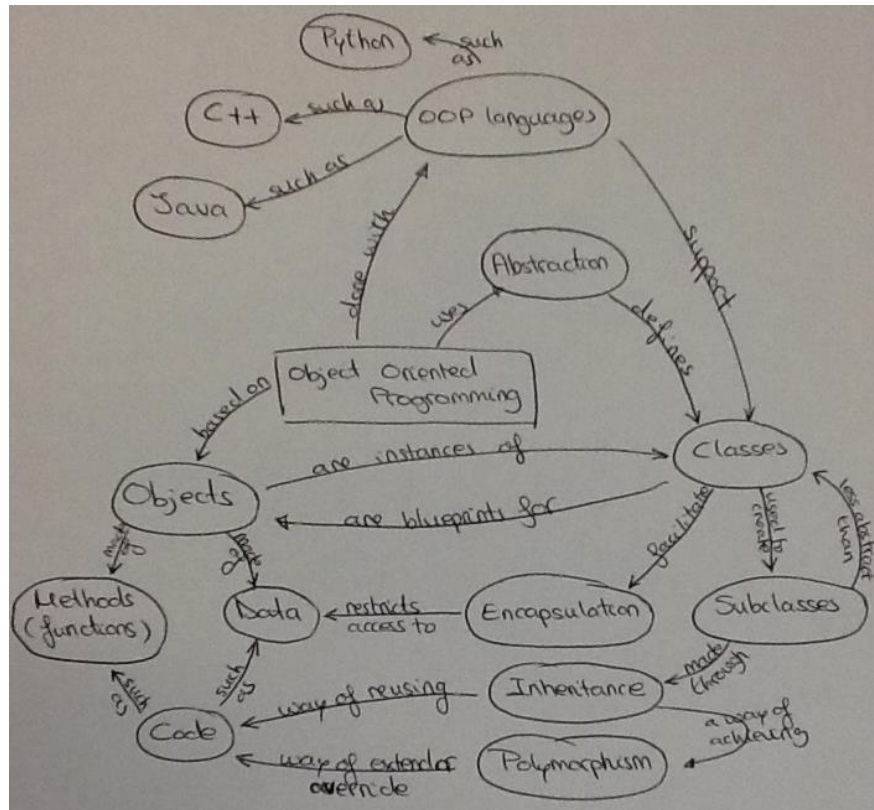
- *Real-Time Demonstration* – Models are displayed in laboratories.
- *Industry Projects*– Students are encouraged and guided by faculty members to do real time projects in various industries during their final semester.
- *Online courses* – Online courses are being conducted through NPTEL online courses and eduskills, ICT so that students can post and clear their doubts at any time without hesitation and can download course materials.
- *College automation software* – Each student is provided with a personal login wherein they can download Course Material, Syllabus, Question bank, Assignment topics.

### **Brainstorming**

Every student in the class is encouraged to think aloud and suggest as many ideas as possible, no matter seemingly how outlandish or bizarre. Analysis, discussion, or criticism of the aired ideas is allowed only when the brainstorming session is over and evaluation session begins.

### **Mind Map**

Mind map is a visual tool used to organize information graphically. It is hierarchical and represents relationships among parts of the whole. A mind map usually begins with a single concept, and then drawn as an image in the center of a blank page, where associated representations ideas will be added, such as words and images. Main ideas will be connected directly to the central concept, and other sub topics branch out from the major ones. Mind mapping helps to think, collect knowledge, remember and create ideas.



Mind mapping for Object Oriented Programming

## Video Lecture

Video lecture is a modern method of learning which comes with numerous benefits of its own. This method is individual focused, easy for teachers, and keeps the students interested in the whole process. Video lectures are one such way, using which students can improve the overall learning experience of classroom. With video lectures, students can learn anywhere from their mobile devices: laptops, tablets or smart phones. With video lectures, all students can learn at their own individual pace, which will maximize the results of e-Learning.

## Role Play

Role play is a technique that allows students to explore realistic situations by interacting with other people in a managed way in order to develop experience and trial different strategies in a supported environment. Depending on the intention of the activity, participants might be playing a role similar to their own or could play the opposite part of the conversation or interaction.

## Key benefits of role play

- Develops communication and language skills
- Allows students to act out and make sense of real-life situations
- Allows students to explore, investigate and experiment
- Develops social skills as students collaborate with others
- Students learn to empathise with others; Helps children learn about different cultures

- Encourages students to express their ideas and feelings in a relaxed environment
- Sparks creativity and imagination



Role Play activity in Linked List

### **Fish Bowl**

Students will be given a topic to study and research. Then a small group of students will start discussing the topic while others will sit around them taking notes and not contributing. The students in the middle are fish and others are bowl. This method is applied for the subjects like Software engineering, Object Oriented Analysis and Design.

### **Jigsaw**

The “Jigsaw” is a teaching strategy of organizing student group work that helps students collaborate and rely on one another. This teaching strategy is effective for accomplishing multiple tasks at once and for giving students a greater sense of individual responsibility. In groups of five, assign a brief unique reading either in-class or out-class. The group is given a general topic to discussion, and each participant takes a turn discussing it from the viewpoint of their unique reading.



Jigsaw activity

### **Group discussion**

Group discussion provides opportunities for student to speak in front of others and receive feedback from them. It increases active participation of everyone and provides platform to express their ideas. Our students are encouraged to participate and express their ideas in technical activities, technical debate and so on.

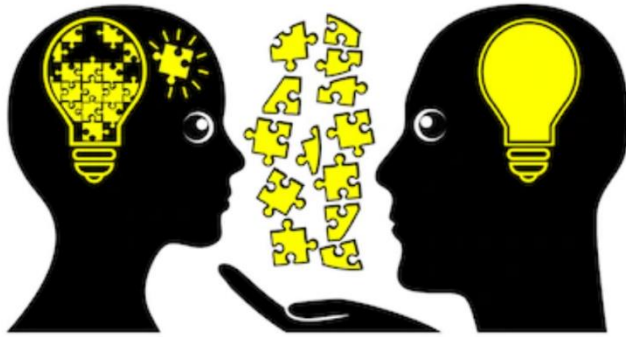


Group Discussion

### **Peer to Peer Learning**

It is considered as ‘student-to-student’ support system. In this system, the students will be formed as a group and each one of the group will assist others to learn. There will be a leader for each group who is taking care of the discussion named as Peer Assisted Leader (PAL). For the

problematic subjects such as Theory of Computation, Design and analysis of algorithms and mathematics subjects our students are using this method for better understanding.



Peer to Peer Learning