Innovation by the Faculty in Teaching and Learning

A. The work must be made available on Institute Website

The innovations in teaching learning are available on the institute website [http://mitmysore.in/](http://mitmysore.in/). The websites contains best teaching and learning practices at the department. Some of the teaching learning practices are given below:

Use of ICT tools in to enhance the teaching learning process
- Use of ICT as classroom technology
- ICT implementation in online learning

Instructional methods
- Lecturing
- Demonstrating
- Collaboration
- Class room discussion

The faculty and the student has given the awareness to access the website and make use of the information available. The website also gives the information about the laboratory facilities at the department, Information regarding industrial visits, Workshops conducted at the department, Publication details, Sample schemes for the internal assessment and news letter summarizing the extra and co-curricular activities for the previous year.

B. The work must be available for peer review and critique

The Department Accreditation Committee plays a major role in improving the teaching-learning process. The committee monitors each academic activity in the department and ensures that the same is taking place as per the schedule. The Department Accreditation Committee reviews and critiques the best teaching learning practices at the department at beginning of the each semester.

➢ The academic progress of the students, the marks scored in the internal assessments test as well as the attendance is communicated to the parents by the department.

➢ A parents meeting is conducted for the students who failed to secure threshold marks in the internals as well as shortage of attendance and the feedback is given to the students in presence of their parents. Such meeting help to enhance their academic performance in the future.
➢ Further slow learners are identified. The slow learners are instructed to attend remedial classes. All the above activities take place effectively in time.

➢ The Department Accreditation Committee primarily monitors the conduction of regular theory and practical classes, syllabus coverage, delivery mechanism and conduction of internal assessment tests at appropriate intervals during the semester.

➢ Mechanism Models such as Aucellier Mechanism, Four Bar Mechanism and Pantograph helps students to understand concepts of Kinematics of Machines

C. The work must be reproducible and developed further by other scholars

➢ The final year projects of both UG and PG can be extended and developed further by subsequent batch students.
➢ The selected final year projects of both UG and PG kept as demo models in the departments

Few examples of reproducing and developing further of the work are as follows:

➢ The Oil Fired Furnace developed by the final year project students is used to demonstrate to melt the material for casting in foundry and forging laboratory.
➢ The wear testing machine developed by the UG students as part of their project is to conduct experiments

![Figure 5.3: Projects developed by UG students being used in laboratories](image-url)
D. Statement of clear goals, use of appropriate methods, significance of results, effective presentation and reflective critique (10)

Best Practices at the department to enhance teaching and learning:

At the Department of Mechanical Engineering, our faculty members adopted and practicing the various innovations in teaching and learning that ensures effective, efficient and engaging instruction. Following are some of the activities that contribute to the improvement of student learning. The work is available on the institute website.

1. Information and Communication Technology [ICT]:

The new developments in the information technologies have opened up fresh prospective in teaching and learning. At the department we make use of various ICT tools in order to improve instruction methods.

Use of ICT as class room technology:

Use of ICT as class room technology includes information presentation through overhead / LCD projectors and Television etc (Figure 5.4)

Figure 5.4: Use of ICT as classroom technology

ICT implementation in online learning:

The National Program on Technology Enhanced Learning [NPTEL] is an initiative by seven IIT’s and IISc for creating course contents in engineering and science. They create contents for numerous courses as web based supplements and many complete video courses, for forty hours of duration per course.

At the department faculties often refers to the NPTEL course contents which will be useful for teacher training and through them improve the quality of students. In addition, the course materials (both web and video) are freely accessible on NPTEL website. Following table shows the information about the online courses successfully completed on NPTEL by faculty members at the department.
2. **Instructional Methods:**
   - **Lecturing:**
     At the department faculty members follow the black board teaching method of the syllabus prescribed by the university according to the lesson plan.

   - **Demonstrating:**
     Demonstration helps to prove a fact through a combination of visual evidence and associated reasoning. Demonstrations help to raise student interest and reinforce memory retention because they provide connections between facts and real-world applications of those facts. Demonstrating instruction method means teaching through examples or experiments.

     At the department while teaching Computer Aided Engineering Drawing 3D shapes (ex. Pyramids, Prisms) and are used to convey the concepts of drawing (Figure 5.5). At the department we have automobile parts (ex. Engine block, Axle, Cylinder-Piston assembly) which help students to see, experience and learn the concepts (Figure 5.6).

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Faculty Name</th>
<th>Online Certification Course</th>
<th>Agency</th>
<th>Mode of Learning and Year</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Prof. Chethana G D</td>
<td>Refrigeration and Air Conditioning</td>
<td>NPTEL</td>
<td>Online 2017-18</td>
<td>Completed Successfully</td>
</tr>
</tbody>
</table>

Table 5.6: List of faculty completed online NPTEL course

Figure 5.5: 2D and 3D Shapes help to convey the Engineering Drawing Concepts to students
Collaborating:

Students conduct experiments in groups in various laboratories during their course. This collaborative method allows students to actively participate in learning process. Final year students carry out a group project as a part of the curriculum, which is an example of collaborative teaching method. This helps teacher to assess student’s abilities to work as a team, leadership and presentation skills.
• **Classroom Discussion:**

At the department faculties facilitate for the discussion of the topics in groups.

Table 5.7: Innovations in Teaching and Learning

<table>
<thead>
<tr>
<th>Statement of clear goals</th>
<th>Use of appropriate methods</th>
<th>Significance of results</th>
<th>Effective Presentation</th>
<th>Reflective Critique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective, Efficient and Engaging Instruction</td>
<td>Use of ICT</td>
<td>Helps students to grasp concepts easily</td>
<td>Power point Presentations, LCD TV</td>
<td>Students Understanding</td>
</tr>
<tr>
<td>Instruction Methods</td>
<td>Lecturing</td>
<td>Enhances understanding</td>
<td>Conveying information according to lesson plan in classroom</td>
<td>Student response</td>
</tr>
<tr>
<td></td>
<td>Demonstrating</td>
<td>Understand theoretical concepts with experiments/Working Models/Charts etc.</td>
<td>Teaching through examples and experiments</td>
<td>Class participation</td>
</tr>
<tr>
<td></td>
<td>Collaborating</td>
<td>Work as a team, Leadership skills and Presentation abilities</td>
<td>Group projects and discussions</td>
<td>Teachers and Project guide Feedback and Project Evaluator assessment</td>
</tr>
<tr>
<td></td>
<td>Class Room Discussion</td>
<td>Increases student understanding, Broadens student perspective</td>
<td>Discussion after presentation and lectures</td>
<td>Student participation in discussions</td>
</tr>
</tbody>
</table>