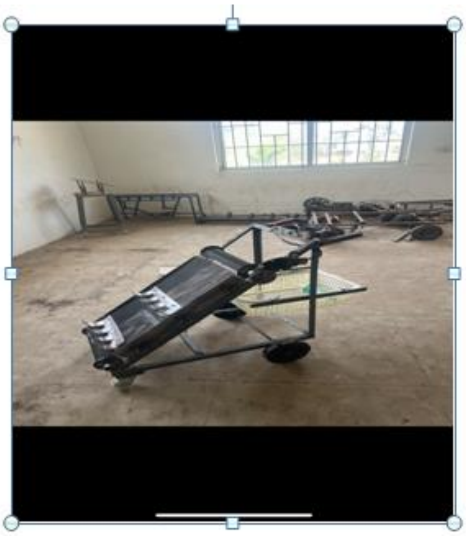
PROJECT BASED LEARNING (PBL) METHODOLOGY

Mechanical Engineering Department

Introduction

Project Based Learning (PBL) is a student-centered instructional approach implemented in the Mechanical Engineering Department to strengthen students' practical skills, design capabilities, and analytical thinking. Through this method, students engage in solving real-world mechanical engineering challenges related to areas such as thermal engineering, manufacturing technology, machine design, fluid mechanics, and automation systems. By participating in project activities, students are able to connect theoretical knowledge with practical applications, thereby enhancing their technical proficiency, creativity, and innovative thinking.



Objectives

- To develop analytical and problem-solving skills in mechanical engineering.
- To encourage teamwork, collaboration, and communication among students.
- To apply theoretical knowledge to real industrial and mechanical engineering problems.
- To promote innovation, design thinking, and research in mechanical engineering.
- To enhance students' ability to design, analyze, and optimize mechanical systems.

Scope

This methodology is applicable to courses in Mechanical Engineering, including:

- Thermodynamics and Heat Transfer
- Fluid Mechanics and Fluid Machinery
- Manufacturing Technology and Production Engineering
- Machine Design and Mechanics of Machines
- CAD/CAM and Computer-Aided Engineering
- Industrial Engineering and Operations Management

Projects may be carried out individually or in groups, depending on the course requirements.

Responsibilities

Head of the Department (HoD)

- Approves and monitors Project Based Learning activities.
- Ensures proper implementation of PBL across relevant courses.

Faculty Coordinator / Course Instructor

- Identifies suitable project topics related to mechanical engineering applications.
- Guides students throughout the project work.
- Monitors progress and provides technical support.
- Evaluates student performance based on project outcomes and reports.

Students

- Select or are assigned project topics related to mechanical engineering problems.
- Conduct literature review, design analysis, experimentation, and simulation.
- Prepare project reports and present findings.
- Work collaboratively to complete project objectives within the given timeline.

Procedure

1. The faculty identifies project topics related to mechanical engineering such as machine design, thermal system optimization, renewable energy systems, manufacturing process improvement, robotics, or automation.
2. Students form groups or work individually to select a project topic.
3. Students perform literature review, data collection, design calculations, simulations, and experimental analysis related to the selected topic.
4. Faculty members guide students during each phase of the project.
5. Students prepare project reports, models, or prototypes based on their work.
6. Projects are evaluated through presentations, demonstrations, and documentation.

Outcomes

- Improved practical understanding of mechanical engineering concepts.
- Enhanced teamwork, communication, and project management skills.
- Development of design and innovation capabilities.
- Better industry readiness and problem-solving ability among students.