

PEER GROUP LEARNING (PGL) METHODOLOGY

Mechanical Engineering Department

1. Purpose

Peer Group Learning (PGL) is introduced in the Mechanical Engineering Department to encourage collaborative and learner-centered education. It aligns with Outcome Based Education (OBE) by motivating students to actively engage in discussions and gain a deeper understanding of fundamental mechanical engineering subjects such as thermodynamics, fluid mechanics, manufacturing technology, and machine design, which ultimately enhances their conceptual knowledge and academic performance.



2. Scope

This procedure applies to:

- Undergraduate and postgraduate programs in Mechanical Engineering.
- Both theory subjects (e.g., Engineering Mechanics, Heat Transfer, Dynamics of Machines).

- Laboratory courses (e.g., Fluid Mechanics Lab, Manufacturing Technology Lab, CAD/CAM Lab).
- All students and faculty members in the Mechanical Engineering Department.

3. Procedural Steps (Mechanical Engineering Adaptation)

Step 1: Identification of Topics

Identify Mechanical Engineering topics that require:

- Concept clarity: Understanding stress–strain relationships, thermodynamic cycles, or fluid flow behavior.
- Problem solving: Solving numerical problems related to heat transfer, machine design, or kinematics of machines.
- Application-based learning: Analyzing real engineering systems such as automobile engines, turbines, and manufacturing processes.

All selected topics must align with the Course Outcomes (COs) of the respective subject.

Step 2: Formation of Peer Groups

- Students are divided into small heterogeneous groups of 4–6 members.
- Each group includes high-performing students, average learners, and slow learners to promote knowledge sharing.
- A Peer Leader is assigned to coordinate discussions and guide the group.

Step 3: Orientation and Guidelines

- Faculty explain the importance and benefits of peer learning in understanding engineering concepts.
- Roles are assigned within the group such as:
 - Discussion Leader
 - Note Recorder
 - Presenter
- Students are encouraged to actively participate, ask questions, and explain concepts to peers.

Step 4: Learning Material Distribution

Learning materials are provided through Google Classroom, ERP, or the departmental LMS, including:

- Study materials: Notes on thermodynamic cycles, fluid mechanics principles, and manufacturing methods.
- Problem sets: Numerical problems related to machine design, strength of materials, and heat transfer.
- Case studies: Industrial applications such as automobile engine performance, CNC machining, and renewable energy systems.

Step 5: Peer Discussion and Learning

- Students discuss the assigned topic within their groups.
- Members collaboratively solve numerical problems and analyze engineering concepts.
- Peer leaders ensure all members understand the topic.

Step 6: Presentation and Faculty Interaction

- Each group presents their findings or solutions to the class.
- Faculty provide clarifications, feedback, and additional insights on the discussed topics.
- This step strengthens understanding and corrects misconceptions.

Step 7: Assessment and Feedback

- Faculty may conduct short quizzes, assignments, or presentations to evaluate learning outcomes.
- Feedback is provided to improve the effectiveness of peer learning sessions.

4. Expected Outcomes

Implementation of PGL in Mechanical Engineering aims to:

- Improve conceptual understanding of mechanical engineering subjects.
- Enhance problem-solving and analytical skills.
- Develop teamwork, communication, and leadership abilities.
- Improve academic performance and attainment of Course Outcomes (COs) and Program Outcomes (POs).