# PROJECT I
# ENCH 415

**Credit: 2** **Year: IV** **Part: I**

**Course Objectives:**

Project I focuses on the systematic identification, conceptual design and planning of chemical engineering problems. Students learn to apply research methods to implement chemical engineering design projects. The objective is to develop a technically sound proposal that addresses issues such as piping and instrumentation diagram, reactor design, mass and heat transfer and plant design and economics within the core disciplines of chemical engineering. Students will implement a structured methodology to develop a detailed engineering design.

**General Procedures:**

a. **Problem Identification and Proposal (1-4 weeks):** Students are organized into collaborative groups (typically four members). Groups select a specific chemical engineering problem or technological challenge such as process inefficiency, energy consumption, waste minimization, process safety, reactor performance, separation efficiency, environmental pollution, renewable energy and the development of sustainable chemical processes. They prepare a preliminary proposal covering topics throughout the curriculum. Students may also seek guidance from available faculty members for project ideas.

b. **Proposal Presentation and Supervision:** The proposal must include a review of existing research and technical standards to justify the study and identify specific technical gaps the project aims to address. Each group selects a faculty supervisor who provides technical guidance based on the group's chosen chemical engineering focus area.

c. **Methodology and Technical Design (5-12 weeks):** Groups define a systematic engineering approach, detailing the specific data collection techniques, analytical frameworks and modelling tools required for the project. Depending on the project's scope, students execute conceptual designs, mathematical modelling and computer modelling/simulations to demonstrate the technical viability of their proposed solution.

d. **Mid-Term Defense and Evaluation:** The semester concludes with a formal presentation. Students must defend their methodology and design components demonstrating that the project is well-planned and technically sound. Successful completion and validation of the planning phase are mandatory prerequisites before students can proceed to the implementation phase in Project II. The exact date for the mid-term defense is determined by the project committee and generally occurs one or two weeks before the end of the semester.

Throughout the course, the faculty will serve as a supervisor providing continuous feedback and conducting regular reviews to ensure technical viability and professional documentation standards are maintained.

**Evaluation Scheme:**

| Evaluation methods | Marks | Remarks |
|---|---|---|
| Continuous Technical Assessments | 10 | Evaluation of the detailed literature review, problem formulation and weekly progress log submitted to the supervisor. Assessment focuses on the student's ability to identify research gaps or local chemical engineering related industrial challenges and the logical transition from theoretical concepts to a validated technical model setup. |
| Technical Project Documentation | 15 | Assessment of the literature survey depth and the technical accuracy of the proposed engineering plan. This includes the selection of appropriate analytical tools, data collection methods or simulation frameworks that are to be evaluated by project committee. |
| Oral Defense and Presentation | 25 | A formal oral defense and presentation with report submission. Focus is on the group's ability to justify project feasibility, defend the engineering approach and prove that the plan is technically ready for the implementation phase in Project II. |
| **Total** | **50** | |