

Final Project and Presentation Requirements

CBE 30235: Introduction to Nuclear Engineering

Spring 2026

Project Overview

The capstone of this course is a comprehensive group project consisting of a formal technical report and an oral presentation. You will work in your established groups of three to investigate a specific, advanced topic within the field of nuclear engineering.

1 Learning Objectives

This project is designed with a four-fold purpose:

- 1. Technical Mastery:** Develop a deep, rigorous understanding of a chosen nuclear engineering topic and articulate how it relates to the foundational principles covered in this course.
 - 2. Oral Communication:** Gain practical experience in the oral presentation and defense of technical research.
 - 3. Document Preparation:** Master \LaTeX , the industry and academic standard for preparing highly technical, math-heavy documents.
 - 4. Modern Tool Utilization:** Master the ethical and effective use of Artificial Intelligence (AI) tools (e.g., Large Language Models) in the research, drafting, and editing of a technical report.
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2 The Final Report

2.1 Length and Formatting

- **Word Count:** The main body of the text must be between **6,000 and 7,500 words**. This count applies to **prose only**. Equations, tables, figures, code snippets, and references do *not* count toward this total.
- **Software:** The report **must** be written and compiled using \LaTeX .
- **Structure:** The report should follow a standard technical paper structure (Abstract/Executive Summary, Introduction, Background/Theory, Main Analysis, Conclusion, References).
- **References:** References should all have embedded hyperlinks to verified urls accessible from the final compiled document (PDF).

2.2 AI Usage and The "Iterative" Requirement

Because mastering AI tools is a core objective of this project, the use of AI for brainstorming, structuring, drafting, and formatting L^AT_EX is expressly permitted and encouraged.

However, you will quickly discover that current AI models cannot generate a cohesive, accurate 7,000-word technical engineering document in a single prompt. The length of this paper is deliberate. To succeed, you must learn to use AI iteratively: building comprehensive outlines, generating text section-by-section, manually verifying any equations and references, and synthesizing the final document yourselves. Your document will be evaluated for clarity - make sure that it is as concise and clear as possible, particularly avoiding the AI bloat which often occurs in longer documents. You are strictly responsible for the accuracy of your output.

Your report must include a mandatory **AI Methodology Appendix** (not included in the word count) detailing:

- Which AI tools were used (e.g., ChatGPT, Gemini, Claude).
- How they were utilized (e.g., generating L^AT_EX code, editing prose, explaining concepts, section-by-section drafting).
- The verification process you used to ensure all AI-generated technical claims, equations, and citations were factually accurate and free of hallucinations.

3 The Oral Presentation

During the final three class days of the semester, each group will present their findings to the class.

- **Duration:** Exactly **18 minutes** of presentation time, followed by a brief Q&A session.
- **Participation:** The presentation time must be divided equally among the three group members (approximately 6 minutes of speaking time per student).
- **Content:** The presentation should highlight the core engineering principles, key findings, and relevance of your topic. Do not simply read your paper; use visual aids effectively to teach the class about your subject.

4 Timeline and Deliverables

- **Friday, March 20:** Final deadline for all groups to have their topics approved.
- **Monday, March 30:** AI assisted study guide and literature survey due.
- **Wednesday, April 8:** Project Outline and initial L^AT_EX framework due.
- **April 24, 27 & 29:** Oral Presentations. PDF of slides provided as well.
- **Wednesday, April 29:** Final L^AT_EX Report (PDF and .zip file of source code) due.