Copilot

MECH320 - Thermodynamics and Heat Transfer Project

University: Southern Polytechnic Institute

Course Duration: Full Year (Fall and Winter)

Instructor: Dr. David Clark

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Office Hours: Tuesdays and Thursdays, 2:00 PM - 4:00 PM

Course Description

In this third-year course, students apply thermodynamics and heat transfer principles to design and optimize a thermal system, such as a heat exchanger or a refrigeration system. The course emphasizes hands-on experience with thermal system design, analysis, and optimization.

Learning Outcomes

By the end of this course, students will be able to:

1. Apply thermodynamic principles to the design of thermal systems.
2. Analyze heat transfer mechanisms and their impact on system performance.
3. Optimize thermal systems for efficiency and effectiveness.
4. Conduct experimental validation and analysis of thermal systems.
5. Communicate design concepts and results through written reports and oral presentations.

Course Timeline and Deliverables

Fall Semester:

Date	Deliverable	Description	Weight
September 15, 2020	Team Formation and Project Proposal	Teams form and submit a proposal outlining the project scope and objectives.	10%
October 20, 2020	Thermodynamic Analysis Report	Detailed analysis of the thermodynamic cycles and processes involved.	15%
November 25, 2020	Heat Transfer Analysis Report	Analysis of heat transfer mechanisms and their impact on system performance.	15%
December 10, 2020	Midterm Progress Report	Report on progress, challenges, and next steps.	10%

Winter Semester:

Date	Deliverable	Description	Weight
February 15, 2021	Detailed Design Document	Comprehensive design document with detailed drawings and specifications.	15%
March 20, 2021	Prototype Development and Testing Report	Report on prototype development and testing results.	20%
April 10, 2021	Final Presentation and Demonstration	Final presentation and demonstration of the thermal system project.	15%

Grading Breakdown

- Team Formation and Project Proposal: 10%
- Thermodynamic Analysis Report: 15%
- Heat Transfer Analysis Report: 15%
- Midterm Progress Report: 10%
- Detailed Design Document: 15%
- Prototype Development and Testing Report: 20%
- Final Presentation and Demonstration: 15%

Total: 100%

Course Policies

- **Attendance:** Regular attendance is required. More than three unexcused absences may result in a lower grade.
- **Late Submissions:** Assignments submitted late will incur a penalty of 5% per day, up to a maximum of 25%.
- **Academic Integrity:** All students are expected to adhere to the university's academic integrity policy. Plagiarism or cheating will result in disciplinary action.

Required Materials

- Textbook: "Fundamentals of Thermodynamics" by Richard E. Sonntag and Claus Borgnakke
- Access to thermal system simulation software (e.g., ANSYS, MATLAB)
- Prototyping materials (to be specified based on project requirements)

Additional Resources

- University Library
- Thermodynamics and Heat Transfer Lab
- Online tutorials and workshops

This syllabus provides a comprehensive overview of the MECH320 course, including key elements such as learning outcomes, a detailed timeline with deliverables, and their respective weights. If you need any further details or adjustments, feel free to ask!