

JAMESTOWN COMMUNITY COLLEGE
State University of New York

INSTITUTIONAL COURSE SYLLABUS

Course Title: Mechanics of Energy Systems

Course Abbreviation and Number: MCT 2270

Credit Hours: 4

Course Type: Lecture/Lab

Course Description: Students will analyze and solve problems involving thermodynamic systems. Students will study thermodynamic processes, including cycles. Applications will focus on fluid dynamics and energy conservation, and heat transfer.

Prerequisite: PHY 1500, Eligibility MAT1600.

Student Learning Outcomes:

Students who demonstrate understanding can:

1. Evaluate properties of pure substances using thermodynamic tables, phase diagrams, and ideal gas formulae.
 2. Perform the calculations for the energy balance on a thermodynamic system undergoing a change of state.
 3. Solve the thermodynamic states and heat and work requirements of thermodynamic cycles, including Steam Power cycle (Rankine) and Vapor-Compression cycle (refrigeration).
 4. Research various field of alternative and green energy systems.
 5. Apply the concepts of thermodynamics to applications in fluid flow and heat transfer.
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Topics Covered:

- Systems of Units and the Need for Dimensional Consistency
 - Fluid Properties
 - Fluid Statics
 - Steady Flow Energy Balance
 - Applications of the Energy Equation
 - Steady Flow of Incompressible Fluids
 - Dynamic Forces
 - Introduction to Thermodynamic Properties
 - Laws of Thermodynamics and Applications
 - The Steam Cycle
 - The Mechanical Refrigeration Cycle
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Information for Students

- Expectations of Students
 - [Civility Statement](#)
 - [Student Responsibility Statement](#)
 - [Academic Integrity Statement](#)
- [Accessibility Services](#)
Students who require accommodations to complete the requirements and expectations of this course because of a disability must make their accommodation requests to the Accessibility Services Coordinator.
- [Get Help: JCC & Community Resources](#)
- [Emergency Closing Procedures](#)
- Course grade is determined by the instructor based on a combination of factors, including but not limited to, homework, quizzes, exams, projects, and participation. Final course grade can be translated into a grade point value according to the following:

A=4.0	B+=3.5	B=3	C+=2.5	C=2	D+=1.5	D=1	F=0
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- Veterans and active duty military personnel with special circumstances (e.g., upcoming deployments, drill requirements, VA appointments) are welcome and encouraged to communicate these to the instructor.
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Effective Date: Fall 2023