JAMESTOWN COMMUNITY COLLEGE
State University of New York

INSTITUTIONAL COURSE SYLLABUS

Course Title: Mechanics-Statics

Course Abbreviation and Number: ENR 2550 **Credit Hours:** 3 **Course Type:** Lecture

Course Description: Students will study rigid body mechanics including forces, force systems, their resultants, and conditions for equilibrium. Other topics include equivalent force systems, equilibrium of rigid bodies, structural mechanics to include trusses, frames and beams, shear and bending moment diagrams, friction, and properties of areas and volumes.

Prerequisite: PHY 1710; Prerequisite/Corequisite: MAT 2650.

Student Learning Outcomes:

Students who demonstrate understanding can:

1. Construct free-body diagrams and identify external forces and moments acting on them.
2. Determine the components, sums, differences, vector products, and scalar products of vectors in two and three dimensions and apply these operations to force, position, and moment vectors.
3. Determine the equivalent of a resultant force-couple system.
4. Apply the principles of equilibrium to determine forces or moments acting in or on important engineering entities such as trusses, frames and machines.
5. Apply the concepts of friction to simple problems such as sliding and tipping.
6. Determine the centroid of areas, surfaces and volumes, and determine the moment of inertia of areas.

Topics Covered:

- Review of Vectors, and Vector Notation
- Review of Force, Position and Displacement Vectors
- Equilibrium of a Concurrent Force System
- The Concept of the Moment of a Force, the Moment Vector and Couple
- Equivalent Force System
- The Concept of a Rigid Body
- Equilibrium of a 2-D Force System
- Equilibrium of a 3-D Force System
- Structural Mechanics
  - Frames
  - Trusses
  - Beams
- Properties of Areas
  - Area-volume
  - Centroid, center of gravity
  - First moment of inertia
  - Principle moment of inertia
  - Mohr's circle of inertia
- Friction
  - Basic definitions
  - Belt friction
  - Bearing friction
- Method of Virtual Work (optional)

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

- 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.

Effective Date: Fall 2021