Administrative Master Syllabus

Course Information

Course Title	Engineering Mechanics - Statics
Course Prefix, Num. and Title	ENGR 2301
Division	Math & Physical Sciences
Department	Physics & Engineering
Course Type	Academic General Education Course (from ACGM, but not WCJC Core)
Course Catalog Description	Basic theory of engineering mechanics, using calculus, involving the description of forces, moments, and couples acting on stationary engineering structures; equilibrium in two and three dimensions, free-body diagrams, friction, centroids, centers of gravity, and moments of inertia.
Pre-Requisites	PHYS 2425 with a grade of "C" or better and concurrent enrollment in or previous completion of MATH 2414
Co-Requisites	None

Semester Credit Hours

Total Semester Credit Hours (SCH): Lecture Hours: Lab/Other Hours	3:3:0
Equated Pay Hours	3
Lab/Other Hours Breakdown: Lab Hours	0
Lab/Other Hours Breakdown: Clinical Hours	0
Lab/Other Hours Breakdown: Practicum Hours	0
Other Hours Breakdown	0

Approval Signatures

Title	Signature	Date
Department Head:	*Rocio Doherty*	07/17/24
Division Chair:		7-25-2024
VPI:		

Rev. June 2023

Additional Course Information

Topical Outline: Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, and clinical or other non-lecture instruction).

1. Statics of Particles
2. Rigid Bodies: Equivalent System of Forces
3. Equilibrium of Rigid Bodies
4. Distributed Forces: Centroids and Centers of Gravity
5. Analysis of Structures Forces in Beams and Cables Friction
6. Distributed Forces: Moments of Inertia

Course Learning Outcomes:

Learning Outcomes – Upon successful completion of this course, students will:

1. State the fundamental principles used in the study of mechanics.
2. Define magnitude and directions of forces and moments and identify associated scalar and vector products.
3. Draw free body diagrams for two- and three- dimensional force systems.
4. Solve problems using the equations of static equilibrium.
5. Compute the moment of force about a specified point or line.
6. Replace a system of forces by an equivalent simplified system.
7. Analyze the forces and couples acting on a variety of objects.
8. Determine unknown forces and couples acting on objects in equilibrium.
9. Analyze simple trusses using the method of joints or the method of sections.
10. Determine the location of the centroid and the center of mass for a system of discrete particles and for objects of arbitrary shape.
11. Analyze structures with a distributed load.
12. Calculate moments of inertia for lines, areas, and volumes.
13. Apply the parallel axis theorem to compute moments of inertia for composite regions.
14. Solve problems involving equilibrium of rigid bodies subjected to a system of forces and moments that include friction.
15. Solve problems involving dry sliding friction, including problems with wedges and belts.

Methods of Assessment:

Class work, homework assignments, quizzes, and/or exams, posters/graphs/charts

Required text(s), optional text(s) and/or materials to be supplied by the student:

Russell C. Hibbeler. *Modified Mastering Engineering Revision with Pearson eText* -- Standalone Access Card -- for Engineering Mechanics: Statics & Dynamics; 15th edition, Pearson.

Students must have computer access to the WCJC website, their WCJC student email and online accounts. WCJC has open computer labs, with internet access, on all campuses for students to use.

Suggested Course Maximum:

36

List any specific or physical requirements beyond a typical classroom required to teach the course.

None

Course Requirements/Grading System: Describe any course specific requirements such as research papers or reading assignments and the generalized grading format for the course.

Coursework (homework, quizzes, etc.)	0-35%
Exam average	30-70%
Final Exam (at least 50% comprehensive)	20-30%
	100% course total

The overall course grade is assigned as specified by the college:

A = 90–100
B = 80–89
C = 70–79
D = 60–69
F = below 60

Curriculum Checklist:

☒**Administrative General Education Course** (from ACGM, but not in WCJC Core) – No additional documents needed.

☐**Administrative WCJC Core Course** – Attach the Core Curriculum Review Forms

☐Critical Thinking

☐Communication

☐Empirical & Quantitative Skills

☐Teamwork

☐Social Responsibility

☐Personal Responsibility

☐**WECM Course** – If needed, revise the Program SCANS Matrix and Competencies Checklist