



Purpose: It is the intention of this Administrative-Master Syllabus to provide a general description of the course, outline the required elements of the course and to lay the foundation for course assessment for the improvement of student learning, as specified by the faculty of Wharton County Junior College, regardless of who teaches the course, the timeframe by which it is instructed, or the instructional method by which the course is delivered. It is not intended to restrict the manner by which an individual faculty member teaches the course but to be an administrative tool to aid in the improvement of instruction.

Course Title – Engineering Mechanics - Statics

Course Prefix and Number – ENGR 2301

Department – Chemistry, Physics and Engineering

Division – Life and Physical Sciences

Course Type: (check one)

- Academic General Education Course (from ACGM – but not in WCJC Core)
- Academic WCJC Core Course
- WECM course (This course is a Special Topics or Unique Needs Course: Y or N)

Semester Credit Hours # : Lecture Hours # : Lab/Other Hours # 3:3:0

Equated Pay hours for course – 3.0

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.

List Lab/ Other Hours
Lab Hours
Clinical Hours
Practicum Hours
Other (list)

Prerequisites/Co-requisites - PHYS 2425 with a grade of “C” or better and concurrent enrollment in or previous completion of MATH 2414

Prepared by Ramiro Acevedo

Date 10-5-14

Reviewed by Department Head Ramiro Acevedo

Date 10-5-14

Accuracy Verified by Division Chair Kevin Dees

Date 10-5-14

Approved by Dean or Vice President of Instruction *gghunt*

Date 5-27-15



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

- Statics of Particles
- Rigid Bodies: Equivalent System of Forces
- Equilibrium of Rigid Bodies
- Distributed Forces: Centroids and Centers of Gravity
- Analysis of Structures
- Forces in Beams and Cables Friction
- Distributed Forces: Moments of Inertia

II. Course Learning Outcomes

Learning Outcomes	Methods of Assessment
<p>Upon successful completion of this course, students will:</p> <ol style="list-style-type: none"> 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. 	<p>Outcomes assessed by:</p> <p>Class work, homework assignments, quizzes, and/or exams, posters/graphs/charts, oral</p>

III. Required Text(s), Optional Text(s) and/or Materials to be Supplied by Student.

Beer, Johnston, Mazurek, and Cornwell, *Vector Mechanics for Engineers: Statics and Dynamics*, 10th edition, McGraw-Hill (required)

Scientific calculator (optional at Instructor's discretion)

IV. Suggested Course Maximum – 36 lecture

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

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

<u>Lecture average:</u>	Exam average (3 or 4 exams)	30–70%
	Other (homework, quizzes, projects, etc.)	0–35%
<u>Final Exam average:</u>	(includes at least 50% comprehensive material)	<u>20–30%</u>
		100% total

The overall course grade is assigned as specified by the college: A = 90–100, B = 80–89, C = 70–79, D = 60–69, and F = below 60.

VII. Curriculum Checklist

- **Academic General Education Course** (from ACGM – but not in WCJC Core)
No additional documentation needed

- **Academic WCJC Core Course**
Attach the Core Curriculum Review Forms

- Critical Thinking
- Communication
- Empirical & Quantitative Skills
- Teamwork
- Social Responsibility
- Personal Responsibility

- **WECM Courses**
If needed, revise the Program SCANS Matrix & Competencies Checklist.