



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 - Dynamics

Course Prefix and Number – ENGR 2302

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 motion of particles, rigid bodies, and systems of particles; Newton’s Laws; work and energy relationships; principles of impulse and momentum; application of kinetics and kinematics to the solution of engineering problems.

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

Prerequisites/Co-requisites – ENGR 2301 with a grade of “C” or better

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):

- Kinematics of Particles
- Kinetics of Particles: Newton’s Second Law
- Kinetics of Particles: Energy and Momentum Methods
- Systems of Particles
- Kinematics of Rigid Bodies
- Plane Motion of Rigid Bodies: Forces and Accelerations
- Plane Motion of Rigid Bodies: Energy and Momentum Methods
- Kinetics of Rigid Bodies in Three Dimensions
- Mechanical Vibrations

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. Express dynamic quantities as vectors in terms of Cartesian components, polar coordinates, and normal- tangential coordinates. 2. Compute mass moments of inertia for systems of particles and rigid bodies. 3. Solve kinematic problems involving rectilinear and curvilinear motion of particles. 4. Solve kinetic problems involving a system of particles using Newton's Second Law. 5. Apply the principles of work and energy, conservation of energy, impulse and momentum, and conservation of momentum to the solution of engineering problems involving particles and systems of particles. 6. Solve kinematic problems involving the translation and rotation of a rigid body. 7. Solve kinetic problems involving planar translation and rotation of rigid bodies. 8. Apply the principles of work and energy, conservation of energy, impulse and momentum, and conservation of momentum to the solution of engineering problems involving rigid bodies in planar motion 	<p>Outcomes assess 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.