PALOMAR COLLEGE
COURSE OUTLINE OF RECORD FOR
DEGREE CREDIT COURSE

_X_ Transfer Course _X_ A.A. Degree applicable course
(check all that apply)

COURSE NUMBER AND TITLE: ENGR 236 – Engineering Mechanics-Dynamics

UNIT VALUE: 3

MINIMUM NUMBER OF SEMESTER HOURS: 48

BASIC SKILLS REQUIREMENTS: Appropriate language and computational skills.

ENTRANCE REQUIREMENTS

PREREQUISITE: ENGR 235

COREQUISITE: None

RECOMMENDED PREPARATION: None

SCOPE OF COURSE:
Fundamental principles of bodies in motion; kinetics and kinematics of particles; system of particles; central force; work and energy; linear and angular momentum; moments and products of inertia; vibrations and time response; engineering applications.

SPECIFIC COURSE OBJECTIVES:
The successful student will be able to:
1. Apply the principles and theory of Dynamics to problems and situations that will be encountered in advanced engineering courses as well as the work place.
2. Correctly solve problems and present the solutions in a concise, precise, and understandable manner.
3. Fabricate simple mechanical models to demonstrate certain, key, theoretical concepts related to the fundamental principles of Dynamics.

CONTENT IN TERMS OF SPECIFIC BODY OF KNOWLEDGE:
1. Kinematics of Particles
   a. Rectilinear motion of particles
   b. Uniformly accelerated motion
   c. Graphical solutions of rectilinear motion
   d. Curvilinear motion of particles
   e. Motion relative to a frame in transition

2. Kinetics of Particles: Newton's Second Law
   a. Equations of motion
   b. Angular Momentum
   c. Central Forces
3. Kinetics of Particles: Energy and Momentum Methods
   a. Work of a force
   b. Kinetic Energy of a particle
   c. Principle of work and energy
   d. Potential energy
   e. Conservative forces
   f. Motion under a conservative central force
   g. Principle of impulse and momentum
   h. Direct central impact
   i. Direct oblique impact
4. Systems of Particles
   a. Applying Newton's Law to a system of particles
   b. Linear momentum of a system of particles
   c. Angular momentum of a system of particles
   d. Conservation of momentum for a system of particles
   e. Kinetic energy for a system of particles
   f. Work-energy principle for a system of particles
   g. Impulse-momentum principle for a system of particles.
5. Kinematics of Rigid Bodies
   a. Translation
   b. Rotation about a fixed axis
   c. General plane motion
   d. Absolute and relative velocity in plane motion
   e. Instantaneous center of rotation in plane motion
   f. Plane motion of a particle relative to a rotating frame of reference.
6. Plane Motion of Rigid Bodies: Forces and Acceleration
   a. Equations of motion for a rigid body
   b. Angular momentum of a rigid body in plane motion
   c. Plane motion of rigid body
   d. Systems of rigid bodies
7. Plane Motion of Rigid Bodies: Energy and Momentum Methods
   a. Principle of work and energy for a rigid body
   b. Kinetic energy of a rigid body in plane motion
   c. Conservation of energy
   d. Principle of impulse and momentum for the plane motion in a rigid body
   e. Conservation of angular momentum
   f. Impulsive motion
8. Mechanical Vibration
   a. Vibrations of particles and equations of motion
   b. Vibrations of rigid bodies and equations of motion
   c. Energy methods
   d. Forced vibrations
   e. Damped vibrations

REQUIRED READING:
Beer, Ferdinand P. and E. Russell Johnston, Jr. Vector Mechanics for Engineers: Dynamics. 6th edition.

New York: McGraw-Hill, 1997.

SUGGESTED READING: None

REQUIRED WRITING:
For all written assignments, including tests, quizzes, homework, and class projects, the student is required to submit work that is consistent with reporting engineering work and results in the work place. This requirement includes identification of the problem, listing of relevant data and factors, description of solution selected, computations and solution of problem, and results and conclusions.

OUTSIDE ASSIGNMENTS:
Students are expected to spend a minimum of three hours per unit per week in class and on outside assignments, prorated for short-term classes.

Student will solve assigned problems and hand in for grading. Student will be assigned a class project wherein he/she will demonstrate a proficiency and in-depth understanding of a specific, key, theoretical concept presented in the lectures through simple demonstrations.

INSTRUCTIONAL METHODOLOGY:

Check all that apply:
_X_ lecture
_____ laboratory
_____ lecture-laboratory combination
_____ directed study

DISTANCE LEARNING:

This course may be offered as a distance learning course and meets Title 5 regulations 55370, 55372, 55374, 55376, 55378, and 55380.
Yes ____ No_X__

If yes, check all that apply:

_____ Television Course (Video one-way, e.g. ITV, video cassette, etc.)
_____ Online Course (Text one-way, e.g. newspaper, correspondence, electronic file, etc.)
_____ Two-Way Video Conferencing (Two-way interactive video and audio)
_____ One-Way Video Conferencing (One-way interactive video and two-way interactive audio)
_____ Computer Assisted Instruction (A specialized form of mediated instruction relying primarily on student access to information and prepared lessons or teaching materials through a computer terminal, but not under immediate supervision of a qualified instructor.)

GRADING POLICY AND STANDARDS (include methods of determining whether the stated objectives have been met by students):

Grades are determined by scores received on exams and other projects according to the following plan:

Homework	0 - 10%
Class projects	10 - 20%
Quizzes	0 - 20%
Exams	30 – 50%
Final	30 - 50%

IS COURSE REPEATABLE FOR REASON(S) OTHER THAN DEFICIENT GRADE?
Yes ____ No X Number of times course may be taken for credit: 1

If yes, identify specific provision of Title 5 Division 2 section(s), 55761-55763 and 58161 which qualifies course as repeatable:

CONTACT PERSON: Martin Mason

SIGNATURES:

SIGNATURES ON FILE