ENGINEERING DYNAMICS – EGR K212
Fall 2010 Syllabus
Room D122, Wednesday, 6:00 – 8:45 pm

Instructor: Prof. Wanda Short
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Telephone: (860) 885.2349 office
Office Hours: 3:30 – 5:00 pm Mondays & Wednesdays; Alternate Days/Times by Appointment

Course Description:

EGR* K212; 3 CREDIT HOURS; ENGINEERING DYNAMICS

Prerequisites: EGR K211 Engineering Statics and MAT* K256* Calculus II

Engineering applications of Newtonian mechanics to dynamic forces, translational motion, work, impulse and momentum will be taught. Topics include: kinematics, kinetics of particles and rigid bodies, vibrations, energy and momentum conservation.

Text Book:

Hibbeler, R. C., Engineering Mechanics - Dynamics, 12th Edition, Published by Pearson/Prentice Hall, 2010; ISBN 9780136077916

Course Objectives:

After completing this course, students should be able to:

1. Kinematics of a Particle
   - Introduce the concepts of position, displacement, velocity and acceleration.
   - Study particle motion along a straight line and represent this motion graphically.
   - Investigate particle motion along a curved path using different coordinate systems
   - Present an analysis of dependent motion of two particles.
   - Examine the principles of relative motion of two particles using translating axes.
2. Kinetics of a Particle: Force and Acceleration
   - State Newton's Second Law of Motion and to define mass and weight.
   - Analyze the accelerated motion of a particle using the equation of motion with different coordinate systems.
   - Investigate central-force motion and apply it to problems in space mechanics.
3. Kinetics of a Particle: Work and Energy
   - Develop the principle of work and energy and apply it to solve problems that involve force, velocity and displacement.
   - Study problems that involve power and efficiency.
   - Introduce the concept of a conservative force and apply the theorem of conservation of energy to solve kinetic problems.
4. Kinetics of a Particle: Impulse and Momentum
   - Develop the principle of linear impulse and momentum for a particle and apply it to solve problems that involve force, velocity, and time.
   - Study the conservation of linear momentum for particles.
   - Analyze the mechanics of impact.
   - Introduce the concept of angular impulse and momentum.

5. Planar Kinematics of a Rigid Body
    - Classify the various types of rigid-body planar motion.
    - Investigate rigid-body translation and angular motion about a fixed axis.
    - Study planar motion using an absolute motion analysis.
    - Provide a relative motion analysis of velocity and acceleration using a translating frame of reference.
    - Show how to find the instantaneous center of zero velocity and determine the velocity of a point on a body using this method.
6. Planar Kinetics of a Rigid Body: Force and Acceleration
    - Introduce the methods used to determine the mass moment of inertia of a body.
    - Develop the planar kinetic equations of motion for a symmetric rigid body.
    - Discuss applications of these equations to bodies undergoing translation, rotation about a fixed axis and general plane motion.
7. Vibrations
    - Discuss undamped one-degree-of-freedom vibration of a rigid body using the equation of motion and energy methods.
    - Study the analysis of undamped forced vibration and viscous damped forced vibration.

Instructor Assistance:
Seeking help from the instructor outside of class is encouraged if you are having difficulty understanding course material.

Homework:
Homework is graded and is due on the assigned date at the beginning of class. Homework received up to one week late will cover alternate problems and will be reduced by a factor of 5% for each school day the assigned homework is late.

If you cannot attend a lecture due to extraordinary events, notify the instructor in advance of the meeting you will miss. Unless special arrangements have been made with the instructor in advance, the due date for written work will not change. You are responsible for obtaining the information covered at any meeting you miss.

Makeup Policy: Quizzes will be made up only if the makeup is arranged before the scheduled quiz period, and only in the case of an excused emergency.

Academic Integrity:
Academic integrity is essential to a useful education. Failure to act with academic integrity severely limits a person's ability to success in the classroom and beyond. Furthermore, academic dishonesty erodes the legitimacy of every degree awarded by the College. In this class and in the course of your academic career, present only your own best work; clearly document the sources of the material you use from others; and act at all times with honor.

Grading Policy:
Weekly homework, quizzes, a mid-term and a comprehensive final exam will be given during the semester along with a grade assigned for class participation. The dates of the exams are noted in the Lecture Schedule. Tests that are missed for any reason cannot be made up unless **prior** arrangements are made with the instructor.

Final grades will be based on the following weighting:

40%	Homework & Quizzes Average
10%	Class Participation Average
20%	Mid Term
30%	Final Exam
100%	Total

Attendance:
This course is designed in such a way that a student should get more from the in-class activities than from the textbook alone. Therefore, students who are registered for this course are naturally expected to attend class regularly. Over the span of a semester the instructor expects to become familiar with the attendance habits of individual students. Therefore, these habits cannot help but be a factor in the evaluation of class participation and student contribution.

Withdrawal:
A student who finds it necessary to discontinue a course must complete a "Withdrawal Request Form" available in the Registrar's office within the time limits of the semester calendar. Students who do not withdraw, but stop attending will be assigned an "F" signifying a failing grade.

Disabilities Statement:
If you are a student with a disability and believe you will need accommodations for this class, you must contact the Disabilities Counseling Services at (860) 823-2830. To avoid any delay in the receipt of accommodations, you should contact the counselor as soon as possible. The instructor cannot provide accommodations until an accommodation letter from the Disabilities Counselor is received.

Three Rivers
COMMUNITY COLLEGE

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Date	Class #	Event	Topic	Read Chapter Prior to Class
Sep 1	1		Kinematics of Particles	12.1 – 12.3
Sep 8	2		Kinematics of Particles	12.4 – 12.6
Sep 15	3	**Quiz 1**	Kinematics of Particles	12.7 – 12.9
Sep 22	4		Kinetics of Particles	13.1 – 13.3
Sep 29	5		Kinetics of Particles	13.4 – 13.5
Oct 6	6	**Quiz 2**	Kinetics of Particles – Energy Methods	14.1 – 14.4
Oct 13	7		Kinetics of Particles – Energy & Momentum Methods	14.5 – 14.6 15.1 – 15.2
Oct 20	8	**Exam**	**Mid-Term Exam**	
			Kinetics of Particles –Momentum & Impact	15.3 – 15.4
Oct 27	9		Kinematics of Rigid Bodies	16.1 – 16.3
Nov 3	10	**Quiz 3**	Kinematics of Rigid Bodies	16.4 – 16.5
Nov 10	11		Kinematics of Rigid Bodies	16.6 – 16.7
Nov 17	12	**Quiz 4**	Planar Kinetics of a Rigid Body – Force &Acceleration	17.1 – 17.3
Nov 24			**Supplemental Review/Make-up**	
Dec 1	13		Planar Kinetics of a Rigid Body – Force &Acceleration	17.4 – 17.5
Dec 8	14		Introduction to Vibrations	22.1 – 22.2
Dec 15	15	**Exam**	**Final Exam**	