Three Rivers COMMUNITY COLLEGE

ENGINEERING DYNAMICS – EGR K212
Fall 2012 Syllabus
Room E218, Wednesday, 6:00 – 8:45 pm

Instructor: Prof. Wanda Short
Office: C128
Email: **Blackboard Learn Messaging (preferred)**
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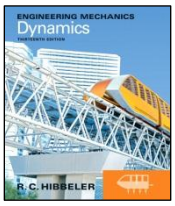
Telephone: (860) 885-2349 office
Office Hours: Mondays/Wednesdays 1:30 – 3:00 p.m.; Other Dates/Times by Appointment

Required Textbook:



Hibbeler, R. C., Engineering Mechanics - Dynamics, 13th Edition, Pearson/Prentice Hall Publishers, 2013, ISBN-10: 0132911272, ISBN-13: 9780132911276

Course Description:

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. *Prerequisites: EGR* K211 and MAT* K256.*

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.

Lecture Course Evaluation:

Course evaluation will be based on weekly assignments, quizzes, class participation/attendance and final project. The final grade for this course will be determined by the following percentages:

40%	Average of Homework & Quizzes
20%	Mid-Term Exam
30%	Final Exam
5%	Course Work Portfolio
5%	In-Class Participation
100%	Total

Exams/Quizzes: A mid-term and a final exam along with 4 quizzes will be administered. Each exam and quiz will cover material from the text, lectures, homework, in-class group problems and example problems. Exams and/or quizzes that are missed for any reason cannot be made up unless prior arrangements are made with the instructor.

Homework: Homework should be submitted on or before the due date. Late homework will not be accepted unless arrangements were made with instructor prior to the due date (no exceptions) which may result in an alternate assignment. 10% will be deducted per week for assignment submitted late. Assignments beyond two weeks late will not be accepted. Assignments will be graded on professionalism, accuracy, style and completeness. The details for each assignment, including work to be completed and the due date will be posted in Blackboard Learn and distributed in class prior to each major section. All assignments are due at the beginning of class on the dates indicated.

Course Work Portfolio: The course work portfolio is a collection of copies of all work performed in the class. The portfolio should be broken into the following sections: (1) homework, (2) quizzes/exams, and (3) lab reports. The portfolio should be contained in a binder or folder. Grading will be based on completeness & organization.

In-Class Participation: Each student is expected to attend every class. This course is designed in such a way that a student should get more from the in-class activities than from the textbook alone. If you miss a class, you are responsible for obtaining notes, handouts and assignments. Course material including syllabus, course content, lectures, notes and is located in Blackboard Learn. As noted in the course evaluation, a 5% grade weight is assigned to course participation and attendance. Attendance will be taken at each class meeting. If you cannot attend a lecture due to extraordinary events, notify the instructor in advance of the class you will miss. Unless special arrangements have been made with the instructor in advance, the due date for assignments and quizzes will not change.

Grading Policy:

Grades will be assigned according to the following scale:

94 -100	A
90 - 93	A -
87 - 89	B +
83 - 86	B
80 - 82	B -
77 - 79	C +
73 - 76	C
70 - 72	C -
67 - 69	D +
63 - 66	D
60 - 62	D -
Below 60	F

Classroom Policies: Use of **cell phones**, pagers, texting, surfing the Internet or playing computer games **are Not Permitted** during class! Language and behavior that is disrespectful, or disruptive, to others is unacceptable. Students should refer to their Student Handbook for examples of such behavior as well as additional school policies.

Instructor Assistance: Seeking help from the instructor outside of class is encouraged if you are having difficulty understanding course material. You are encouraged to seek assistance during class as well as during office hours and other times by appointment.

Course Withdrawal: A student who simply stops submitting work will receive the grade earned on work submitted, usually a failing grade. To receive a "W" grade you must apply for a withdrawal through the Registrar's office within the time limits of the semester calendar. A "W" will be entered on the student transcript but will not be included in the calculation of the GPA.

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.

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.

Engineering Dynamics (EGR 212) Course Outline (*1)					
Date (*2)	**Lecture #**	**Event**	**Course Topic**	**Reading Assignments**	**Homework Due Dates** (*3)
8/29	1		**Chap 12: Kinematics of Particles** Rectilinear Kinematics: Continuous & Erratic Motion	12.1 – 12.3	
9/5	2		General Curvilinear Motion, Curvilinear Motion: Rectangular Components, Motion of a Projectile	12.4 – 12.6	HW #1
9/12	3		Curvilinear of Motion: Normal, & Cylindrical Tangential Components, Absolute Dependent Motion Analysis of Two Particles	12.7 – 12.9	HW #2
9/19	4	**Quiz 1** covering 12.1–12.6	**Chap 13: Kinetics of Particles** Newton's Second Law of Motion, The Equations of Motion Equation of Motion for a System of Particles	13.1 – 13.3	HW #3
9/26	5		Equations of Motion: Rectangular, Normal, Tangential and Cylindrical Coordinates	13.4 – 13.6	HW #4
10/3	6	**Quiz 2** covering 12.7–12.9 13.1–13.3	**Chap 14: Kinetics of a Particle: Work and Energy** The Work of a Force, Principle of Work and Energy for a System of Particles, Power and Efficiency	14.1 – 14.4	HW #5
10/10	7		Conservative Forces and Potential Energy, Conservation of Energy **Chap 15: Kinetics of a Particle: Impulse and Momentum** Principle of Linear Impulse and Momentum, Conservation of Linear Momentum for a System of Particles	14.5 – 14.6 15.1 – 15.3	HW #6
10/17	8	**Exam**	**Mid-Term Exam** **Covering Chapters 12 & 13**		
10/24	9		Impact **Chap 16: Planar Kinematics of a Rigid Body** Planar Rigid-Body Motion, Translation, Rotation about a Fixed Axis	15.4 16.1 – 16.3	HW #7
10/31	10		Absolute Motion Analysis, Relative-Motion Analysis: Velocity	16.4 – 16.5	HW #8
11/7	11	**Quiz 3** covering 14.1–14.6 15.1–15.4	Instantaneous Center of Zero Velocity Relative-Motion Analysis: Acceleration	16.6 – 16.7	HW #9
11/14	12		**Chap 17: Planar Kinetics of a Rigid Body: Force &Acceleration** Mass Moment of Inertia, Planar Kinetic Equations of Motion, Equations of Motion: Translation	17.1 – 17.3	HW #10
11/21			**College Open - Class Not In Session**		
11/28	13	**Quiz 4** covering 16.1–16.7	Equations of Motion: Rotation about a Fixed Axis, General Plane Motion	17.4 – 17.5	HW #11
12/5	14		**Chap 22: Vibrations** Undamped Free Vibration, Energy Methods	22.1 – 22.2	In-Class Problems
12/12	15	**Exam**	**Final Exam** **Covering Chapters 14 - 17**		

Notes: 1) This course schedule is subject to change as conditions warrant
2) Please note the following: Tue 11/20 (Supplemental Class) and Thu 11/22 (Thanksgiving Day)
3) Detail outline of all homework will be distributed in-class and is also available on Blackboard Learn

as of 9/5/2012