

**EGR 242**  
**Engineering Mechanics II: Dynamics**  
**Summer 2019 – Session II**

**Course Description:** The basic objective of this course is to acquaint students with the fundamental principles of kinematics and kinetics. The main principles are introduced by analyzing objects as particles. Later on the concepts are applied by treating objects as rigid bodies. Concepts discussed in detail include acceleration, impulse – momentum, and work – energy.

**Topics:**

1. Rectilinear and Curvilinear Motions of Particles
2. Cartesian, Normal - Tangential, and Radial - Transverse Components
3. Equations of Motion, Newton's 2<sup>nd</sup> Law
4. Work-Energy and Impulse–Momentum Principles
5. Dynamic Equilibrium, Linear and Angular Momentum
6. Systems of Particles
7. Kinematics of Rigid Bodies: Velocity and Acceleration
8. Translation and Rotation about Fixed Axes

**Course learning objectives:**

The basic objective of the course is to acquaint students with the fundamental principles of kinematics and kinetics. Objects are treated as particles as well as rigid bodies. Concepts of force, mass, acceleration, impulse - momentum, and work - energy principles are discussed in detail to analyze problems of motion.

**Student learning outcomes:**

- ✓ Analyze and solve kinematic particle problems for acceleration, velocity and position.
- ✓ Analyze and solve kinetic particle problems using Newton's 2nd Law.
- ✓ Analyze and solve motion of particle problems using energy and momentum methods.
- ✓ Analyze and solve system of particle problems.
- ✓ Analyze and solve kinematic rigid body problems for acceleration, velocity and position.
- ✓ Analyze and solve kinetic rigid body problems for motion in a plane.
- ✓ Analyze and solve motion of rigid body problems using energy and momentum methods.

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**Office Hours:** TWTh from 12 – 1 pm, or by appointment

**Class Meeting:** TWTh, from 1 pm – 4 pm at SENG 113

**Text Book:** Engineering Mechanics – Dynamics (14<sup>th</sup> edition), R.C. Hibbeler, Pearson

### **Prerequisites**

EGR 241 (Statics), MTH 152 or 154 (Calculus II)

### **Chapters covered from the above textbook**

Chapter-12, Chapter-13, Chapter-14, Chapter-15, Chapter-16, Chapter-17.

### **Course Grading Policy:**

HW assignments	30%
Midterm Exam	30%
Final Exam	40%

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**Semester Total      100%**

### **Note**

If due to a medical emergency or any other legitimate reason, a student is not able to hand in a homework assignment by the due date or take an exam, the course instructor should be informed before class and will be contacted again as soon as possible to make up the missed work.

### **Course Policy:**

1. Students are required to regularly study the material discussed in class and solve all homework problems. They should maintain a neat file of all problems to assimilate the subject matter and prepare for their exams. It is the responsibility of each student to make sure that he/she knows how to correctly solve all the assigned problems including those discussed in class.
2. You should regularly study the material discussed in class and solve all homework problems. You may work together, but must submit your own homework assignment by the due date. Homeworks will be uploaded on myCourses in the "Assignments" section. Late Homework will NOT be accepted.
3. Please turn in all assignments on time. What constitutes "on time"? Assignments should reach me, in person, within the first 5 minutes of the class meeting on the assignment's due date.
4. Any form of academic dishonesty in exams and/or homework will result in the issuance of an F grade for the course and possibly other departmental action. See Student Handbook and/or UMD General Catalogue for definition of academic dishonesty. The UMD policy on academic integrity can be found at <http://www.umassd.edu/policies/activepolicylist/academicaffairs/academicintegritypolicyandreportingform/>.

5. Class attendance will be taken. Attendance will not count toward your final grade; however, students who skip lectures seldom do well on their examinations.
6. Please check MyCourses regularly for updated postings. Homework assignments, solutions, handouts, grades, and other course materials will be added to the course's site throughout the semester.
7. The Center for Access and Success provides many services for students with disabilities. See <http://www.umassd.edu/dss/services.cfm>  
Center for Access and Success  
Pine Dale Hall, Room 130  
Phone: 508-999-8711
8. According to the university catalogue, an incomplete grade may be given only in exceptional circumstances. The complete policy can be found at [http://catalog.umassd.edu/content.php?catoid=1&navoid=37#Grades\\_and\\_Grading\\_System](http://catalog.umassd.edu/content.php?catoid=1&navoid=37#Grades_and_Grading_System)
9. For electronic communication, I will send emails to your university email address. University policy specifies that students are responsible for all official correspondence sent to their standard UMD email address (@umassd.edu).
10. **NOT CHECKING UMD EMAIL OR MYCOURSES NOTICES IS NOT AN EXCUSE FOR "I WAS NOT INFORMED".**

### **Classroom Policies**

Every student is expected to respect the following rules.

- No cell phones should be used during lectures. They must be put on silence.
- No laptops or any other electronic device should be used during lectures unless otherwise instructed.
- If a student needs to eat/drink during lectures, this should be done without distracting others.
- Every student should be seated within 5 minutes after class starts.
- If a student has a question during lecture, it should be asked from the instructor and not be discussed with a classmate while the instructor is teaching.

### **Email Requests**

When sending an email, please specify the course name in the subject area.

**EGR 242 (Summer 2019) Course Schedule:** (Subject to change with advance notice)

<b>Day</b>	<b>Date</b>	<b>Chapter from textbook</b>	<b>HW / Quiz</b>
Tu	Jul 16	<ul style="list-style-type: none"> <li>✓ Introduction and Syllabus Discussion</li> <li>✓ 12.1-12.5 (Kinematics of a Particle)</li> </ul>	HW 1 Assigned
We	Jul 17	<ul style="list-style-type: none"> <li>✓ 12.6-12.9 (Kinematics of a Particle)</li> <li>✓ 13.1-13.4 (Kinematics of a Particle: Force and Acceleration)</li> </ul>	
Th	Jul 18	<ul style="list-style-type: none"> <li>✓ 13.5-13.6 (Kinematics of a Particle: Force and Acceleration)</li> <li>✓ 14.1-14.4 (Kinematics of a Particle: Work and Energy)</li> </ul>	
Tu	Jul 23	<ul style="list-style-type: none"> <li>✓ 14.5-14.6 (Kinematics of a Particle: Work and Energy)</li> <li>✓ 15.1-15.4 (Kinematics of a Particle: Impulse and Momentum)</li> </ul>	HW 1 Due, HW 2 Assigned
We	Jul 24	<ul style="list-style-type: none"> <li>✓ 15.5-15.7 (Kinematics of a Particle: Impulse and Momentum)</li> <li>✓ 16.1-16.4 (Planar Kinematics of a Rigid Body)</li> </ul>	
Th	Jul 25	<ul style="list-style-type: none"> <li>✓ 16.5-16.7 (Planar Kinematics of a Rigid Body)</li> <li>✓ <i>Review for Midterm Exam</i></li> </ul>	
Tu	Jul 30	<ul style="list-style-type: none"> <li>✓ <b>Midterm Exam</b></li> <li>✓ 17.1-17.3 (Planar Kinematics of a Rigid Body: Force and Acceleration)</li> </ul>	HW 2 Due, HW 3 Assigned
We	Jul 31	<ul style="list-style-type: none"> <li>✓ 17.4-17.5 (Planar Kinematics of a Rigid Body: Force and Acceleration)</li> <li>✓ 18.1-18.2 (Planar Kinematics of a Rigid Body: Work and Energy)</li> </ul>	
Th	Aug 01	<ul style="list-style-type: none"> <li>✓ 18.3-18.5 (Planar Kinematics of a Rigid Body: Work and Energy)</li> </ul>	
Tu	Aug 06	<ul style="list-style-type: none"> <li>✓ 19.1 (Planar Kinematics of a Rigid Body: Impulse and Momentum)</li> </ul>	HW 3 Due, HW 4 Assigned
We	Aug 07	<ul style="list-style-type: none"> <li>✓ 19.2 (Planar Kinematics of a Rigid Body: Impulse and Momentum)</li> </ul>	
Th	Aug 08	<ul style="list-style-type: none"> <li>✓ 19.3 (Planar Kinematics of a Rigid Body: Impulse and Momentum)</li> </ul>	
Tu	Aug 13	<ul style="list-style-type: none"> <li>✓ <i>Review of the course</i></li> </ul>	HW 4 Due
We	Aug 14	<b>FINAL EXAM</b>	

*As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. –Sheikh F Ferdous*