ENGR& 215 Dynamics

COURSE DESCRIPTION:
Studies of motion using vector calculus, central force motion, Newtonian mechanics, energy, and impulse momentum methods.

PREREQUISITE:
ENGR& 214 and MATH 221 each with a grade of 2.0 or higher; or ENGR& 214 with a grade of 2.0 or higher and co-enrollment in MATH 221; or instructor permission.

SPECIAL MATERIALS:
A graphing calculator is required. Calculators may be used on all exams.

GENERAL OBJECTIVES:
Upon successful completion of this course you will be able to:
1. Predict the motion of a system of particles using: Vector calculus, Newton’s Laws, concepts of velocity and acceleration, rectilinear motion and curvilinear motion.
2. Predict the motion of systems of particles and rigid bodies: Plane motion, moving coordinates, general motion.
3. Incorporate the knowledge of system motion into the design process to insure that the system meets the criteria for motion inherent in the problem statement.
4. Predict motion of a system of particles using the method of conservation of momentum including: linear momentum, angular momentum and impulse and momentum concepts.
5. Predict motion of a system of particles using the methods of conservation of energy including: potential and kinetic energy and work.
6. Develop and utilize team skills necessary in the solution of engineering problems.
7. Report the results of your analyses clearly, concisely, and in required format.

COURSE REQUIREMENTS:

Assignments:
1. We cover chapters 12 through 19 in the text. Read the text before class. Bring your text and calculator to every class.
2. Assignments will be given for each section. These represent a minimum. If you are having trouble, do more problems!
3. Assignments are due the day indicated on the assignment sheet.
4. Come prepared to solve problems and ask questions each class day.

INCLEMENT WEATHER:
I will use my voice mail message to indicate whether there will be class on any days where normal life is disrupted. I will post a message by 7 a.m. if possible. I will also post course revisions to the web site as soon as possible.
POLICIES:

Engineering, like physics and mathematics, is a contact sport. To excel, you must get personally involved with the material and you must be assertive in seeking help during the rough spots. It is always tempting to give up when the going gets tough. Please know that I will do all I can to help you through rough spots!

1. **Homework:** *There will be a homework assignment nearly every week.* We are using the online homework system called Mastering Engineering; a companion to the textbook. To access the homework, go to [www.masteringengineering.com](http://www.masteringengineering.com) and follow the directions to signup. There are 10 assignments; each is due by midnight on the date specified in the course calendar. You will have five chances to get the correct solution to each problem. The system will give you instantaneous feedback and suggest tutorials for further learning. The system will grade ALL of the assigned problems and that grade will factor into your course grade (see below).

2. **Portfolio:** Engineering is not so much about solving online problems as it is solving the problem AND DOCUMENTING the solution. To that end you are to work each end of section homework problem on paper, using the style sheet and the 6-step method taught in class PRIOR to submitting the answer to Mastering Engineering. You are to keep these problems in a 3-ring binder as a portfolio. You will turn in your portfolio at each exam, including the final, for evaluation. Dr. Brown will assess your portfolio any time you request during the quarter.

3. **Project:** There will be one team design project.

4. **Quizzes:** There will be a quiz most weeks (beginning week 1; see schedule for specific days) on material covered the previous week. Each quiz will require you to work one problem similar to the homework assignment based upon that material and and will be done in class.

5. **Tests:** There will be 2 exams covering certain chapters in the text. There will be a comprehensive final exam. *All exams are closed book, closed notes and will be given in class.* You may use one 8.5” X 11” sheet with notes on both sides for each in-class exam, including the final; no worked problem solutions are allowed on the note sheet; you will turn in the sheet with your exam.

6. **No make-up work:** In general, late work is not accepted. I am aware that life happens and occasionally you will miss a class, assignment or exam. Late work will be accepted on an emergency basis only. Falling behind because you are overloaded or have misplaced your priorities does not constitute an emergency. To be eligible to make up any missed work, you must talk to me in advance of the due date, or you must leave a message on my voice mail, stating the reason for your absence, prior to start of class on the day you are absent.

7. **Behavior:** It is expected that the focus of your classroom participation is learning engineering. Behavior that is disruptive to the learning process will be referred to the student conduct code as appropriate. You are expected to adhere to the National Society of Professional Engineers Code of Ethics for Engineers (cf., page 5) in all aspects regarding your participation in this class, as you will be required to do throughout your engineering career. Lastly, you are to conduct yourself as a professional in all dealings with your instructor and classmates as discussed on page 6.

8. **Office Hours:** I will keep posted office hours to the extent possible. I will make every effort to inform you of variations in office hours. You will need to make an appointment to meet with me outside of office hours. However, if the office door is open, feel free to knock and ask your questions.

continued, next page
POLICIES, continued:

9. **Grading:** grades are weighted based upon:
   - 2 Chapter Exams (15% each) 30%
   - Comprehensive Final Exam 25%
   - Graded Homework 15%
   - Portfolio 5%
   - Quizzes 10%
   - Project 15%
   - 100%

10. **Final Grade:** I grade based upon:

<table>
<thead>
<tr>
<th>Grade Range</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
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<tbody>
<tr>
<td>95-100%</td>
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<td>93-94%</td>
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<tr>
<td>92-93%</td>
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<tr>
<td>90-92%</td>
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<tr>
<td>88-90%</td>
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<td>87-88%</td>
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I do not grade based upon a curve of any type. I do not assign a WF or WP grade unless you come talk to me. If you vanish you will receive a grade of 0.0.

11. **Cheating:** You are expected to do your own work. Cheating on any part of the course will result in a grade of 0.0 for the course. You are encouraged to work in study groups on daily homework and projects, however, be careful that you learn the material: you must take the exams alone!

GETTING HELP:
Many resources are available to help you:

1. **Your text** -- it doesn’t read like a novel; you are expected to read each section BEFORE class. You must work the examples on paper, attempt the homework, reread and think about the material as necessary.
2. **Your instructor** -- see me during office hours or by appointment. I am more than willing to talk things out with you.
3. **Your friends** -- working problems through with others is an excellent learning tool (just remember not to try it on exams!).
4. **Attend class** -- take notes, participate in discussions: you generally get out of a class like this what you put in.
5. **Don’t fall behind** -- make it a priority to get your assignments completed on time.
6. **Tutors in ST 136 Saturdays, Sundays and holidays.**
7. **If you are a student with a permanent or temporary disability and would like to request accommodations, please contact the Access Services Office located in HSS 204, or call 475-7540.**
Portfolio Requirements and Grading

You are to keep your homework in a three-ring binder. Present assignments IN ORDER first to last in the portfolio (i.e. Assn 1, Assn 2 ...); use NO staples.

If you have questions on why solutions are done the way they are please see Dr. Brown.

In addition to homework, at the final, your portfolio must have a current resume and at least one example of projects you have done in this class as well as other classes. You should keep your portfolio complete so that you may take it with you to job interviews to show samples of the work you have done. You will receive extra credit for examples of projects you have done in other classes (provided they are included in the portfolio).

You may ask Dr. Brown to assess your portfolio at any time during the quarter and as often as you want. Assessment is different than evaluation. Assessment not done for a grade: it is done as a coaching tool—during assessment you will be shown strengths and areas for improvement in your portfolio.

Evaluation of your portfolio will be done for a grade. Dr. Brown will evaluate your portfolio for a grade at each exam including the final. The evaluation will be based upon the following criteria:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Number of Points</th>
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</thead>
<tbody>
<tr>
<td>Resume</td>
<td>10</td>
</tr>
<tr>
<td>Homework</td>
<td>80*</td>
</tr>
<tr>
<td>One sample of project work</td>
<td>10</td>
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<tr>
<td>Total</td>
<td>100</td>
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* you will lose 1 point for each missing assignment.

The portfolio must contain all of your homework assignments.
National Society of Professional Engineers (NSPE) Code of Ethics for Engineers

Preamble

Engineering is an important and learned profession. As members of this profession, engineers are expected to exhibit the highest standards of honesty and integrity. Engineering has a direct and vital impact on the quality of life for all people. Accordingly, the services provided by engineers require honesty, impartiality, fairness and equity, and must be dedicated to the protection of the public health, safety and welfare. Engineers must perform under a standard of professional behavior which requires adherence to the highest principles of ethical conduct.

I. Fundamental Canons

Engineers, in the fulfillment of their professional duties, shall:

1. Hold paramount the safety, health and welfare of the public.
2. Perform services only in areas of their competence.
3. Issue public statements only in an objective and truthful manner.
4. Act for each employer or client as faithful agents or trustees.
5. Avoid deceptive acts.
6. Conduct themselves honorably, responsibly, ethically and lawfully so as to enhance the honor, reputation and usefulness of the profession.

ENGINEER'S CREED

As a Professional Engineer, I dedicate my professional knowledge and skill to the advancement and the betterment of human welfare.

I pledge . . .

• To give the utmost performance;
• To participate in none but honest enterprise;
• To live and work according to the laws of man and the highest standards of professional conduct;
• To place service before profit, the honor and standing of the profession before personal advantage, and the public welfare above all other considerations.
• In humility and with the need for Divine Guidance, I make this pledge.

For further information visit the NSPE web site: http://www.nspe.org
Rights and Responsibilities of Professional Conduct

Professional conduct is the expectation for this class. This entitles each of you to certain rights and binds each of you to certain responsibilities. These include (but are not limited to):

1. The right to be treated with respect (professional employees are worthy of respect for no other reason than their status as a professional), and the responsibility to treat others with respect no matter who they are and how you feel about them.

2. The right to be rewarded for exemplary performance, and the responsibility to perform to the utmost of your capabilities.

3. The right to expect that class will begin and end on schedule and will be worth your time, and the responsibility to arrive on time and participate to the best of your ability.

4. The right to timely feedback on your performance, and the responsibility to meet all deadlines to the best of your abilities.

5. The right to know if the instructor will be absent, and the responsibility to inform the instructor of your absence in a timely fashion.

6. The right to a clean and orderly work environment, and the responsibility to do your best to keep the work environment clean and orderly.

Gender, race, age and other discrimination or harassment is against the law and is not tolerated in the work place or in this class (remember the legal definition of discrimination or harassment starts with what the other person believes—if it makes them uncomfortable then it is wrong and possibly illegal—it simply is not relevant what you intend).

Every one has bad days when their treatment of others falls short of desired intent. The legal definition of discrimination or harassment therefore focuses on patterns of treatment. If someone is doing something that makes you uncomfortable, you should first talk to that person. If it does not stop, then talk to your manager (the instructor). If the instructor is unable or unwilling to help, you should go to the next level of management (Dr. Judi Brown, 475-7701 in this case). Everyone has the right to be free from discrimination and harassment in the work place, and the responsibility to confront it if it happens.