

FORT LEWIS COLLEGE
Department of Physics and Engineering

COURSE: ENGR 221 – Dynamics
11:15 – 12:10 MWF, 610 BH

TERM: Fall 2009

INSTRUCTOR: Dr. Laurie Williams

Office: 601 BH; Office Hours: 10:10 – 11:00 MWF, 2:30-3:25 MW, 1:25 – 2:20 T or by appointment

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COURSE OBJECTIVE: Dynamics is your second course in the study of engineering mechanics. The goal is to develop an understanding of the theory and techniques needed to solve engineering problems that involve Newtonian particle and rigid-body mechanics. This forms a basis for further study in the design and analyses of machines, space science, human movement, structures, fluids flow and many other engineering systems.

COURSE OUTCOMES (with corresponding [ABET Criteria/outcomes](#)):

1. Demonstrate ability to solve kinematics and dynamics problems using Newton's Laws. (Criterion (a, e, and k)).
2. Demonstrate availability to solve kinematics and dynamics problems using The Principle of Work and Energy and the Principle of Impulse and Momentum for a point mass. (Criterion (a, e, and k)).
3. Demonstrate ability to solve kinematics and dynamics problems using Newton's Laws for a planar rigid body. (Criterion (a, e, and k)).
4. Demonstrate ability to solve kinematics and dynamics problems using the Principle of Work and Energy and the Principle of Impulse and Momentum for a planar rigid body. (Criterion (a, e, and k)).
5. This course will also stress the impact of engineering on local and global societies. (Criterion (h)).
6. Research and write a short report on a topic provided by the professor. This will be a team project. (Criterion (d and g)).

PREREQUISITES and EXPECTATIONS: Prerequisite courses include Math 221 and Engr 217. I expect each student to attend all classes and complete all homework assignments. Be at class on time and turn in your homework on time.

TEXTBOOK: Engineering Mechanics, Dynamics, 11th Edition, by R.C. Hibbeler, Prentice Hall Publishing

READING ASSIGNMENT: Complete the reading assignments before each class. Even a superficial first reading the night before will improve your comprehension and retention of the material covered in class.

HOMEWORK PROBLEMS: Homework is as assigned on the [course schedule](#). Homework problems are due at 4:00 PM on the class day following the assignment date unless otherwise stated. Homework should be turned in to the box located in the hall outside the entrance to room 670A and labeled Dynamics, Engr 221. **ALL PROBLEMS ARE TO BE WORKED ON ENGINEERING PAPER AND NEATLY EXECUTED USING STANDARD ENGINEERING FORMAT (SEE NOTES**

BELOW). NO MORE THAN 1 PROBLEM PER PAGE. POINTS WILL BE DEDUCTED ON HOMEWORK THAT DOES NOT COMPLY WITH THE FORMAT SPECIFIED. SLOPPY WORK WILL NOT BE GRADED. HOMEWORK ASSIGNMENTS WHICH ARE LATE WILL BE REDUCED BY 25% FOR EACH CALENDAR DAY LATE. PROBLEMS MORE THAN 4 DAYS LATE WILL NOT BE ACCEPTED. YOU ARE EXPECTED TO DATE LATE ASSIGNMENTS – AN HONOR SYSTEM WILL BE RESPECTED.

HOMEWORK FORMAT:

Homework problems must be neatly and legibly done. Use one side of 8½ “x 11” Engineering paper only.

- a) Given; State briefly and concisely what is known about the problem; do not repeat the problem statement
- b) Determine: State briefly and concisely what must be found.
- c) Draw any necessary diagrams (FBD) and specify coordinate system used.
- d) Show clearly the solution procedure including the controlling equations used (do not use short cuts or skip steps in presenting a solution); and
- e) Present and highlight (i.e., in a box) the answers with appropriate units.

You are encouraged to work with others; however, the work you turn in must be your own.

REPORT: In keeping with ABET’s emphasis on providing opportunities for students to develop communications skills, you will be required to write a short (5-7 page) report. I will provided an open-ended design project later in the semester for you to analyze. Reports are to be typed in Microsoft Word (or similar text processing program), and are to be checked by you for accurate spelling and grammar. As an engineering professional, you will find that the appearance and accuracy of your written documents will matter as much as their technical content; therefore, your reports will be graded on writing quality as well as content. You are encouraged to take advantage of the Fort Lewis writing center for assistance. This report will be due in class on November 16, 2009.

CLASSROOM POLICY: Cell phone calls and text messaging is distracting and rude – neither will be tolerated during the designated class time. Please turn your phones off and put them away, failure to comply with this request may result in the professor asking you to leave the class and 5 points will be deducted for the day.

GRADING: Your final course grade will be determined by the percentage of points the student has earned out of the total possible, as indicated below.

1. Four exams (including a cumulative final exam) (50%)
2. Random Quizzes (10%)
3. Report (15%)
4. Homework (25%)
- 5. Failure to earn a minimum average exam score of 60 percent will result in an automatic failure in this course – regardless of any other percentages noted above.**

MIDTERM: Any student with a midterm course grade of F must meet with Dr. Williams within 5 days of the posted grade (Oct 19). Failure to meet and to provide a satisfactory plan for improving their grade, with Dr. Williams, will be withdrawn from the course by the professor. **IT IS THE STUDENTS RESPONSIBILITY TO ARRANGE THIS MEETING AND TO DEVELOP A PLAN FOR SUCCESS.**

ATTENDANCE: Attendance in class is a required part of this course. Random quizzes can not be made up as a result of an unexcused absence. If a class is missed, the student is still responsible for the material covered and any announcements that may have been made, as well as making

arrangements for missed assignments or exams (attendance on scheduled test days is mandatory excepting only those situations which are demonstrably beyond the student's control).

WITHDRAWALS:

- 1) Withdrawals from the course may be made until September 15, without a record.
- 2) Withdrawals beginning September 16th require the instructor to assign a grade of "W" or "F".
- 3) **After October 23th, no withdrawals from the course are allowed for students with a failing grade.**

POLICY: The following policies (including special needs accommodation) may affect students in this course. Please carefully read these. http://faculty.fortlewis.edu/tyler_c/home/phys-engr_syllabus.htm

SPECAIL NEEDS: "Students with disabilities who require reasonable accommodations to fully participate in course activities or meet course requirements must register with the Disability Services Office. If you qualify for services through the Disability office, bring your letter of accommodations to me as soon as possible."