Southern Polytechnic State University

ENGR 3122: Dynamics, Summer 2013

Instructor: Kevin McFall, PhD

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Location: Q 315

Meeting times: MW 6:00-8:30 pm

Start Date: 06/03/2013

Pre-requisites: ENGR 2214 Statics, MATH 2254 Calculus II

Textbook:
Access to course ID MCFALL3122SU2013 on MasteringEngineering (masteringengineering.com) is required for all students. Every student should have their own copy of the textbook Engineering Mechanics: Dynamics by R.C. Hibbeler although any edition is acceptable in either eText or print format. Consider purchasing an older edition of the print book to save money. Be aware that reading assignments will be given in section numbers for the newest 13th edition and it is the student's responsibility to determine the equivalent sections if a previous edition of the book is used.

Course Catalog Description:
Study of the mechanics of particles and rigid bodies. Topics covered include: kinematics and kinetics of particles; work and kinetic energy; impulse and momentum; rigid body motions; relative motion; and moving coordinate systems.

Learning Outcomes:
- Work particle kinematics and kinetics problems in Cartesian, normal-tangential, and cylindrical coordinates, applying calculus,
- Analyze dependent motion of particles,
- Apply the principle of work and energy to particles,
- Apply the principle of conservation of momentum, and of impulse and momentum to particles,
- Work kinematics problems of rigid bodies in planar motion, and use instantaneous centers of zero velocity to solve velocity problems,
- Solve problems involving impact of particles; and
- Find centroids and mass moments of inertia of rigid bodies using calculus, and apply to problems involving planar kinetics of rigid bodies

Grading Policy

Homework (20 points): Homework is an essential component of the learning experience in this course. Students who successfully complete and understand all the assigned homework problems will find themselves well prepared for the written tests. All homework will be submitted through the online assignment manager MasteringEngineering. Multiple attempts at answering each question are allowed but a 10% penalty is applied for each incorrect response. Submissions are reduced 10% for every hour late. Beware that any activity after the due date, including opening a hint or requesting an answer, will apply the late penalty to the entire problem. To receive unreduced partial credit for incomplete problems, be sure to request the answer for incomplete parts before the due date.

Group exercises (15 points): Most lecture periods with a reading assignment will begin with a "five-minute" group exercise. The purpose of these exercises is to stimulate learning of new material in groups of two members. Questions on group exercises will be short and generally require only that students have thoroughly read the day's reading assignment. Examples of question topics include definitions, identifying symbols or notation, and drawing/interpreting diagrams. The lowest group exercise grade for the semester will be dropped. Group exercises are graded out of 4 points, and any honest attempt at answering the question will receive at least 2 points.

Tests (2×15 points): Two in-class tests will be used to assess progress in the course. Tests consist of four questions, three of which are 28 points each and cover problems similar to those assigned as homework or worked in class. The fourth problem is worth 16 points. It will cover a topic of theory or derivation. Submissions for this problem will receive a grade of 16 points if essentially correct, 8 points if significant progress is made, and 0 points if little relevant information is provided. Neither calculators nor equations sheets will be allowed on the tests. However, both front flaps of the course textbook will be provided. The tests, in general, will be curved in an attempt to maintain an overall class average of a mid C.

Final exam (20 points): The format of the comprehensive final exam will be similar to that of the other tests but twice as long in length. Content covered in the class after the last test will be emphasized. The final exam will be scheduled during the standard final exam period.

Design project: The term design project is more open-ended than traditional homework problems, requiring more sophisticated problem solving techniques which are closer to those skills required of practicing engineers. The results the design project will be documented in a professional quality technical report where the grade will be based 10% on a rough draft, 70% on content, and 20% on quality of layout, formatting, and writing. Projects maybe completed in groups of no more than three members. The grade on the project can be used to replace a test score (not the final exam) or the group exercise grade.

The scale for the final course grade is as follows:

A	90-100
B	80-89
C	70-79
D	60-69
F	0-59

Attendance Policy

Forcing everyone to come to every class is not practical. Each student bears responsibility for material covered in class. If you choose to miss class, that is your decision. However, completion of group exercises goes hand-in-hand with attendance. Note also that late arrival to class will result in working alone on group exercises. Homework can

be scanned and emailed to the instructor if attendance during class is not possible on the due date. In general, late assignments are not accepted nor can make-up tests be administered. Extenuating circumstances can result in exceptions to this rule, but agreement must be reached with the instructor in advance of the assignment or test which will be missed.

Academic Misconduct

At SPSU, academic misconduct is defined as "any act that could have resulted in unearned advantage or that interferes with the appropriate academic progress of others". All acts of academic misconduct will be reported to the Honor Council. For more information see www.spsu.edu/honorcode. The application of the definition of academic misconduct for each category of assignment in this course is describes as follows:

Homework submissions are expected to be the work of only the student whose MasteringEngineering account is used. Copying answers or having other people work out problems on your behalf will not be tolerated. That being said, collaboration with other students on the general solution method is wholeheartedly encouraged, as long as the submission reflects actual work by the student in question. Be aware that many safeguards are in place to prevent and detect cheating such as random problem parameters, login timestamps, and online usage logs. Any cheating will result in a zero grade for the problem(s) in question.

Collaboration among group members during group exercises is obviously encouraged, but assistance of any kind from outside the group will be considered a violation of academic integrity. Any cheating will result in a zero grade for the assignment in question.

Collaboration among group members is obviously encouraged on the design project, but information or assistance of any kind from outside the group, other than from the textbook, must be properly cited. Copying even a phrase from someone else's work is considered plagiarism. Any instance of plagiarism in the report will result in a 33% grade for the project (a full letter grade reduction for the overall grade).

The instructor may decide to refer students directly to the Honor Council in especially egregious cases or when a student is involved in multiple incidences of copying. Students who feel they are unfairly assessed a zero or reduced grade for copying may request referring the matter to be resolved by the SPSU Honor Council.

Tests and the final exam are to be reflections of the individual's work alone. Assistance of any kind, including notes, calculators, cell phones, etc. will be reported as a violation to the Honor Council.

Disability Statement

If you have a documented disability as described by the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) that may require you to need assistance attaining accessibility to instructional content to meet course requirements, please contact the ATTIC at 678-915-7361 as soon as possible. It is then your responsibility to contact and meet with the instructor. The ATTIC can assist you and the instructor in formulating a reasonable accommodation plan and provide support for your disability. Course requirements will not be waived but accommodations will be made, when appropriate, to assist you to meet the requirements.

Communication

Course material will be disseminated in D2L including lecture notes and recordings, homework solutions, old tests, etc. All official course announcements, including instructions when class may be cancelled, will be posted in the D2L course news. Be sure to check D2L regularly.

Course Schedule

Day	Date	Description	Reading	Homework due
Mon	06/03	(1) Rectilinear kinematics	12.1-12.3	
Wed	06/05	(2) Curvilinear motion	12.4-12.6	HW00 (practice)
Mon	06/10	(3) Other coordinate systems	12.7-12.8	HW01
Wed	06/12	(4) Relative motion	12.9-12.10	
Mon	06/17	(5) Equation of motion	13.1-13.4	HW02
Wed	06/19	(6) Equation of motion continued	13.5-13.6	
Mon	06/24	Test 1 and (7) Work and Energy	14.1-14.6	HW03
Wed	06/26	(8) Impulse and momentum	15.1-15.4	
Mon	07/01	(9) Angular momentum	15.5-15.7	
Wed	07/03	(10) Rigid-body motion	16.1-16.3	HW04
Mon	07/08	(11) Relative-motion: velocity	16.5-16.6	
Wed	07/10	(12) Relative-motion: acceleration	16.7	HW05
Mon	07/15	(13) Rotating axis analysis	16.8	Project draft
Wed	07/17	Test 2 and (14) Planar equations of motion	17.2-17.3	HW06
Mon	07/22	(15) Fixed-axis rotations	17.1, 17.4	
Wed	07/24	(16) General plane motion	17.5	
Wed	07/31	Final exam		HW07, Project

This course schedule is subject to modification depending on the pace of the course. However, homework assignments and test dates will not be changed unless students anonymously and unanimously vote for a change.