

MEGR 3121 – Dynamic Systems

Meeting Times:

MWF: 3:00pm – 3:50 pm, COB 208

Help Sessions:

Office Hours: MWF 12:30PM-2PM

COB 232, WebCT Homework Chatrooms,
Scheduled Additional Help Sessions

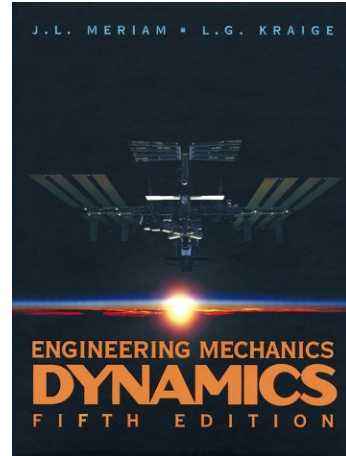
Catalog Data:

Dynamics Systems I. (3)

The kinematics and kinetics of rigid bodies.
Work-Energy and impulse-momentum
principles and conservation laws.
Introduction to the kinematics of mechanisms.

Textbook(s):

J. L. Meriam and L. G. Kraige, Engineering
Mechanics: Dynamics, 5th Ed., John Wiley &
Sons. ISBN 0-471-40645-7



Goals:

The goal of this course is to introduce the students to the mathematical modeling of systems. Students will focus on the dynamic behavior of idealized particle and rigid body models for mechanical components and systems.

Prerequisites:

Grade of C or better in both ESGR 2142 and MATH 1242.

Topics:

Particle Kinematics
Relative Motion and Acceleration
Particle Kinetics
Analysis of Systems of Particles
Work-energy Methods
Impulse-Momentum Methods
Plane kinematics, Instant center
Fixed axis rotation and general motion in the plane
Angular acceleration
Plane kinetics
Gear and pulley systems*
Four-bar linkages*

Outcomes/Objectives:

At the conclusion of this course you will be able to:

1. Model various mechanical systems for dynamic analysis.
2. Identify appropriate solution techniques for systems with various constraints (constant acceleration, conservation of energy, conservation of momentum etc.).
3. Apply work-energy methods to different system states.
4. Apply impulse-momentum methods to systems of interacting components.
5. Model dynamics in a manner suitable for computer solution.

Computer usage:

WEBCT. MATLAB will be taught and used in the class.

Grading:

3 one-hour in class exams each worth 20% of the final grade. One three-hour final exam worth 25% of the final grade, homework worth 10% of the final grade, other quizzes and computer assignments 5% of the final grade.

Follow-up Courses:

MEGR 3121 is a prerequisite for MEGR 3122, MEGR 3114 and a co-requisite for MEGR 3111.

Note on Plagiarism

Plagiarism is defined as an unacceptable practice of using other people's work or ideas without acknowledgement. (from <http://www.google.com/>)

Plagiarism is not limited to writing. It could also include but is not limited to

- Copying a homework solution from information obtained on the internet without acknowledging the source;
- Copying a previously distributed homework solution from me or any other professor without acknowledging the source;
- Copying a paragraph from an encyclopedia, other book or internet site without acknowledging the source.

The key ideas are that plagiarism involves the representation of someone else's ideas as your own and not giving the other person/source the proper acknowledgement. Plagiarism is very serious and is not just an academic integrity issue but a legal one. You may have heard of people being fired from major newspapers for plagiarism. If you get in a habit of doing it, you could very possibly end up in the same position someday, where it is not just a grade that is on the line but your job!

So, I and the graders will look very carefully for evidence of plagiarism (in addition to other academic integrity violations) and ANY violation will be dealt with through the Dean of Students as detailed by the UNC Charlotte Code of Academic Integrity. If you find a solution to a problem and you reference your source you will receive some amount of credit in proportion to the amount of original thought demonstrated in your solution.

If you find this to be a confusing issue, ask yourself the following question before you turn in work with your name.

“If I were asked to swear in court to tell the truth and I was asked if this was my original work, what would I say?”

If the answer is “yes” you are almost certainly ok. If the answer is “no” the add a reference to the source of any non-original information.