

**ME 436: Mechanical Engineering Control
Fall 2013**

Loc./Time: Engr A: Room 222, at TuTh: 5:00 PM to 6:15 PM
Engr A: Room 220, at Tu 4:00 PM to 4:50 PM
Instructor: Om P. Agrawal
Office: Engineering/Technology, E15
Email: om@engr.siu.edu
Phone: 453-7090
Office hr.: TuTh 2 PM to 4 PM

Textbook: Dynamic Modeling and Control of Engineering System (3rd Edition)
Authors: B. T. Kulakowski, J. F. Gardner, and J. L. Shearer
Publisher: Cambridge University Press

Ref. book: System dynamics by Ogata
Modeling and Analysis of Control Systems by Close and Frederick

Course Description:

Teach students analytical and numerical tools and techniques for modeling, analysis, design and control of mechanical, electrical, thermal, fluid, and combinations of dynamic systems.

Topics to be Covered:

1. Modeling of Translational and Rotational Systems,
2. Input-Output and State Space Models,
3. Analytical Solutions of First- and Second-Order Models,
4. Simulation of Dynamic Systems and Their SIMULINK Implementations,
5. Modeling of Electrical, Thermal, Fluid and Mixed Systems
6. System Transfer Functions and Frequency Analysis
7. Closed Loop Systems and Stability Analysis

Grading tools and their weights:

Homework: 10%

I will assign 3 problems everyday (tentatively) (In some cases, I may assign more problems). They will be due after one week. Homework outside the class will not be accepted. The lowest 2 homework scores will be dropped.

Computer assignments: 10%

Students will be required to use Matlab and Simulink toolboxes to solve some of the problems.

Tests and Final:

Scheme 1: 4 tests: 80% and no final

Scheme 2: 3 best tests out of 4: 60% and Final: 20%

Note: You must indicate that you are taking the final; otherwise it will be assumed that you are not taking the final exam.

Fourth test will be very close to the end of the semester. Final will be comprehensive. Your final score will be computed using both scheme, and the highest score will be used to compute the grade.

Final Exam. Time and date: 5:50 PM to 7:50 PM, December 12, 2013

Grade scale: A: 90-100; B: 80-89; C: 70-79; D: 60-69; F: 0-59.

Note: If the overall performance of the class is poor, then I may curve the grade, provided students are coming to the classes and the recitation hours, doing the homework and submitting them on time, and visiting me and the TAs during our office hours.

Incomplete: Incomplete grades will be given only in extreme cases such as a serious accident or illness.

Course prerequisite: ME 261, Engineering 300(?), 335, 351

Note: Additional information about registration for a course could be found at:

<http://registrar.siu.edu/schedclass/index.html>

Emergency Procedures

Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, available on BERT's website at www.bert.siu.edu, Department of Safety's website www.dps.siu.edu (disaster drop down) and in Emergency Response Guideline pamphlet. Know how to respond to each type of emergency.

Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency. The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.