

# Course Syllabus

## Class

TR: 9:30 a.m. - 10:45 a.m., Room A337

## Office Hours

## Tests

Thursday, February 14 (subject to change)

Tuesday, March 12 (subject to change)

## Final Examination

Wednesday, May 1, 7:30 a.m. – 9:30 a.m.

## Course Description

### Prerequisites: EML3018C, EML3014

Introduction to various concepts of modeling and simulation of mechanical systems: models of systems, numerical solution of ODEs, software tools for modeling and simulation of complex mechanical systems.

## Textbook

Notes to be provided

## References

- Haug, E. J., *Computer-Aided Kinematics and Dynamics of Mechanical Systems*, Allyn and Bacon
- Fausett, L., *Numerical Methods Using Mathcad*, Prentice Hall
- Dahlquist, G., *Numerical Methods*, Dover
- Karnopp, D.C., Margolis, D. L., Rosenberg, R. C., *System Dynamics: Modeling and Simulation of Mechatronic Systems*, Wiley
- Woods, R. L. and Lawrence, K. L., *Modeling and Simulation of Dynamic Systems*, Prentice Hall



# Course Goals

The goal of the course is to present some of the fundamentals of modeling and simulation applied to mechanical systems. This includes various modeling and simulation techniques from simple mathematical methods to sophisticated software packages.

## Course Objectives

By the end of the course, a student should be able to:

1. Model various mechanical systems
2. Simulate various mechanical systems
3. Choose appropriate modeling techniques
4. Use suitable simulation techniques, and understand various parameters in simulation techniques
5. Model and simulate complex mechanical systems using multiple tools simultaneously

## Course Outcomes (Numbers shown in brackets are links to course objectives)

1. Model simple jointed systems [1]
2. Simulate simple jointed systems [2]
3. Model and simulate other systems in mechanical engineering [1, 2]
4. Model simple systems using multiple techniques [3]
5. Simulate various mechanical systems [4]
6. Simulate coupled mechanical and non-mechanical systems [5]

## Topics

Potential topics to be covered include (not necessarily in the order shown)

- Modeling of Mechanical Systems
- Simulation of Mechanical Systems
- Solution of ODEs
- Modeling and Simulation techniques and software
- Complex Systems

## Computer Tools

- Pro/E
- MathCAD



- Matlab
- ADAMS
- Other software tools

## Projects

Model, simulate, and analyze various systems using appropriate modeling and simulation tools.

## Grading

Your grade will be based on the following breakdown of graded work:

Homework	15%
Projects	40%
Tests	25%
Final	20%

Grades will be assigned as

90% and above	A
80% to 90%	B
70% to 80%	C
60% to 70%	D
less than 60%	F

## Notes:

**Homework, projects, and examinations, unless otherwise authorized, are to be done individually.** Any blatant copying will result in a 0 for the assignment for all parties concerned. A repeat offense may result in a failing grade for the course.



Assignments are due by the beginning of class of the due date. Any late work will not be accepted without prior authorization. Note that for computer assignments do not plan to do them at the last minute. More than likely, the computers will be down, or they will all be tied up, or the software won't work, or your disk will die or there will be power failure, etc.

Any handwritten assignments are to be neatly written. Start each problem on a new sheet, and any figures drawn should be very clear and neat. Figures should be drawn with straight edge, compass, etc. Failure to meet these guidelines will be penalized up to 2 points per problem.

## Attendance Policy:

*Excused Absences:* Excused absences include documented illness, deaths in the immediate family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. Accommodations for these excused absences will be made and will do so in a way that does not penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

Please note that the College of Engineering has a restrictive interpretation of what is considered a valid excuse for an absence.

See: <https://www.eng.famu.fsu.edu/undergraduate/student-handbook> (Links to an external site.)Links to an external site.. If an absence is to be excused, make sure you check beforehand. In case of excused absence, the instructor will work with you to help you make up for missed time and catch up.

*Unexcused Absences:* Tests and exams missed because of unexcused absence receive the grade 0.

Other projects and activities missed completely receive the grade 0 for those projects or activities.

## College of Engineering Undergraduate Policy:

It is the policy of the College not to assign "plus and minus (+/-)" grades for undergraduate engineering courses

(<https://www.eng.famu.fsu.edu/undergraduate/student-handbook> (Links to an external site.)Links to an external site., see section on Grading Policies).

## Departmental Policy:

A student may continue in the B.S. in ME degree program unless one or more of the following conditions arise (<https://www.eng.famu.fsu.edu/undergraduate/student-handbook> (Links to an external site.)Links to an external site, p. 12):

2. A grade below C in the second attempt of the same engineering course, [https://ww2.eng.famu.fsu.edu/me/resources/pdf/ME\\_Excessive\\_Repeat\\_Policy.pdf](https://ww2.eng.famu.fsu.edu/me/resources/pdf/ME_Excessive_Repeat_Policy.pdf) (Links to an external site.)Links to an external site.



3. More than three (3) repeat attempts in engineering courses, [https://www2.eng.famu.fsu.edu/me/resources/pdf/ME\\_Excessive\\_Repeat\\_Policy.pdf](https://www2.eng.famu.fsu.edu/me/resources/pdf/ME_Excessive_Repeat_Policy.pdf) (Links to an external site.)Links to an external site.
4. Violation of academic honor code as defined in university bulletin or catalog
5. Use of grade forgiveness (currently available for FAMU students only) in more than two (2) courses.

## Makeup Assignments:

A make-up examination may be granted to students with a valid excused absence. However, advance notice must be provided if the absence involves a planned event or observance of a religious holy day. If an emergency prevents attendance at a scheduled examination, notification must be provided at the earliest opportunity. A valid excused absence for the emergency must be obtained to be eligible for a make-up examination. Students with a valid excused absence will not be arbitrarily penalized for missing an assignment.

Students without a valid excused absence are not entitled to a make-up examination. Certain class assignments may be accepted late, with penalty, without a valid excused absence.

## Instructional Method(s)

The primary instructional method is a traditional in-class lecture. There will also be extensive use of the Blackboard web delivery system for distribution of course assignments and other materials. Course materials available from the textbook publisher may also be used.

## Departmental Student Outcomes:

The department's student outcomes can be found at <https://www.eng.famu.fsu.edu/about/accreditation#me> (Links to an external site.)Links to an external site..

### Location of Academic Learning Compacts

ME: <https://www.eng.famu.fsu.edu/about/accreditation/outcomes-alc-sacs> (Links to an external site.)Links to an external site.

FSU: <http://learningforlife.capd.fsu.edu/smalcs/learningCompact.cfm?smalcid=62534> (Links to an external site.)Links to an external site.

## Academic Honor Code:

Students are expected to uphold the Student Code of Conduct and/or University Academic Honor Code published in their respective University Bulletins and/or Student Handbooks.



Florida A&M University is committed to academic honesty and its core values which include scholarship, excellence, accountability, integrity, fairness, respect, and ethics. These core values are integrated into its academic honesty policy. Being unaware of the Academic Honesty Policy is not a defense to violations of academic honesty. Academic Honesty Policy violations shall be reported and appropriate actions taken by the department chair and associate dean for student affairs and curriculum. The complete Florida A&M Student Code of Conduct - Regulation 2.012 (10) (s) can be found here <http://www.famu.edu/officeofstudentconduct/Final%20012%20Student%20Code%20of%20Conduct.pdf> (Links to an external site.)Links to an external site.

The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to ". . . be honest and truthful and . . . [to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy, found at <http://fda.fsu.edu/Academics/Academic-Honor-Policy> (Links to an external site.)Links to an external site..)

## Americans with Disabilities Act:

During the first week of class students with disabilities needing academic accommodation should:

- register with and provide documentation to the CeDar or SDRC; and
- bring a letter to the instructor indicating the need for accommodation and what type.

For more information about services available to FAMU students with disabilities, contact

### **Center for Disability Access and Resources (CeDAR)**

677 Ardelia Court

Florida A&M University

Tallahassee, FL 32307

599-3180 (phone)

561-2513 (fax)

561-2783 (TDD)

[cedar@famu.edu](mailto:cedar@famu.edu)

<http://www.famu.edu/index.cfm?cedar> (Links to an external site.)Links to an external site.

For more information about services available to FSU students with disabilities, contact the:

### **Student Disability Resource Center (SDRC)**



874 Traditions Way  
108 Student Services Building  
Florida State University  
Tallahassee, FL 32306-4167  
(850) 644-9566 (voice)  
(850) 644-8504 (TDD)  
[sdrc@admin.fsu.edu](mailto:sdrc@admin.fsu.edu)  
<http://www.disabilitycenter.fsu.edu/> (Links to an external site.)Links to an external site.

(Please note that instructors are not allowed to provide classroom accommodation to a student until appropriate verification from the Student Disability Resource Center has been provided. This syllabus and other class materials are available in alternative format upon request.)

## University Nondiscrimination Policy Statements

FAMU: <http://www.famu.edu/index.cfm?eop&non-discriminationpolicystatement> (Links to an external site.)Links to an external site.

FSU: [http://www.hr.fsu.edu/pdf/publications/diversity/eeo\\_statement.pdf](http://www.hr.fsu.edu/pdf/publications/diversity/eeo_statement.pdf) (Links to an external site.)Links to an external site.

## Syllabus Change Policy:

Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advanced notice.