

20-ENED-1090**Engineering Models I****2 Credit Hours**

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Office Hours:
Tuesday: 10am – 12noon
Thursday: 9am – 10am

Resources: MATLAB: A Practical Introduction to Programming and Problem Solving, 3rd edition, Stormy Attaway, Elsevier, 2013. Available free on-line through U.C. libraries at:

<http://proxy.libraries.uc.edu/login?url=http://www.sciencedirect.com/science/book/9780124058767>

Software: Students are required to purchase the MATLAB & Simulink Student Suite (R2017a). The software package is \$99 and can be downloaded directly from MathWorks at this website:

https://www.mathworks.com/academia/student_version.html

Notes:

- *DO NOT Purchase MATLAB Student (Unbundled) or MATLAB on the WEB. These cheaper versions do not include all of the software toolboxes you will need for Engineering Models I and II and your upper level courses!*
- *During Installation, you will be asked to select the license type or version of your software – make sure you pick STUDENT VERSION from the drop-down menu.*

Students will also need a copy of Microsoft Excel.

Grading:

Homework Assignments	25 %
Lab Assignments	25 %
Attendance	5%
Quizzes	5%
Midterm	20 %
Final Exam	20 %

Description:

This is the first in a unique sequence of interdisciplinary courses designed to develop good problem solving techniques and to illustrate how engineers use mathematics to solve a variety of practical and often complex problems. The course will apply fundamental theory from algebra, trigonometry, and calculus to relevant engineering applications chosen from a variety of disciplines. Excel and MATLAB® will be introduced and progressively developed as computational tools to enable students to explore engineering concepts, to investigate solutions to problems too complex for hand solutions, and to develop an appreciation of the power and limitations of software tools. Special attention will be given to graphical visualization of concepts and to numerical approximation techniques and the errors associated with approximations.

Objectives:

1. To explore the application of algebra, trigonometry, and calculus to various engineering disciplines.
2. To learn the fundamentals of analyzing and displaying data using Microsoft Excel®.
3. To learn the fundamentals of programming and good programming practices and utilize these skills to solve numerical problems and create numerical algorithms with MATLAB®.
4. To develop good problem solving skills by applying problem solving strategies to a variety of engineering problems.
5. To cultivate effective team-work and communication skills through lab work.

Schedule:

Lecture meets once a week for 55 minutes. Recitation sections meet once per week for two hours. Students are expected to bring their laptops to all lecture and recitation sections.

Policies:

- Make-up Tests are only given under extreme and verifiable circumstances.
- Students are expected to attend all lecture and recitation sessions.
- Lab constitutes a major portion of the course grade and participation is essential. *Any student missing a recitation session must arrange a meeting with his/her instructor to go over the work for that week. Failure to do so will result in a zero for the lab assignment even if the student submits the work via Blackboard.*
- Lab work will be accepted late only in extreme circumstances and by permission of the instructor.
- Homework will not be accepted late once the solutions have been posted; however, the lowest homework score will be dropped.
- Quizzes cannot be made up but the lowest quiz score will be dropped.
- There is NO EXTRA CREDIT for this course.
- Cell phones must be turned off during lecture and recitation.
- The Student Code of Conduct is in effect for this course and every course that is offered at CEAS. Website: http://www.uc.edu/conduct/Code_of_Conduct.html

Course Information:

- All lecture material, lab assignments, and homework assignments will be posted on Blackboard. Student assignments must be submitted on Blackboard by the beginning of recitation the week that they are due.
- Quizzes (via Blackboard) will be given at the beginning of the lecture section almost every week.
- In recitation, students will be broken up into groups of approximately 10 and each group of students will have a teaching assistant (peer level tutor). There will be a grader to grade all homework and lab assignments while the exams will be graded by the instructor.

Topics:

1. Course Introduction
2. Plotting and Curve Fitting in Excel
3. Plotting and Curve Fitting in MATLAB
4. Good Programming Practices and IO Statements
5. Introduction to Conditional Logic
6. Excel Conditions
7. MATLAB Conditions
8. Introduction to Repetition
9. For Loops (MATLAB)
10. While Loops (MATLAB)
11. Data Analysis in Excel

Inclement Weather Policy:

In the event that inclement weather or other situation causes the university to close on the day of one of our scheduled class periods, I will send an email and post an announcement on Blackboard with instructions. Do not assume that because the university is closed, you do not have any responsibilities for this class.

Title IX:

Title IX is a federal civil rights law that prohibits discrimination on the basis of your actual or perceived sex, gender, gender identity, gender expression, or sexual orientation. Title IX also covers sexual violence, dating or domestic violence, and stalking. If you disclose a Title IX issue to me, I am required forward that information to the Title IX Office. They will follow up with you about how the University can take steps to address the impact on you and the community and make you aware of your rights and resources. Their priority is to make sure you are safe and successful here. You are not required to talk with the Title IX Office. If you would like to make a report of sex or gender-based discrimination, harassment or violence, or if you would like to know more about your rights and resources on campus, you can consult the website www.uc.edu/titleix or contact the office at 556-3349.

Special Needs Policy:

If you have any special needs related to your participation in this course, including identified visual impairment, hearing impairment, physical impairment communication disorder, and/or specific learning disability that may influence your performance in this course, you should meet with the instructor to arrange for reasonable provisions to ensure an equitable opportunity to meet all the requirements. At the discretion of the instructor, some accommodations may require prior approval by Disability Services. Please visit <http://www.uc.edu/aess/disability.html> for more information.

Counseling Services:

Clifton Campus Students have access to counseling and mental health care through the University Health Services (UHS), which can provide both psychotherapy and psychiatric services. In addition, Counseling and Psychological Services (CAPS) can provide professional counseling upon request; students may receive five free counseling sessions through CAPS without insurance. Students are encouraged to seek assistance for anxiety, depression, trauma/assault, adjustment to college life, interpersonal/relational difficulty, sexuality, family conflict, grief and loss, disordered eating and body image, alcohol and substance abuse, anger management, identity development and issues related to diversity, concerns associated with sexual orientation and spirituality concerns, as well as any other issue of concerns. For more information visit: <http://www.uc.edu/counseling.html> . After hours, students may call UHS at 513-556-2564 or CAPS Cares at 513-556-0648. For urgent physician consultation after-hours students may call 513-584-7777.

Academic Misconduct:

The Student Code of Conduct is in effect for this course. The following information was copied directly from the following U.C. website: http://www.uc.edu/conduct/Code_of_Conduct.html

(1) Academic Integrity and Honor Pledge

(a) In pursuit of its teaching, learning and research goals, the university of Cincinnati aspires for its students, faculty and administrators to attain the highest ethical standards defined by the center for academic integrity as “a commitment, even in the face of adversity, to five fundamental values: honesty, trust, fairness, respect, and responsibility.” (www.academicintegrity.org/). Although not all students are subject to a college honor code or pledge, every student is bound by the academic misconduct provisions of this code which are enforced, in part, to assure academic integrity.

(b) Some faculty members and academic units may require students before taking tests or when submitting assignments to sign a pledge. The pledge may contain language such as: “On my honor I pledge that this work of mine does not violate the University of Cincinnati Student Code of Conduct provisions on cheating and plagiarism.” Honor pledges serve primarily as a teaching tool; unless a college has a mandatory honor code, pledges are used at the discretion of the instructor without imposition of a disciplinary sanction for students who honestly do passing work but object to a signed affirmation. Alternative pledges as well as information about the Academic Integrity Campaign can be obtained from the OUJA and online at <http://www.uc.edu/conduct>.

(2) Academic Misconduct Definitions**(a) Aiding and abetting academic misconduct**

Knowingly helping, procuring or encouraging another person to engage in academic misconduct.

(b) Cheating

Any dishonesty or deception in fulfilling an academic requirement such as:

- (i) Use or possession of unauthorized material or technological devices during an examination, an “examination” meaning any written or oral work submitted for evaluation or grade.
- (ii) Obtaining assistance with or answers to examination questions from another person with or without that person’s knowledge.
- (iii) Furnishing assistance with or answers to examination questions to another person.

- (iv) Possessing, using, distributing or selling unauthorized copies of an examination or computer program.
- (v) Representing as one's own an examination taken by another person.
- (vi) Taking an examination in place of another person.
- (vii) Obtaining unauthorized access to the computer files of another person or agency or altering or destroying those files.

(c) Fabrication

The falsification of any information, research statistics, lab data, or citation in an academic exercise.

(d) Plagiarism

- (i) Submitting another's published or unpublished work in whole, in part or in paraphrase, as one's own without fully and properly crediting the author with footnotes, quotation marks, citations, or bibliographic references.
- (ii) Submitting as one's own original work, material obtained from an individual, agency, or the internet without reference to the person, agency or webpage as the source of the material.
- (iii) Submitting as one's own original work material that has been produced through unacknowledged collaboration with others without release in writing from collaborators
- (iv) Submitting one's own previously written or oral work without modification and instructor permission.

(e) Violating Ethical or Professional Standards

Violations of any ethical or professional standards as outlined by the academic college.

Allowable Collaboration (Department of Engineering Education):

During this course, you will be encouraged to work with and possibly help other students. It has been shown that students learn more effectively while working together. Since course grades are not curved, there is no penalty for helping someone else. However, there is, at times, confusion over when it is ok to "collaborate with a teammate (or someone in the course)" and when collaborating with someone else turns into academic dishonesty.

1. **TEAM Assignment** – you should feel comfortable talking to anyone on your team (and working side-by-side with them) about any aspect of an assignment from gaining conceptual insight to developing an appropriate model to specifying assumptions to writing out a solution. If the assignment was to develop some kind of computer tool model/solution, working side-by-side with other members of your team to gain conceptual insight, develop logic, outline syntax, and implement/debug said logic and syntax would be considered acceptable behavior. In such cases all individuals involved in the assignment should be appropriately acknowledged in the materials submitted.
2. **INDIVIDUAL Assignment** – you should feel comfortable talking to anyone in the course about an assignment to gain conceptual insight only. Any act other than having a "conceptual conversation," even if mutually agreed upon, would be considered academic dishonesty. If the assignment was to develop some kind of computer tool model/solution, working with others to gain conceptual insight would be considered acceptable behavior. Any act other than having a "conceptual conversation" or "providing debugging insight," even if mutually agreed upon, would be considered academic dishonesty.