MATLAB for Engineers with Applications
ME 1311-02 – Summer 2016

Instructor

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Course Description

Catalog Description

This course provides an introduction to fundamental computing principles and programming concepts. Students use the high-level programming language MATLAB to develop and implement programs to solve engineering problems. Basic programming concepts covered include: algorithm design, data types, flow control, functions, sorting, plotting, simulation, and numerical methods.

Course Details

Term: Summer 2016
Course name: MATLAB for Engineering with Applications
Course number: ME 1311
Section number: 2
CRN: 50927
Meeting times: Tuesday/Thursday 11:00 am – 1:45 pm
Room number: Q-303

Course Objectives

By the end of this course, students should be able to:
- Introduce vectors and matrices in MATLAB
- Apply basic concepts of linear algebra for vector and matrix operations
- Perform 2D and 3D plotting
- Write conditional statements and loops
- Write scripts and functions in MATLAB
- Solve some engineering problems using MATLAB
- Apply the fundamental knowledge of mathematics, science, and engineering to solve real mechanical engineering problems

Textbook

Required online resource: *Programming in MATLAB*, zyBooks.com, enter code
        KennesawME1311McFallFall2016 and click subscribe, cost: $57
Recommended textbook: *Solving Mechanical Engineering Problems with MATLAB*, S.
Nasseri, Linis Learning, 2015, ISBN 978-1-60797-524-3.
Additional resource: <u>An Introduction to MATLAB</u>[1] by Krister Ahlersten

Technical Requirements

A working version of MATLAB, <u>available free of charge for KSU students</u>[2], is
absolutely key to success in this course.

Grading Policy

Homework	20%
Test 01	20%
Test 02	20%
Case studies	20%
Final exam	20%
Total	**100%**

Grade Conversion: A: (90-100), B: (80-89), C: (70-79), D: (60-69), F: (0-59)

Homework

Programming assignments will be collected which can be completed individually or in
groups of two. Source code will be submitted in a D2L Dropbox with filenames
beginning with "HW" followed by 2 digits for the homework number, followed by the
last name(s) of the student(s). Homework written in MATLAB will be submitted as a
single .m file with the filename as described. Only a single submission for groups of two
is required and must be uploaded by the beginning of class on the due date. When
executed, the program will output to the screen the problem numbers and answers.

- Submission requirements satisfied (1 point)
- Significant progress made toward solution (1 point)
- Correct output generated (1 point)
- All elements of problem description properly addressed (1 point)

Tests

Two in-class tests will be administered where students have access to internet-connected
computers to compile and execute programs. Test grades may be curved in an attempt to
maintain the class average in the C range. No assistance from any human may be
solicited during the test period. Source code solving each problem will be uploaded to a

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[1] http://bookboon.com/en/an-introduction-to-matlab-ebook
[2] https://apps.kennesaw.edu/files/pr_app_uni_cdoc/doc/Matlab_DownloadInstructions.pdf

D2L Dropbox before the end of the test in the same manner as homework but with "HW" replaced with "Test" in the file name. Problems will be graded according to the following rubric:

0	Little or no content relevant to solving the problem
30 (F)	Some relevant content but no indication of how to solve the problem
60 (D)	Some indication that the correct solution method is being followed
70 (C)	Significant work showing understanding of how to approach the problem
80 (B)	Primary solution details are complete but significant mistakes are made
90 (A)	Correct solution except for minor mistakes such as sign or algebra errors
100	Problem is answered completely with the correct answer

Case Studies

Two case studies exploring real engineering problems will be completed in teams of two members. Each study will be broken into small tasks building toward the final result. Code will be submitted in a D2L dropbox in the same manner as homework but with "CS" replacing "HW" in the filename.

Final Exam

A cumulative final exam will follow the same format as the tests with "Final" in the submitted filename.

Course Outline

Date		Topic	zyBook	Due
Jun	02	MATLAB environment and variables	1-2, 6.1	
Jun	07	Vectors and matrices	3-9, 10.6, 10.11	
Jun	09	Decision structures	11	HW01
Jun	14	Looping structures	12	
Jun	16	Recitation		
Jun	21	Review – Test 01		HW02
Jun	23	3D plotting	10.7-10.10	
Jun	28	Curve fitting	6.13-6.14	HW03
Jun	30	Matrix operations	9.10	
Jul	05	Numerical integration and differentiation	6.5-6.6	HW04
Jul	07	User defined functions – recitation	13	
Jul	12	Review – Test 02 – Case study 01		HW05
Jul	14	Case study 01		
Jul	19	Case study 01 – Case study 02		
Jul	21	Case study 02		CS01
Jul	??	Final Exam		CS02

I will not be on campus June 28 and July 14. Students are not expected to attend class these days, but recordings and/or exercise problems will be made available.

Course Expectations

Attendance Policy

Forcing everyone to come to every class is not practical. Each student bears responsibility for material covered in class. If students choose to miss class, that is their decision. Class time will be spent explaining the day's content and working problems, under the assumption that all students have read and attempted to understand the reading assignment. In general, late assignments are not accepted nor can make-up tests be administered. Extenuating circumstances can result in exceptions to these rules, but agreement must be reached with the instructor in advance of the assignment or test that will be missed.

Course Communication

Course material will be disseminated in D2L including lecture notes, homework solutions, 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.

Help Resources

Contacts to get Help

Student Help Desk studenthelpdesk@kennesaw.edu or call 470.578.3555
KSU Service Desk[3]
D2L Student User's Guide[4]

Additional Resources

Remote access to Library Resources[5]
Student success Services[6]
Tutoring and Academic Support[7]
Academic Advising[8]
University bookstore[9]

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[3] https://apps.kennesaw.edu/portal/prod/app_its_ask_stu_publ/student/

[4] https://apps.kennesaw.edu/files/pr_app_uni_cdoc/doc/D2LBrightspaceStudentguide_10.3.pdf

[5] http://library.kennesaw.edu/

[6] http://www.kennesaw.edu/studentsuccessservices/

[7] http://learnonline.kennesaw.edu/student-resources/tutoring.php

[8] http://advising.kennesaw.edu/

[9] http://bookstore.kennesaw.edu/home.aspx

University Policies

Academic Honesty

Every KSU student is responsible for upholding the provisions of the Student Code of Conduct, as published in the Undergraduate and Graduate Catalogs. Section II of the Student Code of Conduct addresses the University's policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to University materials, misrepresentation/ falsification of University records or academic work, malicious removal, retention, or destruction of library materials, malicious/intentional misuse of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the University Judiciary Program, which includes either an "informal" resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct's minimum one semester suspension requirement.

Plagiarism Policy

No student shall receive, attempt to receive, knowingly give or attempt to give unauthorized assistance in the preparation of any work required to be submitted for credit as part of a course (including examinations, laboratory reports, essays, themes, term papers, etc.). When direct quotations are used, they should be indicated, and when the ideas, theories, data, figures, graphs, programs, electronic based information or illustrations of someone other than the student are incorporated into a paper or used in a project, they should be duly acknowledged.

Collaboration on assignments among students and other individuals is wholeheartedly encouraged. In order to avoid possible plagiarism issues, limit such collaboration to discussion of how to approach the problem and what strategies, equations, and techniques should be used to solve it. When actually writing down your solution, ensure you are not in the same room as outside collaborators nor referencing a copy of their work. Your solution will then be written in your own words and therefore not plagiarized.

Disability Statement

Kennesaw State University provides program accessibility and reasonable accommodations for persons defined as disabled under Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. Kennesaw State University does not deny admission or subject to discrimination in admission any qualified disabled student.

A number of services are available to help students with disabilities with their academic work. In order to make arrangements for special services, students must visit the Office for Student Disability Services and make an appointment to arrange an individual assistance plan. In most cases, certification of disability is required.

Special services are based on

- medical and/or psychological certification of disability,
- eligibility for services by outside agencies, and
- ability to complete tasks required in courses.

ADA Position Statement

Kennesaw State University, a member of the University System of Georgia, does not discriminate on the basis of race, color, religion, age, sex, national origin or disability in employment or provision of services. Kennesaw State University does not discriminate on the basis of disability in the admission or access to, or treatment or employment in, its programs or activities.

The Americans with Disabilities Act (ADA), Public Law 101-336, gives civil rights protections to individuals with disabilities. This statute guarantees equal opportunity for this protected group in the areas of public accommodations, employment, transportation, state and local government services and telecommunications.

The following individuals have been designated by the President of the University to provide assistance and ensure compliance with the ADA. Should you require assistance or have further questions about the ADA, please contact:

- ADA Compliance Officer for Students: 470-578-6443
- ADA Compliance Officer for Facilities: 470-578-6224
- ADA Compliance Officer for Employees: 470-578-6030

For more information, go to: http://www.kennesaw.edu/stu_dev/dsss.