

"It would appear that we have reached the limits of what is possible to achieve with computer technology, although one should be careful with such statements, as they tend to sound pretty silly in 5 years."

Mathematician John Von Neumann, 1949

"The workers and professionals of the world will soon be divided into two distinct groups. Those who will control computers and those who will be controlled by computers. It would be best for you to be in the former group."

Lewis D.Eigen, Executive VP of University Research Corporation

Catalog Description: Systematic approaches to engineering problem solving using computers. Logical analysis, flow charting, input/output design, introductory computer programming and use of engineering software.

Pre/Co-requisite: Calculus I

Instructors

Section 001 (OSU non-INTO students):

Mr. Sami Al-AbdRabbuh Bat 050

alabdras@oregonstate.edu

Office hours: See Canvas or by appointment.

Section 601 (OSU INTO students):

Ms. Myrna Cavazos Bat 349

cavazosm@oregonstate.edu

Office hours: Tuesday 2:00PM – 3:30PM, Friday 9:00AM – 10:30AM, or by appointment

Textbook: "Matlab: An Introduction With Applications", by A.Gilat, G. Wiley & Sons, any edition. Old editions are OK.

Course Learning Outcomes

To successfully complete this course, students must demonstrate the ability to ...

1. Conceptually understand computer operations, file management, and numeric, character and Boolean data types
2. Using the MATLAB high level programming language, develop internally documented computer programs that utilize sequence, selection and repetition control structures and user-defined functions
3. Mathematically describe and solve engineering problems using vector and matrix operations
4. Generate two- and three- dimensional plots to graphically display the solution of engineering problems
5. Identify sources of computational error and examine the accuracy of numerical solutions

Grading / Course Requirements

In-lab exercises (10%), homework (30%), in-lab quizzes (5%), midterms I and II and final equally weighted (approximately 19% each). Extra-credit opportunities, if any, might be available upon the discretion of the instructor and will be announced during class or on Canvas.

The midterm and final exams are open book/notes, but no electronics of any kind. A make-up exam for the midterm will be given *only* if prior arrangements are made or for documented emergencies. Course assignments, solutions and announcements will be posted on CANVAS.

A note about homework and lab exercises: Homework is an important part of this course! Success on the midterm and final exams depend on computer programming skills developed in the lab exercises and homework assignments. Lab attendance is mandatory. An electronic copy of the labs must be turned into [Teach/Canvas](#) using the supplied format (pdf and MATLAB files). Note that the electronic hand-in

deadline has no flexibility – turn in what you have by the deadline. *Late homework can be turned in without penalty with prior approval only.*

Working Together

Collaboration with fellow students is *highly encouraged*. You may discuss general approaches to homework problems. However, direct copying is plagiarism and against the policies of the University. **You must write up solutions on your own, not as a group. You may not refer to someone else's solutions (including solutions on websites) when writing up your own. Do not send an electronic copy of your code to someone in any form (eg, cut and paste, file copy, email). Re-typing/dictation is considered copying.** Every website/resource you use, and person you work with, must be documented on the homework cover sheet. If you are in doubt about whether or not something is acceptable, please contact the professor. There is a zero tolerance policy in effect for plagiarism and cheating in this class. Copying of any material to be turned in for a grade (including copying and editing) is considered plagiarism. Plagiarism will result in a grade of -10% for the entire homework set containing a copied homework problem (this means your score for a 600 point homework would be -60, regardless of the number of problems you copied). Cheating on an exam will result in grade of -10% on that quiz or exam (this means that your score for a 100 point exam would be -10, regardless of the number of questions you cheated on). All plagiarism, cheating and student conduct issues will be handled in strict accordance to the university's policies as noted at <http://oregonstate.edu/admin/stucon/regs.htm>.

Students with Disabilities

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 541-737-4098.

If you have any questions regarding the course lecture material or homework assignments, do not hesitate to see me during my office hours or contact me by e-mail.

There are plenty of resources for you. Explore what is available for you on Canvas. Consult TAs during office hours for your homework and lab. The HUB (First floor of BAT) provides Matlab tutors. And Matlab software help usually can answer many of your questions.

Tentative Lecture Schedule (see also detailed schedule on Canvas)

Assumes week 1 starts on Jan 4th 2016. Content may shift due to holidays.

Week	
1	Introduction & historical overview Introduction to numeric, character, and Boolean data types Arithmetic precedence rules & MATLAB intrinsic functions MATLAB script files Input/output operations (DISP, FPRINTF, INPUT)
2	Vectors and vector operations 2-D plotting Statistics of an array: (MIN, MAX, MEAN & STD)
3	Program development: MATLAB relational operators/selection structures: IF statements MATLAB repetitive structures: FOR and WHILE loops

4	Program development: User-defined MATLAB functions & function files Anonymous functions Wednesday: Midterm exam I (weeks 1-3)
5	Finding the root and min of a function (FZERO, FMINBND) Numerical Integration & Differentiation (INTEGRAL, TRAPZ)
6	Curve-fitting: Interpolation and cubic splines (INTERP1 , POLYFIT & SPLINE) MATLAB matrix operations
7	Matrix variables, operations, and systems of linear equations Wednesday: Midterm exam II (weeks 4-6)
8	MATLAB matrix operations (cont.) Multivariable functions and data interpolation
9	Character and string manipulations Numeric-to-character data conversions (NUM2STR)
10	Introduction to 3- D graphics Review

Final Exam:

Section 001: Thursday, March 17th, 12:00pm

Section 601: Monday, March 14th, 6:00 pm