

Course Syllabus

EGR115 HYBRID: Introduction to Programming for Engineers

1. Course Information

Term: Spring 2015

Instructor: Dr. Li Ding, dingl@erau.edu, COAS 110, 386-226-6536

Online Learning: at your own convenience but must be completed before the respective lab time

Lab Time: Tue/Thur 9:45 am – 10:45 am (Section 02), 11:15 am – 12:15 pm (section 03), LB 329

Office Hours: Mon 1 pm – 4 pm, and Tue 2pm – 4pm

2. Course Description

This is an introductory course in computer programming for scientists and engineers. This course introduces students to the following aspects of software design and development: specification, requirements, design, code, and test. This course uses a problem solving approach for developing algorithm. Algorithms will be implemented in MATLAB and include the following topics: data types and related operations, looping, decision, input/output, functions, arrays, files, and plotting.

Prerequisite: basic algebra and trigonometry.

Textbooks

There is no required textbook for this course. Practice, practice and more practice! If you do need some books for reference, I would recommend *MATLAB, Third Edition: A Practical Introduction to Programming and Problem Solving*, by Stormy Attaway. Search on Amazon.com with the book title and you should be able to locate it. (An older version should work just fine for this course, too!)

MATLAB & Simulink Student Version Release 2014a is strongly recommended to purchase from ERAU online bookstore (\$99). There is also a Matlab ONLY (no adds-ons) version for students for \$50 online. Check https://www.mathworks.com/academia/student_version/ for both products.

Special Note On the Hybrid Sections

A student's success in a hybrid course strongly relies on his/her self-discipline. Unlike the conventional way of learning, there are no lectures to go to, and no attendance is taken. Instead you will watch course videos, referred to as "online learning", at your own time, location and pace. You may do it at your convenience but I highly recommend you to allocate regular times each week, preferably the day before the lab sessions to get prepared.

Course Websites

Online learning is done through the course website: egr115.com, where you see course information, videos, slides and other course materials.

Assignment submission will be done through the Blackboard course site, <http://erau.blackboard.com/>, where you can also access individual grade reports.

Schedule (subjected to change as necessary)

	Week of	Monday Online Learning	Tuesday Lab/Exercises	Wednesday Online Learning	Thursday Lab/Exercises
01	Jan 05			Syllabus/Tools	
02	Jan 12	Computing/Algorithms		Intro to MATLAB; Variables	
03	Jan 19	Input		Output	
04	Jan 26	Random, Rounding, & Modulus Functions		Operators, Conditionals	
05	Feb 02	<i>Exam 1 review</i>	Exam 1	Conditionals, cont.	
06	Feb 09	Loops		Loops, cont.	
07	Feb 16	Extra: Numerical Methods		Arrays: Intro	
08	Feb 23	<i>Exam 2 Review</i>		<i>Exam 2 Review</i>	Exam 2
09	Mar 02	Arrays, II		Arrays, III	
10	Mar 09	Arrays, IV		Logical / Vector ops	
11	Mar 16	SPRING BREAK			
12	Mar 23	Plotting		Strings	
13	Mar 30	Cell Arrays; Dialogs		Hi-Files	
14	Apr 06	Functions		Functions, cont.	
15	Apr 13	<i>Exam 3 review</i>	Exam 3, Part 1	<i>Exam 3 review</i>	Exam 3, Part 2
16	Apr 20	Projects		Projects	Project Due

3. Course Objectives

Course Goals

Upon successful completion of this course the student should be able to analyze various scientific and engineering problems, design algorithmic solutions to these problems, design algorithmic solutions to these problems, and implement these algorithms in MATLAB. This course is intended to introduce the student to software design concepts, problem solving, and developing software solutions to scientific problems.

Performance Objectives

1. Understand the role of software design as it applies to solving problems using computers
2. Create, edit, compile and execute MATLAB programs
3. Design solutions to problems requiring elementary processing concepts of arithmetic, basic data types and operations, in algorithmic forms and translate them to programs.
4. Design solutions to problems requiring the basic control structures of sequences, selection, and repetition in algorithmic format and implement them with the software.
5. Design solutions of problems requiring the use of files, I/O with files in algorithmic format, and translate to software programs.
6. Design solutions to problems requiring array structures, apply them to the topics of linear search and sorting; implementing the algorithmic solution with software.

7. Apply a top-down design methodology to problems of intermediate complexity, using functions.
8. Solve problems of intermediate complexity requiring the use of non-numerical data such as characters, strings, and the use of the additional numerical data of complex numbers.
9. Learn aspects of the MATLAB programming languages.

4. Assessment

Quizzes	10%
Lab Exercises	10%
Programming assignments	20%
Exams (three in-lab exams)	40%
Final Project	20%

After each online learning session, you will take an online quiz on the Blackboard. These are open-book quizzes and allow unlimited times of attempts. Feel free to do a test drive even before you watch the video to see how much you know about the topic. Only your highest grades on each quiz will be recorded for the final evaluation. You must complete the quiz before respective lab time.

In-lab exercises (mostly small snippet programs) are due at the end of the lab day. Submission is made through the Blackboard. Late submission is accepted for up to two days after it is due, and is subject to 50% penalty.

Programming assignments that require more effort and time are to be given throughout the semester. Submission is made through the Blackboard. Late submission is accepted but is subject to 50% penalty.

There will be three in-lab exams, equally weighted. Exams are provided only **once**. If you missed the exam, you will receive **zero**, no exception. **DO NOT MISS ANY EXAMS.**

Details on the course project will be provided later.

5. Course Policy

Attendance

Students are expected to attend all lab sessions on the campus academic calendar, unless otherwise noted. Attendance is essential for the success of the course experiences. Punctuality and participation are very important in this course, as sessions will involve quick reviews, demonstrations, class activities, discussion, and hand-on exercises.

Please note: **it is student's responsibility to withdraw from a course.** If you are not maintaining a passing grade on required coursework but choose not to withdraw yourself from the class, a failing grade (F) will be assigned for the course grade at the end of the semester. It is strongly recommended that a student who desires to withdraw from a class discuss the withdrawal with his/her instructor and/or his/her academic advisor before taking this action.

Participation

All students are encouraged to complete assigned lab work during the class time.

As a student studying programming language, you should be committed to allocating about **8 to 10 hours a week** outside of classroom hours. Concepts introduced in class must be reinforced by repeated practice. Completing course requirements will insure that you are actively participating in the programming and not just observing the programming.

Completing Your Assignments

Please submit all assignments via Blackboard by deadline or special permission must be requested from the instructor before the due date. All assignments should be of individual effort. In order to fully understand the material covered in lecture, you are strongly encouraged to work on all assignment problems. It is suggested to start your assignment right after they are assigned. Later submission of assignments is subject to 50% penalty.

Office Hours

Besides my office hours listed on the first page, you are welcome to visit other instructors' office hours (check the Blackboard on updates of all office hours). Be prepared with a clear description of the problem that you need help with, since assignments and quizzes are not shared between instructors.

Tutoring

In addition to classes and office hours, tutors will be available to assist you with the course material. They will not give you answers to homework and assignments. Instead, they will provide you with insights into the programming language and offer additional opportunities to practice using Matlab. Please swipe your Eagle card entering a tutoring session. Tutoring occurs in the following times (but are subject to change):

Sun – Thu: 2pm - 10pm (COAS 127)

Academic Integrity

Students may study together but when doing their homework, quizzes, exams, they must do it completely alone. Embry-Riddle aeronautical University is committed to intellectual integrity and considers academic dishonesty a very serious offense. Such offenses including cheating (accepting unauthorized assistance in preparing assignments), fraud (gaining unfair advantage through deceit, trickery, or falsification of records), or plagiarism (taking the ideas, writings, words, and/or work of another or off the internet, and representing them as one's own without appropriate acknowledgement). A student who cheats, commits any form of academic fraud, or plagiarizes in this course may receive an "F" for the course. In addition, the incident will be reported to the Dean of Students. If any other academic integrity violations have been documented, the student will be recommended for dismissal.