Course Syllabus

Overview

E7 is a programming course for engineers. In the first half of the course, you will learn the elements of computer programming you will need to build your own programs and solve engineering problems. Although this course focuses exclusively on programming in MATLAB, many of the programming concepts are extensible to other programming languages. The second half of the course is focused on mathematical models and numerical methods for solving them. In this course, we assume you have taken, or are taking concurrently taking, Math 53. Although it will be helpful for you to have had some exposure to programming and/or linear algebra, we do not assume any knowledge of either in this course.

Lectures will be held in 2050 VLSB from 1-2pm on MW.

Textbook and MATLAB

In this semester of E7, we will be using a draft of a book that we are working on, *An Introduction to MATLAB Programming and Numerical Methods for Engineers*. The format of the book more or less covers the outline of the semester. This book is meant to give you enough background to use computers to solve engineering problems, but removes much of the finer details regarding the more abstract inner workings of computers. For deeper instruction on programming, we encourage you to pursue more advanced computing courses later on. Part I of the book is available at Copy Central on Euclid and Heart Ave. for approximately $12. Part II will be available later on in the semester for approximately the same price.

You will be provided with computers and lab time to work on assignments. However, we cannot encourage your strongly enough to buy a student copy of MATLAB for yourself. In addition to helping you throughout this course, it will be of tremendous value in future courses and has many powerful (and free) toolboxes that you will be able to use throughout your engineering career. MATLAB is available at the Student Store for about $100.

Office Hours

There are many places to get help in this course. Lecture, discussion, labs, and a supplementary lecture are there to give you the maximum exposure to MATLAB programming. You are encouraged to seek help from these before attending office hours. However, if required there are office hours for the instructor and head GSI.

Prof. Bayen:	642 CITRIS
	9:00 – 11:00am, Friday
Timmy Siauw:	TBA
	9:00 – 10:00am, Tuesday

Lab Assignments

To reinforce course concepts you will be given weekly lab assignments. Labs will be assigned (posted on bSpace) on Fridays at 5:00 pm. To give you time to complete your assignments and interact with the GSIs, each student is allocated 2 two-hour lab sessions. You are free to attend a different lab session, more than one, or none, EXCEPT FOR THE FIRST LAB which you must attend. If there is not enough space, students assigned to the current lab session will be given priority. We strongly recommend that you attend at least one lab session per week.

With few exceptions, assignments will be due 5:00pm the Friday after it is assigned. To account for bSpace issues, you will be given a grace period until 7:00pm. There will be NO exceptions after 7:00pm so push the grace period at your own risk.

You will complete assignments by submitting your MATLAB programs to bSpace. Your programs will be graded by an automatic grading system we have designed for E7. This system will help us grade your assignments quickly and fairly and return them to you in a timely matter. The results of your assignment will be posted on bSpace.

You will have until a week after grades are posted to dispute the grade. Afterwards, your grade for that assignment will be final. To dispute grades, you should send an email to e7sp11.grades@gmail.com with your name, SID, the lab assignment number, and file name that are you disputing as well as a memo of why you think the file was graded incorrectly. You will receive an email confirming the disputed problem, and we will fix the problem as soon as we can. This process may take some time as there are many logistical matters to attend to during the semester. Please be patient and be assured that your dispute will be taken into consideration before the end of the semester.

Discussion

In addition to lecture, there are four discussion sections you can attend on Friday. These discussions will be taught by two of your GSIs. You are encouraged to go to these discussions to reinforce concepts introduced in lecture and ask questions that are directed to areas where help is most needed. Discussions are recommended, but not mandatory.

Supplementary Lecture

There will be a supplementary lecture held on Fridays from 1:00 – 2:00pm in 2050 VLSB. The supplementary lecture will be used to provide additional instruction outside regular lecture hours, show you good coding practice, and review for exams. During weeks where additional instruction is required, you will be responsible for any material presented in the supplementary lecture. Other material, such as debugging, is there for your benefit throughout the semester, but is not mandatory. Announcements will be made on Wednesday's lecture whether the supplementary lecture is required.

Exams

One week will be dedicated to reviewing for the midterm and final exams with labs and discussion open and staffed by course GSIs. Exams will be in Scantron form and you are expected to bring a green Scantron and #2 pencil to the exam. You will be allowed only a pencil, eraser, and one letter-sized paper during the exam.

Midterm Exam Date: 2/25/11
Midterm Exam Time: 1:00pm – 2:00pm
Midterm Location: 2050 VLSB
Midterm Review Period: 2/22/11-2/25/11

Final Exam Date: 5/10/11
Final Exam Time: 8:00am – 11:00am
Final Exam Location: TBD
Final Review Period: 5/2/11 – 5/6/11

You will have one week after exam grades are posted on bSpace to dispute the grades. Afterwards, your exam grade will be final.

Project

   You will have a semester project that will contribute to your final grade. You will be able to work on your project with up to two collaborators (groups of three), all of whom must be registered for the course. The semester project is designed to be a fun, competitive, and comprehensive synthesis of the programming concepts you have learned throughout the semester.

   The semester project will be competitive with your programs battling programs written by other groups. A large portion of your semester project grade will be determined by how your program performs in a round robin tournament that will be held at the end of the semester. Further details of this project, including guidelines and important dates will be given at a later time.

Grading

   Your course grade will be determined by labs, your midterm exam score, your final exam score, and your semester project score with the course grade computed according to the following breakdown:

   Lab Assignments: 40%
   Midterm Exam: 20%
   Final Exam: 30%
   Project: 10%

   We understand that you have other obligations, both academic and personal, outside of this course. To compensate for unexpected occurrences, emergencies, or crunch periods, your lowest two lab assignments will be dropped for consideration in your final grade.

   Your final letter grade will be computed on a straight scale unless upward adjustments are necessary. Your grade will not be curved down.

   Straight Scale Grading:

   A : 93 – 100%
   A- : 90 – 93%
   B+ : 87 – 90%
   B : 83 – 87%
   B- : 80 – 83%
   C+ : 77 – 80%
   C : 73 – 77%
   C- : 70 – 73%
   D+ : 67 – 70%
   D : 63 – 67%
   D- : 60 – 63%
   F : < 60%

   We understand that sometimes students with a final score of 89.95% will be frustrated at "missing" their A-. In a large class such as E7, a strict, precise, and well-defined grade cut off is necessary to ensure fairness and consistency. Therefore, we will have the following "bump up" policy: you will be bumped up to the next grade level if you are less than 0.5% away from the cut off and if your homework grade is above 90%. There will be no exceptions to this rule.

Cheating

   Throughout the semester, you are encouraged to collaborate with other students in the class. However, directly copying from your peers' assignments will not be tolerated. Here we give our formal definition of cheating in this course.

<div style="text-align:center;">CHEATING: Turning in work done by another person as if were your own.</div>

   To increase our awareness of cheating, we will utilize the MOSS system developed at Stanford University. You can find out more information about this system at http://theory.stanford.edu/~aiken/moss/ . This system is good at finding programs that are very alike, even if they are altered to look very different (e.g. changing variable names or adding spurious commands).

   In this course we will write computer programs, but keep in mind that we are not computer programs. We will not apply this algorithm indiscriminately. Any pair of students flagged by the system will be approached, and if no cheating has occurred, no administrative action will be taken. If you are not cheating, there is nothing to worry about so feel free to talk to your neighbor!

Schedule

   Here is a breakdown of the semester schedule. A more comprehensive schedule of lecture, exam, lab assignment, discussion, and project dates will be posted on bSpace.

   Week 0:   MATLAB as a calculator
   Week 1:   Variables and Functions
   Week 2:   Branching Statements
   Week 3:   Loops
   Week 4:   Recursion and Plotting
   Week 5:   Review and Midterm Exam
   Week 6:   Representation of Numbers and Complexity
   Week 7:   Linear Algebra
   Week 8:   Least Squares Regression
   Week 9:   Spring Break
   Week 10:   Interpolation and Series
   Week 11:   Root Finding
   Week 12:   Numerical Differentiation and Integration
   Week 13:   Numerical Solutions to Ordinary Differential Equations
   Week 14:   Course Evaluation, Robot Tournament Awards Ceremony