# ESE101 – Introduction to Engineering Tools:

# Matlab and Simulink

# Course Syllabus

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| --- | --- | --- | --- |
| Instructor | Bob Becnel | Building | Urbauer |
| E-mail | becnel@ese.wustl.edu | Room | 216 |
| Section 1 | Thursday, 4:00 – 5:30 PM | Section 2 | Thursday, 5:30 – 7:00 PM |

### Course Description

Matlab and Simulink are important tools in quickly analyzing different designs in many engineering disciplines and are also perhaps the most used software in many engineering schools. Gain skills in the basics of the array-based language Matlab to write programs, including scripts and functions, to calculate and display variables and images. Learn the basics of Simulink to build and simulate models from standard blocks. Discover both Matlab and Simulink in an environment with supervised practice and hands-on experience. Practice problems are chosen from different engineering fields as well as from a few socio-economic fields so that students can see the software being exploited in real life applications. (1 credit hour, pass/fail).

### Text

There are exhaustive resources for Matlab on the Web (<http://greenteapress.com/matlab/>), from Olin Library and through the Matlab workspace. It is not required to purchase a textbook. However, if you are compelled to have book, it is purely your option.

### Course Outcomes

Upon successful completion of this course, the student will:

* Know how to manipulate useful data types in Matlab
* Be able to use Matlab Help to learn about functions
* Be able to write and use scripts and functions in Matlab
* Be able to call a function and interpret/use the result
* Be able to plot data
* Be able to model simple dynamical systems using Simulink
* Be able to traverse between Matlab and Simulink.

### Grade Composition

The grading policy is simple: you pass the course once you complete all in-class exercises and take-home assignments in a timely manner. There will be a final exam.

### Grader

Katherine Shermoen ([kshermoen@wustl.edu](mailto:kshermoen@wustl.edu))

### Grading and Attendance

Please adhere to the academic integrity policy <http://engineering.wustl.edu/ess/academic-integrity.aspx>.

This course is designed so that everybody can pass. I have the following expectations:

* Each student will come to all sessions unless cleared by me. If you can't show up to class, an email is expected in advance and arrangements will be made. If there was an emergency that prevented you from coming, I expect an explanation by email as soon as possible.
* Students should use computers in the lab for purposes related to the lab. Acceptable uses include running MATLAB, taking notes, and internet browsing for help with MATLAB and lab related concepts.
* Students should help each other learn when the instructor is with other students.
* It is highly recommended that students attend each and every class and lab session for the entire time, be on time, and be prepared.

### Planned Course Outline for spring 2014 \*\*Tentative\*\*

Academic Calendar available at <http://engineering.wustl.edu/ess/calendar.aspx>

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| --- | --- | --- | --- |
| Class | Date | HW | Topic |
| 1 | 15 Jan |  | Getting Started |
| 2 | 22 Jan |  | Introduction to MATLAB, operations with scalars |
| 3 | 29 Jan | 1 | Vectors |
| 4 | 5 Feb |  | Plotting |
| 5 | 12 Feb | 2 | Matrix Basics |
| 6 | 19 Feb |  | Linear Equations, Polynomials |
| 7 | 26 Feb | 3 | Creating Functions |
| 8 | 5 Mar |  | Control Functions |
|  | 12 Mar |  | Spring Break – No Class |
| 9 | 19 Mar | 4 | Advanced Plotting |
| 10 | 26 Mar |  | Advanced Topics |
| 11 | 2 Apr | 5 | Introduction to Simulink |
| 12 | 9 Apr |  | Differential Equations with Simulink |
| 13 | 16 Apr | 6 | Connecting Simulink and Matlab |
| 14 | 23 Apr | 7 | TBA |
| 15 | 30 Apr |  | Final Exam Period April 30 – May 6 |