EXCEL EA-1: Introduction to MATLAB Programming

Instructors: Matt Ford (mford@u.northwestern.edu)
Beza Bisrat (bezabisrat2017@u.norhtwestern.edu)
Steven Layne (stevenlayne2017@u.northwestern.edu)
Office Hours: Tuesday and Thursday 2:30-3:30pm, Tech E117
Website: balogun.mech.northwestern.edu/teaching/excel/

Class Time and Location: 1-2:30pm
Lecture: Tech LR5
Lab: Tech E117 (door code: 3636*)
Discussion: Tuesdays 7-9pm and Sundays 6-8pm

Course Objective: Provide an introduction to MATLAB for scientific and mathematical programming. By the end of this course, you will be able to:

- use MATLAB to solve linear systems and characterize their solutions,
- translate simple tasks or problems into MATLAB code using loops, conditionals, and arrays,
- use MATLAB to read, visualize, and interpret data from the real world.

Discussion sections: Beza and Steven will lead two discussion sections per week. You must attend at least one session per week, but you are welcome to attend both.

Grading: You will not be graded on a "curve." There is no target average grade for the course. There is **no** incentive for competition. There are opportunities for co-operation and collaboration, but you must submit your own work. Your grade will consist of the following:

Assignments (30%)
Weekly quizzes (30%)
Final exam (20%)
Final project (10%)
Participation (10%): During the course, I ask that you (1) complete the knowledge survey (un-graded), (2) complete a mid-course evaluation, (3) make your voice heard at least three times, (4) show up to office hours at least once, and (5) participate by completing un-graded in-class "minute papers."

Assignments: Homework assignments may include MATLAB code and hand-written problems. For the MATLAB portion, you will be given a partially filled code template with instructions for completion. Convert your MATLAB script to a PDF file with results using the "Publish" feature in MATLAB. **Note: You must document (comment) EVERY LINE OF CODE that you write. You will learn how to do this on Wednesday.**

Quizzes: There will be 3 weekly quizzes on Thursday of the first three weeks. Quizzes will be graded and returned on Friday. You will have the option of repeating **one quiz during the course**. Only the higher of the two grades (the original grade or the make-up grade) will be recorded. Use this option wisely. This choice is offered to you with the understanding that life is life and unexpected things happen. If you bomb one quiz it will not jeopardize your grade for the course.

Final Exam: The final exam will be held on Monday July 29th.

Course Calendar - 2016

Topics and assignments are subject to change

Shaded days will take place in Tech LR5. All other days will take place in Tech E117.

Date	Topics	Readings and assignments
Tuesday 6/28	Course introduction Matrices and vectors linear combinations and Matrix multiplication	*HW1 assigned*
Wednesday 6/29	Introduction to MATLAB Scalar arithmetic Creating arrays	
Thursday 6/30	Array arithmetic Element-wise and array operations	**Quiz 1: array creation and scalar arithmetic**
Friday 7/1	Systems of linear equations Row reduction and inverse matrices	
Week 2		
Monday 7/4	*Holiday – no class*	
Tuesday 7/5	Logical operators If/Else statements	*HW2 assigned*
Wednesday 7/6	Flow control For/while loops	*HW1 due*
Thursday 7/7	Flow control (2) Debugging	**Quiz 2: Linear systems, Boolean logic, and flow control**
Friday 7/8	Flow control (3) Basic algorithms	
Week 3		
Monday 7/11	Linear models and regression	
Tuesday 7/12	Computer graphics Linear transformations	*HW3 assigned*
Wednesday 7/13	Reading and analyzing data (1)	*HW2 due*
Thursday 7/14	Reading and analyzing data (2)	**Quiz 3: linear models and linear transformations**
Friday 7/15	Dynamical systems modeling	
Week 4		
Monday 7/18	Introduce in-class projects	
Tuesday 7/19	In-class project	*HW3 due*
Wednesday 7/20	In-class project	
Thursday 7/21	Project presentations	
Monday 7/25	**Final Exam**	