

# PSYC 592-013 – MATLAB for Psychologists

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Thursdays, 3:00am – 4:15pm. East Building 121

**Instructor**

Dr. Martin Wiener

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**Office Location**

David King Hall, Room  
2055

**Office Hours**

Wednesdays, 10:00am-  
11:50am,

**Grade Criteria**

<u>Grade</u>	<u>Percent</u>
A	90-100%
B	80-89.9%
C	70-79.9%
D	60-69.9%
F	Below 60%

**Course Overview**

Programming is quickly becoming a vital part of Psychology, Neuroscience, and the Behavioral Sciences at large. However, there is presently a dearth of programming courses available to graduate and undergraduate students as part of behavioral and neuroscience curricula. This class aims to undo that imbalance, right here at Mason! Whether you are conducting EEG experiments, social psychology studies, clinical research, or surveys, there will be something in this class for you. Learning to program in Matlab will open doors to a wide variety of possibilities for your data, experiments, and even future career prospects. This class aims to provide the necessary fundamentals to students who know little about coding, and provide them with the tools necessary for doing their own future work.

**Format**

This class will be conducted in a “hybrid” format. In-person lectures will be held every Thursday on-campus at 3pm. For the online portion, video-lectures will be uploaded each week for you to access from the Blackboard site. These videos may be watched at a time of your choosing, provided they are viewed before the in-person class for each week.

**Required Text**

MATLAB for Brain and Cognitive Scientists. *Michael X. Cohen*. MIT Press. 978-0262035828

**Evaluation Criteria**

Homework (50%): Every week there will be (1) homework assignment due by the following Wednesday evening at midnight. Homeworks can be accessed and submitted via the Blackboard site for this course. All submitted assignments will take the form of Matlab “.m” files, with inline notes to describe answers to questions.

Final Assignment (50%): At the end of the semester, you will present a final “data project”, taking the form of a dataset of your choosing, along with a produced script or function to import that dataset, manipulate the data, save an output and present figures. The data you use may come from your own research, or may be randomly generated in a given form, or drawn from a public repository. Prior submitting the final assignment, we will discuss possible options on what your final project will look like.

**General Policy**

Honor Code: George Mason University has an Honor Code, which requires all members of this community to maintain the highest standards of academic honesty and integrity. Cheating, plagiarism, lying, and stealing are all prohibited. All violations of the Honor Code will be reported to the Honor Committee. See honorcode.gmu.edu for detailed information.

Plagiarism is the unacknowledged use of another person's labor, another person's ideas, another person's words, or another person's assistance. Unless otherwise stated in class, all work done for courses -- papers, examinations, homework exercises, laboratory reports, oral presentations -- is expected to be the individual effort of the student presenting the work. Any assistance must be reported to the instructor. If the work has entailed consulting other resources -- journals, books, or other media -- these resources must be cited in a manner appropriate to the course. Everything used from other sources -- suggestions for organization of ideas, ideas themselves, or actual language -- must be cited. Failure to cite borrowed material constitutes plagiarism. Undocumented use of materials from the World Wide Web is plagiarism. If you are caught plagiarizing or cheating, you will be referred to the honor committee and, if found guilty, will fail the assignment, and, depending upon the severity of the violation, you may fail the class.

**Disability Statement:** If you are a student with a disability and you need academic accommodations, please see me and contact the Disability Resource Services (DRS) at [703-993-2474](tel:703-993-2474). All academic accommodations must be arranged through that office. Please see me as soon as possible about this, as I will not adjust grades for exams after they have been given.

**Make-up policy:** Make-up exams will only be given if exceptional circumstances are claimed AND substantiated. I must see proof of what you are claiming to verify that it is true.

**Add/Drop Deadlines:** Please note that the *last day to add classes* is **August 29<sup>th</sup>**. The last day to drop a course *with no tuition penalty* is also **September 6<sup>th</sup>**. The last day to drop *with a 50% tuition penalty* is **September 13<sup>th</sup>**.

**Attendance:** Attendance is not required for this course. However, it is vitally important that you come to every class. We are only meeting once a week, and on that day will cover many of the necessary coding and programming aspects of the following homework assignment. If you know that there is an upcoming class that you must miss, please let me know.

**Official Communications via GMU E-mail:** Mason uses electronic mail to provide official information to students. Examples include communications from course instructors, notices from the library, notices about academic standing, financial aid information, class materials, assignments, questions, and instructor feedback. Students are responsible for the content of university communication sent to their Mason e-mail account and are required to activate that account and check it regularly. If class has to be canceled, you will be informed via e-mail. Information will be provided in the e-mail about making up the missed class.

**Technology:** For this class, we will be using MATLAB software. MATLAB, unlike other programming languages, is not free and must be purchased. Some of you may already have Matlab available to you, in which case you are permitted to continue using it. GMU also provides Matlab to all University students free of charge. To download Matlab, you can go to the mathworks website ([www.mathworks.org](http://www.mathworks.org)), click on the link “get Matlab” in the upper-right corner. You will then be prompted to make an account (use your GMU e-mail address). After that, you will see an option to “get Matlab access now”. Click that, and you will be able to enter your GMU login and password, which will allow you to download Matlab to your computer. If you do not wish to download Matlab, you may also use Octave, a free alternative to Matlab (<https://www.gnu.org/software/octave/>); however, please note that there may be issues with compatibility between Octave and Matlab for in-class exercises. Matlab is also available free to GMU students on certain University computers on campus; also, it may be accessed via the Virtual Computing Lab through a Virtual Machine (<https://its.gmu.edu/service/virtual-computing-lab/>).

For this class, it is requested that all students bring a laptop computer with them to class with Matlab on it. The class will be conducted in a “live coding” environment, in which students will follow along in coding exercises on their laptop. If you do not have a laptop available to you, please let me know and we will work to find a solution.

**Slack:** To aid in the live coding environment for class, we will be using the application Slack (<https://slack.com/>) for all communication within and between classes. Slack is an application that can be run within a browser window, as a stand-alone

application, or on your phone (not recommended for this class). It is recommended that you have both Slack and Matlab open while the class is going on.

### **Course Schedule:**

The class schedule below is the general outline of what will be followed. Readings will accompany each week. The course schedule below is a general guide; particular topics may be extended or shorted given how long or quickly it takes to cover them sufficiently for the rest of the class. The last three classes in the semester are listed as TBA: we will discuss what topics to cover then based on the interests of students in the class. This could be EEG or fMRI data analysis, psychometric functions, machine learning, or any other advanced topic.

Date	Topic
8/25	Introduction to MATLAB and Programming Concepts
9/1	Vectors, Matrices, Punctuation, Indexing
9/8	Basic operators for manipulating and visualizing data
9/15	Summary statistics and other details
9/22	Handling files, directory structures, importing and exporting data
9/29	Scripts and Functions; Conditional statements and loops
10/6	Creating, manipulating, and saving figures
10/13	Fitting models to data
10/20	Automating Analyses
10/27	Debugging
11/3	TBA
11/17	TBA
12/1	TBA