# GG250 Lab 1
## Introduction to Matlab, functions, and scripts

The purpose of this lab is to introduce a few examples of how Matlab operates, and to introduce Matlab scripts and functions.  You will need to access my web page to download files.  My URL is

> http://www.soest.hawaii.edu/martel/Stevem.html

Exercise 1_1
a)  Download the following m-files from my web page:
    script_template
    function_template
and save them in your GG250 directory.

b) Open up these m-files, read what they do, and run them.

c) Copy them to new files, and save them with the following names:

> gg250_lab_01_1a_lastname.m
> gg250_lab_01_1b_lastname.m

Type your last name (don't type "lastname") at the end of the title.  We will use this naming format for many if not all the m-files you turn in as lab assignments.  NOTE THAT THE M_FILES HAVE lowercase NAMES.  Use lowercase names, with underscores (not blanks) in the m-file names!

d) Send the two renamed files as e-mail attachments to gg250-lab@hawaii.edu , and list the subject in the e-mail as
> gg250_lab_01_1

Exercise 1_2 (Integration script)
a)  Download the following m-file:
    int_script_template.m
and save it in your GG250 directory with the following name:
    gg250_lab_01_2_lastname.m
If you mess up the m-file in the course of the work on it, you can always download a new copy.

b)  Open up this m-file, read what it does, and run it to find the area under the curve.

c)  Find the area under the curve for three different values of dx: 1, 0.1, and 0.01.

d)  Send the three dx values and the three areas in the body of one e-mail message to gg250-lab@hawaii.edu , and list the subject in the e-mail as
> gg250_lab_01_2

Exercise 1_3 (Integration function)
a)  Download the following m-file:
    int_function_template.m
    and save it in your GG250 directory with the following name:
    gg250_lab_01_3_lastname.m

b)  Open up this m-file and modify it by filling in the lines that end in semicolons(;) so
    that you make a function for numerical integration.  Use the file
    int_script
    from exercise 1_2 as a pattern for the function m-file.

c)  Find the area under the curve from x = 0 to 10 for three different values of dx: 1, 0.1,
    and 0.01.

d)  Send the three dx values and the three areas in the body of one e-mail message,
    with your renamed integration function to gg250-lab@hawaii.edu , and list the
    subject in the e-mail as
    gg250_lab_01_3


Exercise 1_4 (Differentiation script)
a)  Download the following m-file:
    der_script_template.m
    and save it in your GG250 directory with the following name:
    gg250_lab_01_4_lastname.m

b)  Open up this m-file and modify it by filling in the lines that end in semicolons(;) so
    that you make a function for numerical differentiation.  Use the file from exercise 1_2
    as a pattern.  Run the file to test it to make sure the script works.

c)  Send the file as an attachment in an e-mail message to gg250-lab@hawaii.edu , and
    list the subject in the e-mail as
    gg250_lab_01_4

Exercise 1_5 (Differentiation function)
a)  Copy  your m-file of exercise 1_4 and save it in your GG250 directory with the
    following name:
    gg250_lab_01_5_lastname.m

b)  Modify this file to produce a function m-file for numerical differentiation in the manner
    of exercise 1_3. Run the file to test it to make sure the script works.

c)  Send the file as an attachment in an e-mail message to gg250-lab@hawaii.edu , and
    list the subject in the e-mail as
    gg250_lab_01_5