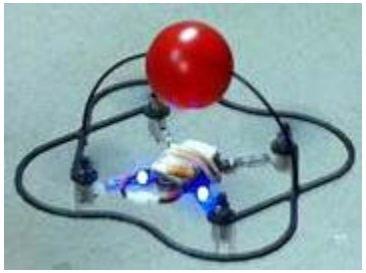
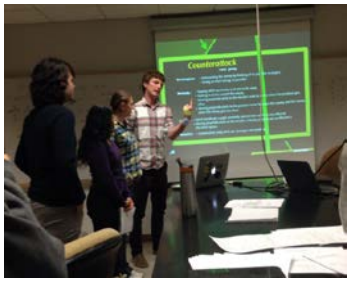
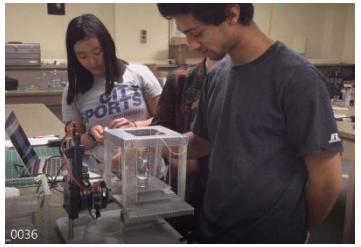


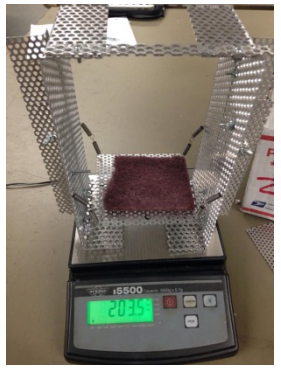




EN40 Dynamics and Vibrations

Allan Bower, Jimmy Xu

Spring 2018



Organization

- Course Web: Google ‘Dynamics and Vibrations’
  (see also Brown Canvas)

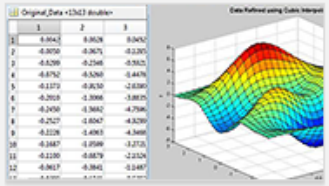
- Lectures: 9-10:20am, Tu, Th, B&H 166. Required
  Lectures will present new material. Main intro to class tomorrow

- Sections 9, 10, 11, 1, 2 MW. You can attend any section you like; attendance is optional
  Review confusing topics; additional examples; HW help

- FIRST TWO SECTIONS (today and Mon) WILL COVER NEW TOPICS IN MATLAB (not covered in lectures)

- More details on class to follow tomorrow.

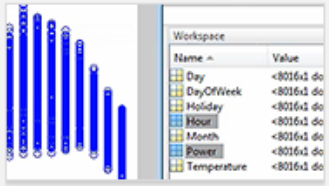
MATLAB The Language of Technical Computing



Numeric Computation

Use mathematical functions to solve science and engineering problems

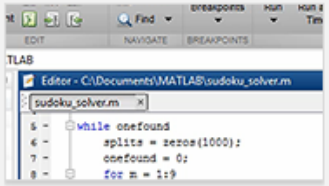
» Learn more



Data Analysis and Visualization

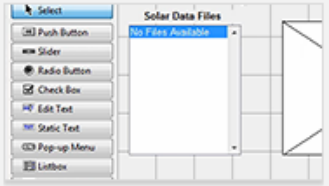
Explore, visualize, and model your data

» Learn more



Programming and Algorithm Development

Create and optimize algorithms using the high-level language and development tools



Application Development and Deployment

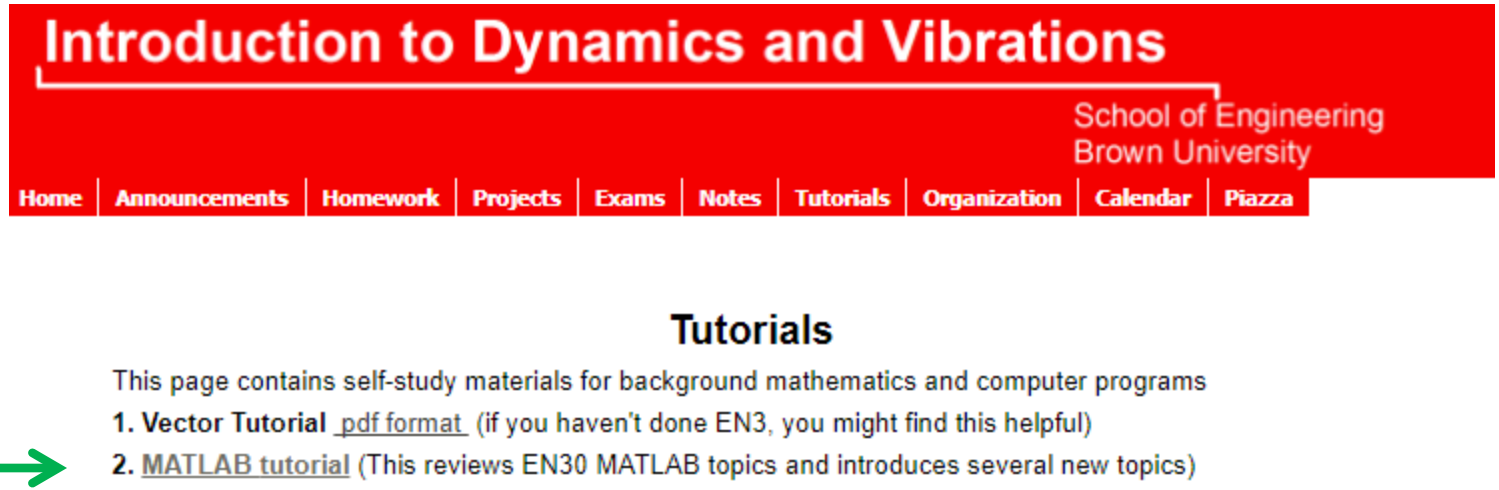
Develop and share applications as code, executables, or software components

MATLAB: one of several commercial software packages that help with calculations (data processing; math; some design packages built in; simple programming)

In EN40 we will use it for (i) data processing and plotting; (ii) algebra (Live Scripts); (iii) To solve differential equations that are two difficult to solve by hand (iv) Data acquisition for projects.

Matlab skills you will need for EN40

- Using ‘Live Scripts’ for plotting, calculus and algebra.
- Basic programming with ‘m’ files
  - Vectors/matrices
  - Loops
  - Conditional statements
  - Functions
  - Using ode45 to solve ODEs



First Homework is posted
Topics from MATLAB tutorial
Due (through canvas) Fri Feb 2.

Introduction to Dynamics and Vibrations

School of Engineering
Brown University

Home | Announcements | Homework | Projects | Exams | Notes | Tutorials | Organization | Calendar | Piazza

Homework

2018 Assignments

1. Matlab Assignment Due Friday February 2 2018 Please work through the Matlab tutorial before starting HW1

General Homework Policies:

- Homework will be assigned on Thursdays and will be due **by noon** the following Friday.
- **Submitting Homework:** You can use either of the following methods to submit homework:
  - Upload a pdf file to canvas (you can upload a scanned pdf - see below for suggested scanner apps) or
  - **Both: (i) Go to Canvas, and use the Text submission option to tell us that you are submitting a hard copy**, and **(ii)** Place a paper copy in the boxes provided on the 7th floor of Barus-Holley building, North side, opposite Stephanie Gesualdi's workstation. (HW #1 is submitted on Canvas

- We will not count your lowest homework grade when computing your final grades. This is meant as an automatic homework excuse for sickness or an emergency. You don't need to request extensions on homework - we will just tell you to use the automatic excuse....
- **Collaboration policy:** You may work on homework problems as a group. However, any work submitted for grading must represent work done by the person who will receive credit for the assignment. It is not acceptable for two students to submit identical copies of a homework problem. It is not acceptable for one student to copy work previously done by another.
- **Regrade requests:** Please fill out the regrade request form (please submit a separate form for each assignment you need regrading), and (if necessary) place a copy of your paper assignment in the regrade box on North side of 7th floor of Barus-Holley building

IMPORTANT: We make up our own homework problems instead of taking them from a book, to make the course more up to date and relevant. One regrettable consequence of this policy is that the ***homework assignments will almost certainly contain mistakes***. If you find something in an assignment that doesn't work out, check with a TA or faculty member to see if there is an error before spending hours looking for your own error.

Goal for Sections (Jan 24, Jan 20, Jan 31)

Worked examples on the following topics:

- Vectors/matrices
- Loops
- Conditional statements
- Functions
- Solving ODEs using ‘Live Scripts’
- Using ode45 to solve ODEs

HW 2012 – Creating a vector with a loop; conditionals; plotting

1. Using a loop, create a vector called x that contains 401 equally spaced points, starting at -10 and ending at +10

2. Using the solution to problem 1, plot a graph of

$$y = \sin(5x) + \sin(5.5x)$$

for $-10 < x < 10$

3. Plot a graph of $w(v) = \begin{cases} \cos(v) & \cos(v) \geq \sin(v) \\ \sin(v) & \cos(v) \leq \sin(v) \end{cases}$

for $0 \leq v \leq 4\pi$