**Class 30** –**Alternatives to Matlab and Review**

ChE310\_Sec1\_F2019 / 12.12.2019

<http://www.reuelgroup.org/numerical-methods-che-310.html>

Announcements:

* Grading update – everything posted by 12.20 PM, CHECK YOUR GRADES, will submit grades by 12.23.
* Course evaluations (ISU + RMP) – 5 pt. extra in PSET
* Last office hours: noon-1 help on Friday, 2:30-4 Mon and Tues w/ Dr. Roling and Reuel, Wed by apt. with Adam
* Final 12.19 (Thursday) 7:30 to 9:30 AM

**Outline for Class 30 Lecture**

1. How to study for Dr. Reuel’s final
	1. Organize materials (code, examples, etc.)
		1. Word document
		2. One Note
		3. Power Point
	2. Understand keys (what does every line do? How do functions work?)
	3. Answer questions as group
	4. Sleep
2. Final format
	1. 1 closed book section, 10 problems (20pts)
	2. 3 free-response, open book problems (60pts)
	3. 2 hours, keep moving
	4. Gauge time by point value (1 pt =~ 1 minute)
	5. Come in 5-10 min early to get set up and relaxed
3. Matlab alternative – GNU Octave
	1. <https://www.gnu.org/software/octave/>
	2. Free!
	3. Syntax is identical to Matlab
	4. There are some toolbox features that are NOT available. However, these are being developed (by volunteers/rebels) in Octave Forge.
	5. Example: cyst nematode counter





1. Matlab alternative – Learn Python
	1. MIT EdX Python Course: <https://www.edx.org/course/introduction-computer-science-mitx-6-00-1x8>
	2. Coursera (20 courses): <https://www.coursera.org/courses/?query=PYTHON>
	3. Code Academy: <https://www.codecademy.com/learn/python>
	4. Grok Learning (first 2 modules free): [https://groklearning.com](https://groklearning.com/)
	5. Enthought Python Training: [https://training.enthought.com](https://training.enthought.com/)
	6. Learn Python Programming in One Video: <https://youtu.be/N4mEzFDjqtA>
	7. Udemy (150 courses, 10 free): <https://www.udemy.com/courses/search/?q=python>
	8. MIT OpenCourseWare: YouTube Playlist - <https://goo.gl/PaiQhQ>

**Thanks to Prof. Hedengren @BYU for** [**list**](http://apmonitor.com/che263/index.php/Main/PythonIntroduction)

1. Python install options
* Version 2.7 vs. 3
* Python from python.org (comes with ‘IDLE’ = Integrated Development and Learning Environment)
	+ Shell = command line
	+ Editor = where you write and save your scripts/functions
* pip – method to manage and install packages [like Matlab toolboxes]
	+ [matplotlib](https://matplotlib.org/) and numpy / scipy (<https://scipy.org/> )
* Other editors available – like ‘spyder’ from the [Anaconda project](https://www.anaconda.com/download/)
1. Quick Demo with Python
* Open IDLE
* Show how to install matplotlib
* Plot two vectors, change colors, show labels, etc.
* <https://matplotlib.org/users/pyplot_tutorial.html>
1. Other languages? Become a polyglot!
	1. <https://www.theregister.co.uk/2019/04/18/microsoft_bosque_programming_language/>
	2. Arduino / C / C++
	3. Java
	4. Many good books. Birthday presents for years to come…
2. Review Topics
	1. How to identify a problem?
	2. Other questions?