

Jeff Anderson's Learn MATLAB Playlists

Below is a list of YouTube playlists that I created as supplementary materials for my ENGR 11 course. You can find these, and many other additional resources, that I provide to my students on our course homepage:

<http://www.appliedlinearalgebra.com/blog/for-students/welcome-to-engr-11>

I provide links to both the playlists and the individual videos found within. I also show the length of each video. Finally, the column labeled "Complete" is a great place to track your progress through these videos. I recommend that you track the amount of time you spend watching each video in that column. If you are writing all lines of code for yourself, taking notes and struggling in productive ways in each video, I bet that you'll spend more time than the length of each video (my bet is that the ratio is somewhere between 2 and 4: you'll spend 2X – 4X the amount of time watching each video than the length of the video itself).

The best way to figure out how long it takes you to watch this content is to track your work. If you get in this habit early in the class, you'll collect a lot of data to help guide your guesses about how long it takes you to watch these videos and take notes on the content. One of the most difficult aspects of learning in college is [accurately predicting how much time it takes to learn](#) material. By systematically tracking your progress, you'll build insights into that larger question.

ENGR 11, Unit 1, Lesson 1, Part 1

[The MATLAB Desktop](#)

(9 Videos : 1 hour, 53 min, 34 sec)

Video Title	Length	Complete
1. Play with the MATLAB Desktop	7m, 14s	
2. How to show the virtual keyboard?	3m, 18s	
3. How to use the command window in MATLAB?	9m, 27s	
4. How to define variables in MATLAB?	8m, 31s	
5. How to perform basic arithmetic in MATLAB?	13m, 05s	
6. How to use MATLAB's built-in functions?	20m, 53s	
7. How to define scalar variables in MATLAB?	17m, 24s	
8. What are the rules for MATLAB variable names?	14m, 56s	
9. How to manage variables in MATLAB's Workspace?	18m, 44s	

ENGR 11, Unit 1, Lesson 1, Part 2

[Script Files](#)

(7 Videos : 1 hour, 55 min, 55 sec)

Video Title	Length	Complete
1. What is the MATLAB Toolstrip?	13m, 43s	
2. How to connect with MATLAB's online community?	9m, 41s	
3. What are MATLAB script files?	27m, 15s	
4. What are features of a good algorithm?	6m, 16s	
5. How to draw flowchart diagrams?	13m, 23s	
6. How do I comment my MATLAB script files?	15m, 23s	
7. How to change current folder in Command Window	30m, 07s	

ENGR 11, Unit 1, Lesson 2, Part 1

[Create Arrays](#)

(6 Videos: 2 hour, 3 min, 11 sec)

Video Title	Length	Complete
1. How to create column vectors in MATLAB?	10m, 28s	
2. How to create row vectors in MATLAB?	8m, 22s	
3. How to create row vectors using the colon operator?	13m, 49s	
4. How to create row vectors the using linspace function	18m, 01s	
5. How to define matrices in MATLAB?	17m, 49s	
6. How to address individual entries of a matrix?	18m, 49s	

ENGR 11, Unit 1, Lesson 2, Part 2

[Play with Arrays](#)

(6 Videos: 1 hour, 31 min, 38 sec)

Video Title	Length	Complete
1. How to use colon notation to address arrays	24m, 49s	
2. How to create zeros, ones, or identity matrices?	6m, 57s	
3. How to use the transpose operator	15m, 37s	
4. How to add or delete entries in an existing matrix	8m, 34s	
5. How to define block matrices	17m, 43s	
6. What are built-in functions for handling matrices?	17m, 53s	

ENGR 11, Unit 1, Lesson 3, Part 1

[Logical Data](#)

(8 Videos: 1 hour, 34 min, 14 sec)

Video Title	Length	Complete
1. What is the logical data class?	18m, 47s	
2. What is a logical scalar?	7m, 41s	
3. What is a logical vector?	11m, 55s	
4. What is a logical matrix?	7m, 10s	
5. How can we accurately refer to the size of logical data?	4m, 27s	
6. What is the logical NOT operator?	10m, 03s	
7. What is the logical AND operator?	19m, 15s	
8. What is the logical OR operator?	14m, 48s	

ENGR 11, Unit 1, Lesson 3, Part 2

[Logical Play](#)

(11 Videos: 1 hour, 33 min, 42 sec)

Video Title	Length	Complete
1. What is the form of a logical operator?	10m, 58s	
2. What are compatible sizes for logical operators?	18m, 43s	
3. What is the logical XOR operator?	9m, 21s	
4. How to combine logical operations?	8m, 22s	
5. What are equivalent propositions?	6m, 31s	
6. What are relational operations?	11m, 43s	
7. How to test for equality?	9m, 57s	
8. How to test inequality relationships?	4m, 59s	
9. How to use the isa function?	12m, 59s	
10. How to test the state of MATLAB entities?	4m, 22s	
11. How does logical indexing work?	6m, 55s	

ENGR 11, Unit 1, Lesson 4:

[Control Flow](#)

(4 Videos = 1 hour, 37 min, 53 sec)

Video Title	Length	Complete
1. How to write an if statement?	25m, 11s	
2. How to write an if/else statement?	28m, 53s	
3. How to use for loops in MATLAB	25m, 15s	
4. How to use for loops with vectors	18m, 30s	

Linear-Systems Project: Part 1

[Introduction to the Electronics Learning Laboratory Kit](#)

(12 Videos: 2 h, 5m, 3s)

Video Title	Length	Complete
1. Introduction to the Linear Algebraic Nodal Analysis Algorithm Learning Lab	2m, 19s	
2. The Electronics Learning Lab Kit for Linear Algebraic Nodal Analysis	6m, 14s	
3. What is a Solderless Breadboard?	13m, 23s	
4. Introduction to Resistors	13m, 56s	
5. Introduction to DC Voltage Sources	10m, 5s	
6. Introduction to DC Current Sources	6m, 6s	
7. Let's build our first circuit with a resistor and dc voltage source	9m, 25s	
8. How do we measure the voltage drop across an element using a digital multimeter?	12m, 7s	
9. Some intuition about the voltage drop across an element	14m, 55s	
10. What the heck is measurement polarity?	13m, 25s	
11. How do we measure current using a digital multimeter?	7m, 55s	
12. Measuring circuit variables: Example 1	15m, 33s	

Linear-Systems Project: Part 2

[Basic Concepts in Circuit Analysis, Part 1](#)

(6 Videos: 1h, 41m, 45s)

Video Title	Length	Complete
1. Measuring Circuit Variables: Example 3	17m, 35s	
2. Measuring Circuit Variables: Example 5	14m, 44s	
3. Parallel and Series Circuits	11m, 11s	
4. The Canonical Circuit Element	14m, 20s	
5. The Nodes of a Circuit	14m, 13s	
6. Measuring Circuit Variables: Example 7	29m, 42s	

Linear-Systems Project: Part 3

[Linear Algebraic Nodal Analysis: Example 2](#)

(16 Videos: 3h, 44m, 39s)

Video Title	Length	Complete
1. Linear Algebraic Nodal Analysis, Example 2: Circuit Model Verification	14m, 31s	
2. LANA Example 2, Step 1: Identify and label the entire set of nodes in our circuit	4m, 37s	
3. LANA Example 2, Step 2: Model the circuit as a directed graph	13m, 08s	
4. LANA Example 2, Step 3: Create the entire incidence matrix	7m, 43s	
5. LANA Example 2, Step 4: Create all circuit vectors	10m, 43s	
6. LANA Example 2, Step 5A: State the entire set of KVLs in node potential form	16m, 02s	
7. LANA Example 2, Step 5B: State the branch constitutive relations for the circuit	6m, 04s	
8. LANA Example 2, Step 5C: State the entire set of Kirchhoff's current laws	9m, 25s	
9. LANA Example 2, Step 6: Determine all ordinary and generalized nodes	18m, 1s	
10. LANA Example 2, Step 6 Extension Part 1	22m, 59s	
11. LANA Example 2, Step 6 Extension Part 2	22m, 55s	
12. LANA Example 2, Step 7: Ground the circuit	17m, 51s	
13. LANA Example 2, Step 8: State the grounded circuit equations	20m, 29s	
14. LANA Example 2, Step 9: Identify (non)essential nodes and supernodes	9m, 14s	
15. LANA Example 2, Step 10: Eliminate node dependencies from voltage sources	17m, 48s	
16. LANA Example 2, Step 11: State the maximally deflated circuit equation	13m, 02s	

Linear-Systems Project: Part 4 (Optional Extra Credit)

[Linear Algebraic Nodal Analysis: Example 2](#)

(4 Videos: 1h, 31m, 08s)

Video Title	Length	Complete
17. LANA Example 2, Step 11 Extension Part 1	20m, 02s	
18. LANA Example 2, Step 11 Extension Part 2	32m, 31s	
19. LANA Example 2, Step 11 Extension Part 3	14m, 57s	
20. LANA Example 2, Step 11 Extension Part 4	23m, 54s	

ENGR 11, Unit 3, Lesson 1:

[Unsigned Integers](#)

(14 Videos = 2 hour, 22 min, 21 sec)

Video Title	Length	Complete
0. How does integer division relate to the floor function?	20m, 24s	
1. What are unsigned integers?	6m, 36s	
2. What are unsigned decimal numbers?	31m, 12s	
3. What are unsigned binary numbers?	28m, 59s	
4. What are unsigned hexadecimal numbers?	19m, 53s	
5. How many digits do we need to represent unsigned integers?	34m, 24s	