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](https://thelearningcode.school.blog/2020/11/20/schedule-to-succeed-plan-to-fudge-it-up/) material. By systematically tracking your progress, you’ll build insights into that larger question.

# UNIT 1: INTRODUCTION TO PROGRAMMING IN MATLAB

[The MATLAB Desktop](https://www.youtube.com/playlist?list=PLSt7rwoPGTy39QURkLFlL-R_GSSHmmpmH) ENGR 11, Unit 1, Lesson 1 : 10 Videos = 2 hr, 35 min, 29 sec

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| --- | --- | --- |
| Video Title | Length | Complete |
| 1. [Engineering 11 Interview with Sydney Tomaneng](https://www.youtube.com/watch?v=CRaBl8qe-ME&list=PLSt7rwoPGTy39QURkLFlL-R_GSSHmmpmH&index=1) | 41m, 53s |  |
| 2. [Play with the MATLAB Desktop](https://www.youtube.com/watch?v=wGEtlUkeBI0) | 7m, 14s |  |
| 3. [How to show the virtual keyboard?](https://www.youtube.com/watch?v=TlytmQPwuoA) | 3m, 18s |  |
| 4. [How to use the command window in MATLAB?](https://www.youtube.com/watch?v=jfuosEaSCSg) | 9m, 27s |  |
| 5. [How to define variables in MATLAB?](https://www.youtube.com/watch?v=2YUAc70i9aQ) | 8m, 31s |  |
| 6. [How to perform basic arithmetic in MATLAB?](https://www.youtube.com/watch?v=RAJirGFkbaQ) | 13m, 05s |  |
| 7. [How to use MATLAB’s built-in functions?](https://www.youtube.com/watch?v=WJvISz66MzQ) | 20m, 53s |  |
| 8. [How to define scalar variables in MATLAB?](https://www.youtube.com/watch?v=Eel61AjZBT0) | 17m, 24s |  |
| 9. [What are the rules for MATLAB variable names?](https://www.youtube.com/watch?v=pCHUX_U7MFc) | 14m, 56s |  |
| 10. [How to manage variables in MATLAB’s Workspace?](https://www.youtube.com/watch?v=VFFDMEifhnA) | 18m, 44s |  |

[Script Files](https://youtube.com/playlist?list=PLSt7rwoPGTy0Spy0MOkG-4pL4QCbdyhjr) ENGR 11, Unit 1, Lesson 2 : 7 Videos = 2 hrs, 2 min, 25 sec

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| Video Title | Length | Complete |
| 1. [What is the MATLAB Toolstrip?](https://www.youtube.com/watch?v=tDklK9Pd3r0) | 13m, 43s |  |
| 2. [How to connect with MATLAB’s online community?](https://www.youtube.com/watch?v=ApQmm30fLQs) | 9m, 41s |  |
| 3. [What are MATLAB script files?](https://www.youtube.com/watch?v=WabyVijKE1I) | 27m, 15s |  |
| 4. [What are features of a good algorithm?](https://www.youtube.com/watch?v=Jvxqry9rkvQ) | 6m, 16s |  |
| 5. [How to draw flowchart diagrams?](https://www.youtube.com/watch?v=IFg10DtV2yY) | 13m, 23s |  |
| 6. [How do I comment my MATLAB script files?](https://www.youtube.com/watch?v=Xn7s9Zu91Dg)  | 15m, 23s |  |
| 7. [How to change current folder in Command Window](https://www.youtube.com/watch?v=lJU5cRLMQcc) | 30m, 07s |  |
| 8. [How to save time when documenting your code?](https://www.youtube.com/watch?v=kjgwJ-Pb5fs) | 6m, 30s |  |

[Create Arrays](https://www.youtube.com/playlist?list=PLSt7rwoPGTy3KzE0Xgsya5o2XfJNbZkFQ) ENGR 11, Unit 1, Lesson 3 : 6 Videos = 1 hr, 27 min, 33 sec

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| Video Title | Length | Complete |
| 1. [How to create column vectors in MATLAB?](https://www.youtube.com/watch?v=3merem0vz5Q) | 10m, 28s |  |
| 2. [How to create row vectors in MATLAB?](https://www.youtube.com/watch?v=h3jCvRgEqaY) | 8m, 22s |  |
| 3. [How to create row vectors using the colon operator?](https://www.youtube.com/watch?v=QMMZPUwd14Q) | 13m, 49s |  |
| 4. [How to create row vectors the using linspace function](https://www.youtube.com/watch?v=l76oqpksBQQ) | 18m, 01s |  |
| 5. [How to define matrices in MATLAB?](https://www.youtube.com/watch?v=kzngL5RJCyM) | 17m, 49s |  |
| 6. [How to address individual entries of a matrix?](https://www.youtube.com/watch?v=JQxRunDmlo0) | 18m, 49s |  |

[Play with Arrays](https://youtube.com/playlist?list=PLSt7rwoPGTy1rVoiCXFU5fpB38Q7a7ISE) ENGR 11, Unit 1, Lesson 4 : 6 Videos = 1 hr, 31 min, 38 sec

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| Video Title | Length | Complete |
| 1. [How to use colon notation to address arrays](https://www.youtube.com/watch?v=TV20k8ecEl0) | 24m, 49s |  |
| 2. [How to create zeros, ones, or identity matrices?](https://www.youtube.com/watch?v=xi7bTcJg8Ys) | 6m, 57s |  |
| 3. [How to use the transpose operator](https://www.youtube.com/watch?v=6HoIOfYBbxg) | 15m, 37s |  |
| 4. [How to add or delete entries in an existing matrix](https://www.youtube.com/watch?v=eaCsHd-XE6U) | 8m, 34s |  |
| 5. [How to define block matrices](https://www.youtube.com/watch?v=_6WVTIdmcis) | 17m, 43s |  |
| 6. [What are built-in functions for handling matrices?](https://www.youtube.com/watch?v=Rvy-R1gEAZM) | 17m, 53s |  |

[Logical Data](https://youtube.com/playlist?list=PLSt7rwoPGTy2jM0HTYnkuUplnTi7A3w4G) ENGR 11, Unit 1, Lesson 5 : 8 Videos = 1 hr, 34 min, 14 sec

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| Video Title | Length | Complete |
| 1. [What is the logical data class?](https://www.youtube.com/watch?v=8m8uOHyedVE) | 18m, 47s |  |
| 2. [What is a logical scalar?](https://www.youtube.com/watch?v=IlGveBvR1EY) | 7m, 41s |  |
| 3. [What is a logical vector?](https://www.youtube.com/watch?v=rkznI-FJ6x0) | 11m, 55s |  |
| 4. [What is a logical matrix?](https://www.youtube.com/watch?v=blYKbodvBj8) | 7m, 10s |  |
| 5. [How can we accurately refer to the size of logical data?](https://www.youtube.com/watch?v=KClwIb3f4T4) | 4m, 27s |  |
| 6. [What is the logical NOT operator?](https://www.youtube.com/watch?v=3hpNXSLqoZM) | 10m, 03s |  |
| 7. [What is the logical AND operator?](https://www.youtube.com/watch?v=pY6jSqn2QyE) | 19m, 15s |  |
| 8. [What is the logical OR operator?](https://www.youtube.com/watch?v=pr9ETk1_GSk) | 14m, 48s |  |

[Logical Play](https://youtube.com/playlist?list=PLSt7rwoPGTy3VWLn4WTgsfaq6MTA03TQo) ENGR 11, Unit 1, Lesson 6 : 11 Videos = 1 hr, 33 min, 42 sec

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| Video Title | Length | Complete |
| 1. [What is the form of a logical operator?](https://www.youtube.com/watch?v=nj4ZcJ60xX4) | 10m, 58s |  |
| 2. [What are compatible sizes for logical operators?](https://www.youtube.com/watch?v=EFtpHnAdmWQ) | 18m, 43s |  |
| 3. [What is the logical XOR operator?](https://www.youtube.com/watch?v=ML4isA-iO8Y) | 9m, 21s |  |
| 4. [How to combine logical operations?](https://www.youtube.com/watch?v=vrwdTRWdtUw) | 8m, 22s |  |
| 5. [What are equivalent propositions?](https://www.youtube.com/watch?v=vHRjx-ztKa0) | 6m, 31s |  |
| 6. [What are relational operations?](https://www.youtube.com/watch?v=6IWZ7dz_hDI) | 11m, 43s |  |
| 7. [How to test for equality?](https://www.youtube.com/watch?v=Ei-xeeySTgI) | 9m, 57s |  |
| 8. [How to test inequality relationships?](https://www.youtube.com/watch?v=qsQFaufaeWA) | 4m, 59s |  |
| 9. [How to use the isa function?](https://www.youtube.com/watch?v=Q9LOQT5b9bw) | 12m, 59s |  |
| 10. [What are special logical operators?](https://www.youtube.com/watch?v=UfTG5kYeXEs) | 9m, 13s |  |
| 11. [How to test the state of MATLAB entities?](https://www.youtube.com/watch?v=-ELjyadzd5A) | 4m, 22s |  |
| 12. [How does logical indexing work?](https://www.youtube.com/watch?v=u8zk0bgKVkA) | 6m, 55s |  |

[For Loops](https://www.youtube.com/watch?v=ZLI9HytbMII&list=PLSt7rwoPGTy2z6VUOFHHgCsyW9QdyAkQA) ENGR 11, Unit 1, Lesson 7 : 5 Videos = 1 hr, 16 min, 23 sec

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| Video Title | Length | Complete |
| 1. [How to use for loops in MATLAB?](https://www.youtube.com/watch?v=ZLI9HytbMII) | 25m, 15s |  |
| 2. [How to use for loops with vectors?](https://www.youtube.com/watch?v=myxRE6mj0ik) | 18m, 30s |  |
| 3. [How to code a dot product algorithm?](https://www.youtube.com/watch?v=CXb7TSZlPRY) | 7m, 12s |  |
| 4. [How to code scalar-vector multiplication?](https://www.youtube.com/watch?v=ZOU2ndjFWTE) | 12m, 56s |  |
| 5. [How to code an axpy operation?](https://www.youtube.com/watch?v=Xe46nF3s_Mo) | 12m, 25s |  |

[If Statements](https://www.youtube.com/playlist?list=PLSt7rwoPGTy3tvYAPJMAWtyF7LYtJ6fdh) Engr 11, Unit 1, Lesson 8 : 4 Videos = 1 hr, 17 min, 30 sec

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| Video Title | Length | Complete |
| 1. [How to write an if statement?](https://www.youtube.com/watch?v=Wf9vykWXJn0) | 25m, 11s |  |
| 2. [How to write an if/else statement?](https://www.youtube.com/watch?v=UeId6Qe9Bx0) | 28m, 53s |  |
| 3. [How to use if, elseif, else statements?](https://www.youtube.com/watch?v=CctB0JTbF8Y) | 12m, 43s |  |
| 4. [What is logical short circuiting?](https://www.youtube.com/watch?v=-3489Qu0_IY) | 10m, 39s |  |

[Function Files](https://www.youtube.com/playlist?list=PLSt7rwoPGTy3bPUiW8g5DN5mWmiEoMCTd) ENGR 11, Unit 1, Lesson 9 : 3 Videos = 1 hr, 50 min, 44 sec

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| --- | --- | --- |
| Video Title | Length | Complete |
| 1. [What are function files?](https://www.youtube.com/watch?v=Ikev2_Dw7jw)  | 29m, 19s |  |
| 2. [How to code a scalar-vector multiplication function?](https://www.youtube.com/watch?v=5Fx4sjwJGoo) | 47m, 44s |  |
| 3. [How to code a function that copies one vector into another?](https://www.youtube.com/watch?v=DEY17qdjMcY) | 33m, 41 |  |

# UNIT 2: MATRIX OPERATIONS

[Step 1 of Program Development](https://www.youtube.com/watch?v=D_8BSYs-kc0&list=PLSt7rwoPGTy3ozYdJIbNzmGKJR5akO7oO) ENGR 11, Unit 2, Lesson 1 : 9 Videos = 1 hr, 51 min, 13 sec

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| Video Title | Length | Complete |
| 1. [The Program Development Process](https://www.youtube.com/watch?v=D_8BSYs-kc0) | 10m, 16s |  |
| 2. [How to do matrix column vector multiplication using linear combinations](https://www.youtube.com/watch?v=dqD1NJpO_WE) | 18m, 51s |  |
| 3. [Example of matrix column vector multiplication using linear combinations](https://www.youtube.com/watch?v=AtiOM9gailk) | 14m, 25s |  |
| 4. [How to do matrix column vector multiplication using dot products?](https://www.youtube.com/watch?v=VQ6rlUu9MTw) | 14m, 57s |  |
| 5. [Example of matrix column vector multiplication using dot products](https://www.youtube.com/watch?v=K_N7bsJh7bc) | 12m, 36s |  |
| 6. [How to do row vector matrix multiplication using linear combinations](https://www.youtube.com/watch?v=QYusQSFWiG0) | 12m, 08s |  |
| 7. [Example of row-vector matrix-multiplication using linear combinations](https://www.youtube.com/watch?v=FZvp6-ESwjE) | 11m, 27s |  |
| 8. [How to do row-vector-matrix multiplication using dot products](https://www.youtube.com/watch?v=wmanefe3kBQ) | 13m, 29s |  |
| 9. [Example of row-vector-matrix-multiplication using dot products](https://www.youtube.com/watch?v=DofWhxdqyL0) | 13m, 15s |  |

[Steps 2 and 3 of Program Development](https://youtube.com/playlist?list=PLSt7rwoPGTy3s8m8xuUsckTP6xdsnhslf) ENGR 11, Unit 2, Lesson 2 : 6 Videos = 1 hr, 46 min, 44 sec

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| Video Title | Length | Complete |
| 1. [What is the relationship between matrix-vector multiplication and matrix partitions?](https://www.youtube.com/watch?v=dEFlXJdeqVg) | 9m, 28s |  |
| 2. [Do we really need four types of matrix vector multiplication](https://www.youtube.com/watch?v=7VidSUyR6Do) | 25m, 34s |  |
| 3. [How to code matrix-column-vector multiplication using axpy operations?](https://www.youtube.com/watch?v=CV05wLmdal0) | 20m, 45s |  |
| 4. [How to code matrix-column-vector multiplication using dot products?](https://www.youtube.com/watch?v=7gl5J3jMNjA) | 17m, 10s |  |
| 5. [How to code row-vector-matrix multiplication using linear combinations?](https://www.youtube.com/watch?v=2YV7rMIinBo) | 17m, 16s |  |
| 6. [How to code row-vector-matrix multiplication via dot products?](https://www.youtube.com/watch?v=ZX2QRSwoQKs) | 16m, 23s |  |

[Steps 4 of Program Development](https://youtube.com/playlist?list=PLSt7rwoPGTy3yzpbZe8z0BIm7UbpWqYpX) ENGR 11, Unit 2, Lesson 3 : 7 Videos = 2 hour, 10 min, 49 sec

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| Video Title | Length | Complete |
| 1. [Towards creating a general matrix-vector multiplication function](https://www.youtube.com/watch?v=BwcBT85SHJU) | 12m, 36s |  |
| 2. [Produce specifications for general matrix-vector multiplication function](https://www.youtube.com/watch?v=_xyIQWbC4kg) | 11m, 42s |  |
| 3. [Document our general matrix-vector multiplication function](https://www.youtube.com/watch?v=AvPMhpGw3N4) | 10m, 17s |  |
| 4. [How to code a function for general matrix-vector multiplication?](https://www.youtube.com/watch?v=tnXOdsgPN38) | 43m, 25s |  |
| 5. [How to code an outer product operation?](https://www.youtube.com/watch?v=4fOEn1DZCgs) | 18m, 33s |  |
| 6. [How to code matrix-matrix addition?](https://www.youtube.com/watch?v=AQ6lZhWoxSQ) | 9m, 25s |  |
| 7. [How to code a rank-1 update?](https://www.youtube.com/watch?v=wbPOD4c9AGg) | 10m, 41s |  |

# UNIT 3: INTRODUCTION TO NUMERICAL ANALYSIS

[Unsigned Integers](https://youtube.com/playlist?list=PLSt7rwoPGTy1yAImwYwlL46DqaH8AOhZH) ENGR 11, Unit 3, Lesson 1: 7 Videos = 3 hour, 01 min, 27 sec

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| Video Title | Length | Complete |
| 0. [How does integer division relate to the floor function?](https://www.youtube.com/watch?v=kqtt8jGzJRc) | 20m, 24s |  |
| 1. [What are unsigned integers?](https://www.youtube.com/watch?v=HUWwU5sjBj0) | 6m, 36s |  |
| 2. [What are unsigned decimal numbers?](https://www.youtube.com/watch?v=yJA0P68QxvQ) | 31m, 12s |  |
| 3. [What are unsigned binary numbers?](https://www.youtube.com/watch?v=Ki3CyTSgwGQ) | 28m, 59s |  |
| 4. [What are unsigned hexadecimal numbers?](https://www.youtube.com/watch?v=CBmHocmSDfg) | 19m, 53s |  |
| 5. [How many digits do we need to represent unsigned integers?](https://www.youtube.com/watch?v=lbv6EVj6BEk) | 34m, 24s |  |
| 6. [How does the floor function relate to integer division?](https://www.youtube.com/watch?v=kqtt8jGzJRc&list=PLSt7rwoPGTy1yAImwYwlL46DqaH8AOhZH&index=6) | 20m, 25s |  |
| 7. [Convert an integer from decimal to binary](https://www.youtube.com/watch?v=riMxBqEvi8s&list=PLSt7rwoPGTy1yAImwYwlL46DqaH8AOhZH&index=7) | 39m, 52s |  |

# APPLIED PROJECT 1: LINEAR ALGEBRAIC NODAL ANALYSIS

[Introduction to the Electronics Learning Laboratory Kit](https://www.youtube.com/playlist?list=PLSt7rwoPGTy3AiRIUGxesVeg-HHEYc9QZ) Applied Project 1, Part 1: 12 Videos = 2 hr, 5min, 3sec

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| Video Title | Length | Complete |
| 1. [Intro to Linear Algebraic Nodal Analysis Algorithm](https://youtu.be/R05zS0jlgTE)  | 2m, 19s |  |
| 2. [The Electronics Learning Lab Kit](https://youtu.be/OFzozmpSaX8)  | 6m, 14s |  |
| 3. [What is a Solderless Breadboard?](https://youtu.be/sJ72h7Cubxk) | 13m, 23s |  |
| 4. [Introduction to Resistors](https://youtu.be/enbhIJwCEfI) | 13m, 56s |  |
| 5. [Introduction to DC Voltage Sources](https://youtu.be/8RzyCJ4smQ4) | 10m, 5s |  |
| 6. [Introduction to DC Current Sources](https://youtu.be/5BvSCfqUa44) | 6m, 6s |  |
| 7. [Our first circuit with a resistor and dc voltage source](https://youtu.be/3QrSn1TWCUk) | 9m, 25s |  |
| 8. [How do we measure the voltage drop using a DMM?](https://youtu.be/Vm6g8SZrrE8) | 12m, 7s |  |
| 9. [Some intuition about the voltage drop across an element](https://youtu.be/6pZOvRYU9ws) | 14m, 55s |  |
| 10. [What the heck is measurement polarity?](https://youtu.be/29ghHGeN58o) | 13m, 25s |  |
| 11. [How do we measure current using a DMM?](https://youtu.be/rtAC-znQ1qE) | 7m, 55s |  |
| 12. [Measuring circuit variables: Example 1](https://youtu.be/7aSRQ68FQaI) | 15m, 33s |  |

[Basic Concepts in Circuit Analysis, Part 1](https://www.youtube.com/playlist?list=PLSt7rwoPGTy3_hJQHfFfwEzAJsmZIkXCA) Applied Project 1, Part 2 : 6 Videos = 1hr, 41min, 45sec

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| Video Title | Length | Complete |
| 1. [Measuring Circuit Variables: Example 3](https://youtu.be/rqBD7svo8Ew) | 17m, 35s |  |
| 2. [Measuring Circuit Variables: Example 5](https://youtu.be/1NMsDn1Rdjg) | 14m, 44s |  |
| 3. [Parallel and Series Circuits](https://youtu.be/qSVL4h6bVQ0) | 11m, 11s |  |
| 4. [The Canonical Circuit Element](https://youtu.be/hrr4gng87lI) | 14m, 20s |  |
| 5. [The Nodes of a Circuit](https://youtu.be/oaW-Zk19m5Q) | 14m, 13s |  |
| 6. [Measuring Circuit Variables: Example 7](https://youtu.be/5tEZJRCf4fQ) | 29m, 42s |  |

[Linear Algebraic Nodal Analysis: Example 2](https://www.youtube.com/playlist?list=PLSt7rwoPGTy3oR1622D-kgWIQvIMPg3sS) Applied Project 1, Part 3A : 16 Videos = 3hr, 44min, 39sec

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| --- | --- | --- |
| Video Title | Length | Complete |
| 1. [Linear Algebraic Nodal Analysis, Example 2: Circuit Model Verification](https://youtu.be/t3QL8KTcga0) | 14m, 31s |  |
| 2. [LANA Example 2, Step 1: Identify and label the entire set of nodes in our circuit](https://youtu.be/ABfvvq8NrDU) | 4m, 37s |  |
| 3. [LANA Example 2, Step 2: Model the circuit as a directed graph](https://youtu.be/aCu8avtPVDE) | 13m, 08s |  |
| 4. [LANA Example 2, Step 3: Create the entire incidence matrix](https://youtu.be/yYp5ds_TNKY) | 7m, 43s |  |
| 5. [LANA Example 2, Step 4: Create all circuit vectors](https://youtu.be/HcT9HtRDr0U) | 10m, 43s |  |
| 6. [LANA Example 2, Step 5A: State the entire set of KVLs in node potential form](https://youtu.be/iRIFrzJdkVE) | 16m, 02s |  |
| 7. [LANA Example 2, Step 5B: State the branch constitutive relations for the circuit](https://youtu.be/Nkbks715qxM) | 6m, 04s |  |
| 8. [LANA Example 2, Step 5C: State the entire set of Kirchhoff’s current laws](https://youtu.be/EOrdMdz0CnU) | 9m, 25s |  |
| 9. [LANA Example 2, Step 6: Determine all ordinary and generalized nodes](https://youtu.be/ot76Jn1PTbg) | 18m, 1s |  |
| 10. [LANA Example 2, Step 6 Extension Part 1](https://youtu.be/tia14a6Ho6w) | 22m, 59s |  |
| 11. [LANA Example 2, Step 6 Extension Part 2](https://youtu.be/4ASj2ZhvxmY) | 22m, 55s |  |
| 12. [LANA Example 2, Step 7: Ground the circuit](https://youtu.be/j10iZY0QLQ4) | 17m, 51s |  |
| 13. [LANA Example 2, Step 8: State the grounded circuit equations](https://youtu.be/EsQGa8GI17U) | 20m, 29s |  |
| 14. [LANA Example 2, Step 9: Identify (non)essential nodes and supernodes](https://youtu.be/PX39ylJyb4I) | 9m, 14s |  |
| 15. [LANA Example 2, Step 10: Eliminate node dependencies from voltage sources](https://youtu.be/-82zUcc2o4Q) | 17m, 48s |  |
| 16. [LANA Example 2, Step 11: State the maximally deflated circuit equation](https://youtu.be/jb1ZA8iLceM) | 13m, 02s |  |

Linear Algebraic Nodal Analysis: Example 3 Applied Project 1, Part 4 : N Videos = H hour, MM min, SS sec

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| Video Title | Length | Complete |
| 1. [LANA Example 2, Step 11 Extension Part 1](https://youtu.be/6EEqFfxNX1E) | 20m, 02s |  |
| 2. [LANA Example 2, Step 11 Extension Part 2](https://youtu.be/EndDkGPuvQo) | 32m, 31s |  |
| 3. [LANA Example 2, Step 11 Extension Part 3](https://youtu.be/l6oORUkoh7c) | 14m, 57s |  |
| 4. [LANA Example 2, Step 11 Extension Part 4](https://www.youtube.com/watch?v=5FOY6tDIVTE) | 23m, 54s |  |

[Linear Algebraic Nodal Analysis: Example 2 Extention Videos](https://youtube.com/playlist?list=PLSt7rwoPGTy06KqgMb5c3mu2ggrG1VWqH) Applied Project 1, Part 5 : 4 Videos = 1hr, 31min, 08sec

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| Video Title | Length | Complete |
| 1. [LANA Example 2, Step 11 Extension Part 1](https://youtu.be/6EEqFfxNX1E) | 20m, 02s |  |
| 2. [LANA Example 2, Step 11 Extension Part 2](https://youtu.be/EndDkGPuvQo) | 32m, 31s |  |
| 3. [LANA Example 2, Step 11 Extension Part 3](https://youtu.be/l6oORUkoh7c) | 14m, 57s |  |
| 4. [LANA Example 2, Step 11 Extension Part 4](https://www.youtube.com/watch?v=5FOY6tDIVTE) | 23m, 54s |  |