

**NORCO COLLEGE  
SLO to PLO MATRIX**

**PLOs**

		PLO 1 Fluently read and write electronic symbols of schematics, and develop schematic diagrams to guide the simulation, construction, troubleshooting and repair of DC, AC and digital & microcontroller circuits.	PLO 2 Explain the operation of electronic components and predict their behavior in given circuits, and calculate solutions to complex networks, and justify the formulas and calculations.	PLO 3 Capture a schematic of a mixed-signals circuit, using MultiSim® CAD software, and simulate the behavior of it, and then create a PCB design for that circuit. Then, after fabrication of a Printed Circuit Board (PCB), "stuff" and solder components to it, test and contrast with simulation predictions.	PLO 4 Fluently read and write Boolean logic equations, symbols, truth-tables and circuits, then synthesize logic forms, simplify to lowest terms, and implement circuits using only NAND or NOR logic gates.	PLO 5 Design, program, compile, install, wire, test, verify and explain the proper operation of a microcontroller with respect to given specs, then explain the use of the microcontroller to perform math logic or conversions between analog and digital forms	
<b>CERTIFICATE/PROGRAM:</b> Digital Electronics							
<b>COURSE:</b> ELE-11 DC Electronics							
SLO 1	Solve basic, direct current, electronic problems involving resistance, current, voltage, and power, as applied to both simple and complex combinations of series and/or parallel circuit components, comprised of resistors, capacitors and coils, in a given network configuration.	1,2	1,2				
SLO 2	Diagram and discuss the relationship between electricity and magnetism as related to a DC permanent magnet motor, a solenoid or an electromechanical relay.	1,2	1,2				
SLO 3	Describe and contrast the construction, operation, and purpose of resistors, potentiometers, switches, fuses, relays, and batteries.	1,2	1,2				
<b>COURSE:</b> ELE-13 AC Electronics							
SLO 1	Explain the basic principles of sinusoidal sources of Alternating Current (AC) and solve AC network circuit problems, involving resistors, capacitors, inductors and/or transformers.	1,2,3	1,2,3				
SLO 2	Discuss the purpose and effects of resistors, capacitors, inductors and/or transformers in a given AC network problem, analyze it and diagram the solution to a posed problem by using J-Factors appropriately and accurately.	1,2,3	1,2,3,4				
SLO 3	Take meter and O-scope measurements of a given AC network of components and display and document the results, comparing and contrasting those measurements with predictions that you calculated before-hand. Explain the similarities and/or differences.	1,2,3	1,2,3,4				
<b>COURSE:</b> ELE-25 Digital techniques							
SLO 1	Convert between the binary and decimal number systems and recognize the most commonly used binary codes.	1,2,3	1,2,3		1,2,3,4		
SLO 2	Explain the operation of digital logic gates.	1,2,3	1,2,3		1,2,3,4		

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SLO 3	Identify the more commonly used integrated circuit families used in digital equipment and discuss their operation and characteristics.	1,2,3	1,2,3				1,2,3	
SLO 4	Use Boolean algebra to express logic operations and minimize logic circuits in design.	1,2,3	1,2,3				1,2,3,4	
SLO 5	Discuss the operation and application of counters, shift registers, and other sequential and combinational logic circuits.	1,2,3	1,2,3				1,2,3	
<b>COURSE: ELE-26 Microprocessors, Microcontrollers</b>								
SLO 1	Explain the basic operation of a microprocessor / microcontroller.	1,2,3	1,2,3					1,2,3,4
SLO 2	Describe and control input and output operations.	1,2,3	1,2,3					1,2,3,4
SLO 3	Develop a flowchart to define a problem.	1,2,3	1,2					1,2,3
SLO 4	Develop a flowchart to solve a problem.	1,2,3	1,2					1,2,3
<b>COURSE: ELE-27 Technical Communications</b>								
SLO 1	Define technical communications		1					
SLO 2	Recognize and identify characteristics of technical communications	1,2,3	1					
SLO 3	Identify the needs of a given audience		1					
SLO 4	Collect and organize information	1,2,3	1,2,3					1,2,3
SLO 5	Create technical documents in accordance with conventional formats	1,2,3	1,2,3					1,2,3
SLO 6	Write descriptive and operational instructions for nontechnical users of technical information		1,2					1,2,3,4
SLO 7	Properly integrate graphs, tables, and references into technical reports	1,2,3	1,2					1,2,3
SLO 8	Conduct an informational interview							
SLO 9	Assemble a personal data book; and		1					
SLO 10	Compose a personal resume with cover letter.							

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<b>COURSE:</b>	<b>ELE-28 MultiSim CAD &amp; PCB Design/Fab</b>					
SLO 1	Demonstrate knowledge of electronic schematics and systems, using CAD tools for design, schematic capture, circuit simulation and documentation, including bill of materials and net-lists	1,2,3,4	2,3	1, 2		
SLO 2	Layout example circuits for subsequent printed circuit board design.	3,4	2,3	3,4		
SLO 3	Design and document electronic circuit schematics and printed circuit boards, using CAD tools, for both "through-hole" and surface-mount technology (SMT).	1,2,3,4	2,3	3,4		
<b>NOTE1:</b>	<b>Future addition of an PLO-6 would balance ELE-27 resume writing &amp; interviewing SLOs with "Preparation for the workforce."</b>					
<b>NOTE2:</b>	<b>LEGEND to entries in this overall SLO to PLO matrix:</b>					
	1=Introduce					
	2=Develop					
	3=Demonstrate Skill					
	4=Master					