

INDUSTRY AND TECHNOLOGY
Institutional (ILO), Program (PLO), and Course (SLO) Alignment

Program: Electronics and Computer Hardware Technology	Number of Courses: 16	Date Updated: 09.18.2014	Submitted by: SueEllen Warren, ext. 4519 Renee Newell, ext. 3308
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ILOs	1. Critical Thinking <i>Students apply critical, creative and analytical skills to identify and solve problems, analyze information, synthesize and evaluate ideas, and transform existing ideas into new forms.</i>	2. Communication <i>Students effectively communicate with and respond to varied audiences in written, spoken or signed, and artistic forms.</i>	3. Community and Personal Development <i>Students are productive and engaged members of society, demonstrating personal responsibility, and community and social awareness through their engagement in campus programs and services.</i>	4. Information Literacy <i>Students determine an information need and use various media and formats to develop a research strategy and locate, evaluate, document, and use information to accomplish a specific purpose. Students demonstrate an understanding of the legal, social, and ethical aspects related to information use.</i>
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SLO-PLO-ILO ALIGNMENT NOTES:

Mark boxes with an 'X' if: SLO/PLO is a major focus or an important part of the course/program; direct instruction or some direct instruction is provided; students are evaluated multiple times (and possibly in various ways) throughout the course or are evaluated on the concepts once or twice within the course.

DO NOT mark with an 'X' if: SLO/PLO is a minor focus of the course/program and some instruction is given in the area but students are not formally evaluated on the concepts; or if the SLO/PLO is minimally or not at all part of the course/program.

PLOs	PLO to ILO Alignment <i>(Mark with an X)</i>			
	1	2	3	4
PLO #1 Safely Operating Industry Equipment Upon successful completion of this program, students will be able to identify and safely operate/manipulate various types of electronic hand tools and test equipment.	X	X	X	
PLO #2 Using industry Level Skills Upon successful completion of this program, students will be able to, accurately identify and analyze various types of Electronic/Electrical Circuits using both calculations, simulation, and test and measurements.	X	X		X
PLO #3 Using Industry Reporting and Analysis Protocols Upon successful completion of this program, students will be able to incorporate data and analysis reporting protocols, using either "paper" or "paperless" environments, similar to data reporting and analysis used by many Electronics Manufacturers and Service Organizations.	X	X		X

SLOs	SLO to PLO Alignment <i>(Mark with an X)</i>			COURSE to ILO Alignment <i>*FOR OFFICE USE ONLY*</i>			
	P1	P2	P3	1	2	3	4
ECHT 11 Introduction to Electronics: SLO #1 Measuring Voltages and Currents Measuring Voltage and Current The student will make basic “in-circuit” measurements: Alternating Current/Direct Current (AC/DC), Voltages and Currents, and Resistance, using both a Bench and Portable Digital Multimeter (DMM).	X	X	X				
ECHT 11 Introduction to Electronics: SLO #2 Experimental Data and Analysis Reporting The students will be able to incorporate experimental data and analysis reporting protocols, using either “paper” or “paperless” environments, similar to data reporting and analysis used by many Electronics Manufacturers and Service Organizations.	X	X	X	X	X	X	X
ECHT 11 Introduction to Electronics: SLO #3 Circuit Analysis Calculations The students will be able to use various circuit analysis calculations to predict basic circuits operation.		X	X				
ECHT 110 Introduction to Direct and Alternating Current Circuits: SLO #1 Measuring Voltage, Current & Resistance The student will make advanced “in- circuit” measurements : Alternating Current/Direct Current (AC/DC), Voltages, Currents, and Resistance, using both a Bench and Portable Digital Multimeter (DMM).	X	X	X				
ECHT 110 Introduction to Direct and Alternating Current Circuits: SLO #2 Direct & Alternating Currents The student will use an Electronic Simulation Software Package similar to Multi-SIM or “P” Spice to supplement both the understanding and analysis of Direct and Alternating Current Circuits.	X	X	X	X	X	X	X
ECHT 110 Introduction to Direct and Alternating Current Circuits: SLO #3 Circuit Analysis Calculations The students will be able to use various circuit analysis calculations to predict basic circuits operation.		X	X				
ECHT 120 Semiconductor Circuits I: SLO #1 In-Circuit Measurements The student will make basic “in-circuit” measurements using Bench and Portable Digital Multimeter (DMM), Oscilloscope, and Voltage Ohm (VOM), Milliamp Meter on Solid-State Systems.		X	X				
ECHT 120 Semiconductor Circuits I: SLO #2 Experimental Data and Analysis Reporting The student will be able to use various circuit analysis calculations to predict basic circuit operation.	X	X	X	X	X	X	X
ECHT 120 Semiconductor Circuits I: SLO #3 Advanced In-Circuit Measurements The student will make advanced “in-circuit” measurements using Bench and Portable Digital Multimeter (DMM), Oscilloscope, and Voltage Ohm (VOM), Milliamp Meter on Solid-State-Systems.	X	X	X				

SLOs	SLO to PLO Alignment <i>(Mark with an X)</i>			COURSE to ILO Alignment <i>*FOR OFFICE USE ONLY*</i>			
	P1	P2	P3	1	2	3	4
ECHT 122 Semiconductor Circuits II: SLO #1 Measuring Voltages and Currents Measuring Voltage and Current The student will make basic “in-circuit” measurements: Alternating Current/Direct Current (AC/DC), Voltages and Currents, and Resistance, using both a Bench and Portable Digital Multimeter (DMM).	X	X	X	X	X	X	X
ECHT 122 Semiconductor Circuits II: SLO #2 Field Effect Amplifier Given a schematic diagram of a basic Field Effect Amplifier, the students will be able to assemble, test and measure the circuit for its operational parameters.		X	X				
ECHT 122 Semiconductor Circuits II: SLO #3 Experimental Data and Analysis Reporting The students will be able to incorporate experimental data and analysis reporting protocols, using either “paper” or “paperless” environments, similar to data reporting and analysis used by many Electronics Manufacturers and Service Organizations.		X	X				
ECHT 124 Operational Amplifiers and Linear Integrated Circuits: SLO #1 Operational Amplifier Given a schematic diagram of a basic Operational Amplifier (Op) with negative feedback, the students will be able to assemble, test and measure the circuit for its operational parameters.	X	X	X	X	X	X	X
ECHT 124 Operational Amplifiers and Linear Integrated Circuits: SLO #2 Advanced In-Circuit Measurements The student will make advanced “in-circuit” measurements using Bench and Portable Digital Multimeter (DMM), Oscilloscope, and Voltage Ohm (VOM), Milliamp Meter, on Advanced Solid-State-Systems.		X	X				
ECHT 124 Operational Amplifiers and Linear Integrated Circuits: SLO #3 Experimental Data and Analysis Reporting The students will be able to incorporate experimental data and analysis reporting protocols, using either “paper” or “paperless” environments, similar to data reporting and analysis used by many Electronics Manufacturers and Service Organizations.		X	X				
ECHT 130 Digital Systems and Computer Logic I: SLO #1 DeMorgan’s Theorem The student will use DeMorgan’s Theorem to reduce a Boolean Statement in its simplest terms.		X	X	X	X	X	X
ECHT 130 Digital Systems and Computer Logic I: SLO #2 Basic Function Gates The student will use discrete NOR and NAND Gates to construct all seven basic function gates (NOT, OR, NOR, AND, NAND, EXOR, and EXNOR).		X	X				
ECHT 130 Digital Systems and Computer Logic I: SLO #3 Experimental Data and Analysis Reporting The students will be able to incorporate experimental data and analysis reporting protocols, using either “paper” or “paperless” environments, similar to data reporting and analysis used by many Electronics Manufacturers and Service Organizations.		X	X				

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ECHT 140 Computer Systems and Hardware Technology I: SLO #1 Course Notebook The students will assemble and maintain a five-section course notebook.		X	X				
ECHT 140 Computer Systems and Hardware Technology I: SLO #Component Handling Techniques The student will be able to demonstrate their knowledge in proper component handling techniques, especially regarding (ESD), Electrostatic Discharge.	X	X	X	X	X	X	X
ECHT 140 Computer Systems and Hardware Technology I: SLO #3 Computer Estimate and Configuration The student will be able to demonstrate their ability to cost out and configure either a Business or "Gaming" Computer per customer specifications.		X	X				
ECHT 142 Computer Systems and Hardware Technology II: SLO #1 Course Notebook The students will assemble and maintain a five-section course notebook.		X	X				
ECHT 142 Computer Systems and Hardware Technology II: SLO #2 Troubleshooting Techniques The student will be able to demonstrate advanced skill levels in their knowledge of repairing computer systems using system troubleshooting techniques introduced within the scope of the class.	X	X	X	X	X	X	X
ECHT 142 Computer Systems and Hardware Technology II: SLO #3 OEM Specifications The student will be able to demonstrate their knowledge in using commercially available diagnostic tools to verify a system meets original equipment manufacturer (OEM) specifications.		X	X				
ECHT 144 CompTIA A+ Certification Preparation for Computer Hardware Systems: SLO #1 Course Notebook The students will assemble and maintain a five-section course notebook.		X	X				
ECHT 144 CompTIA A+ Certification Preparation for Computer Hardware Systems: SLO #2 CompTIA Industry Certification The student will acquire a knowledge base to prepare to take the A+ Certification Exam through CompTIA, an industry recognized certification.	X	X	X	X	X	X	X
ECHT 144 CompTIA A+ Certification Preparation for Computer Hardware Systems: SLO #3 Electricity & Electronics The student will acquire knowledge in safety and the basics of electricity and electronics, micro-computer hardware and components.		X	X				

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ECHT 146 CompTIA Network+ Certification Preparation for Computer Hardware Systems: SLO #1 Course Notebook The students will assemble and maintain a five-section course notebook.		X	X				
ECHT 146 CompTIA Network+ Certification Preparation for Computer Hardware Systems: SLO #2 CompTIA Network+ Certification Exam Students will develop the skills and knowledge required for passing the CompTIA Network+ Certification exam. Topics include set up configuration and troubleshooting of networking hardware devices. Other areas explored include networking topology, cabling, wireless devices, network standards, protocols and security.	X	X	X	X	X	X	X
ECHT 146 CompTIA Network+ Certification Preparation for Computer Hardware Systems: SLO #3 Open Systems Interconnection Students will demonstrate their knowledge of Open Systems Interconnection (OSI), the seven layers of the OSI model, protocol and data packets, and the standard network model.		X	X				
ECHT 148 CompTIA Security+ Certification Preparation for Computer Hardware Systems: SLO #1 Course Notebook The students will assemble and maintain a five-section course notebook.		X	X				
ECHT 148 CompTIA Security+ Certification Preparation for Computer Hardware Systems: SLO #2 Information Security Students will demonstrate their knowledge of information security, system threats and risks, protecting systems, network vulnerabilities, network defenses, wireless network security, security audits and policies, cryptographic methods, and the basics of computer forensics.	X	X	X	X	X	X	X
ECHT 148 CompTIA Security+ Certification Preparation for Computer Hardware Systems: SLO # Cybersecurity Students will demonstrate their knowledge of “Chain of Custody” handling procedures of physical evidence in matters of cybersecurity.		X	X				
ECHT 191 Introduction to Microprocessors and Interfacing: SLO #1 Machine Assembly Language Students will demonstrate their knowledge of fundamentals of machine assembly language.		X	X				
ECHT 191 Introduction to Microprocessors and Interfacing: SLO #2 Digital & Analog Interfacing Students will demonstrate their use of software to simulate hardware and digital and analog interfacing.		X	X	X	X		X
ECHT 191 Introduction to Microprocessors and Interfacing: SLO #3 Microprocessors and Microcontrollers Students will demonstrate their knowledge of microprocessors and microcontrollers as they relate to industrial and consumer equipment.		X	X				
ECHT 192 Robotics and Machine Control: SLO #1 Testing, Operating and Debugging After completing structured assignments that introduce basic concepts and applications, and of a Microcontroller/Microprocessor, the student use the information learned to successfully test, operate, program, and debug a Microcontroller/Microprocessor.		X	X	X	X		X

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ECHT 22 Basic Electronic Fabrication: SLO #1 Tools & Test Equipment Upon successful completion of this course, students will be able to identify and safely operate/manipulate various types of electronic hand tools and test equipment.	X	X		X	X	X	X
ECHT 22 Basic Electronic Fabrication: SLO #2 Experimental Data and Analysis Reporting The students will be able to incorporate experimental data and analysis reporting protocols, using either “paper” or “paperless” environments, similar to data reporting and analysis used by many Electronics Manufacturers and Service Organizations.	X		X				
ECHT 22 Basic Electronic Fabrication: SLO #3 Low Voltage Power Supply Upon successful completion of this course, students will be able to produce a functional low voltage, direct current (DC) power supply project sample that meets predetermined specifications and which could be potentially mass produced.		X	X				
ECHT 62 Introduction to the Electric Power Industry: SLO #1 Electrical Theory Students will demonstrate a basic knowledge of power generation, transmission, and basic electrical theory.		X		X	X		X
ECHT 64 Electric Power Industry Safety: SLO #1 OSHA Safety Exam Students will be able to successfully pass the examination for the OSHA (30 Hour) safety-training certificate.	X	X		X	X	X	X