

COURSE SLO ASSESSMENT 4-YEAR TIMELINE REPORT (ECC)

INDUSTRY AND TECHNOLOGY DIVISION - AIR CONDITIONING AND REFRIGERATION

Course SLO Assessment Cycle	Course ID	Course Name	Course SLO Title	Course SLO Statement
2013-14 (Spring 2014)	ECC: ACR 5	Electrical Applications	SLO #1 Troubleshooting Units	After reading the textbook and participating in class discussions, students will apply their knowledge of appropriate lab practices, concepts and theories by troubleshooting a faulty air conditioning unit with the use of a wiring schematic and voltmeter. After finding the problem they will run the unit and make sure it is operating at the manufacturer's specifications.
2013-14 (Spring 2014)	ECC: ACR 5	Electrical Applications	SLO #2 Simple Wiring Diagrams	After completion of this course students will have the basic skills necessary to read and interpret simple wiring diagrams in order to effectively troubleshoot and repair simple HVACR control and power related problems.
2013-14 (Spring 2014)	ECC: ACR 5	Electrical Applications	SLO #3 HVACR Systems and Components	Upon completion of this course, students will apply knowledge gained on diagrams and component operation to identify HVACR systems and components sequencing and operating conditions.
2013-14 (Spring 2014)	ECC: ACR 6	Refrigeration and Air Conditioning Control Systems	SLO #1 Electrical Control Relays	After reading the textbook and participating in class discussions, students will apply their knowledge of appropriate lab practices, concepts and theories by observing and testing the proper operation of an air conditioning electrical control relay.
2013-14 (Spring 2014)	ECC: ACR 6	Refrigeration and Air Conditioning Control Systems	SLO #2 Microprocessor Controls	Students completing this course will gain the knowledge necessary to perform basic testing of HVACR system microprocessor controls.
2013-14 (Spring 2014)	ECC: ACR 6	Refrigeration and Air Conditioning Control Systems	SLO #3 Ladder & Schematic Diagrams	Upon completion of this course students will apply the basic knowledge and skills learned to service and troubleshoot microprocessor controls using ladder and schematic diagrams.
2014-15 (Fall 2014)	ECC: ACR 20	Solar Energy Applications- Photovoltaics and Solar Thermal	SLO #1 Parts of Solar Thermal Units	After reading the textbook and participating in class discussions, students will apply their knowledge of appropriate lab practices, concepts and theories by naming the parts of a Solar Thermal unit in correct sequence and know how a Solar Thermal unit converts solar energy into hot water. Naming the parts of a Photovoltaic (PV) unit in correct sequence and know how a PV unit converts solar energy into electrical energy.
2014-15 (Fall 2014)	ECC: ACR 20	Solar Energy Applications- Photovoltaics and Solar Thermal	SLO #2 Solar Energy Application	Students completing this course will apply their knowledge to the proper application of solar energy and solar thermal systems.
2014-15 (Fall 2014)	ECC: ACR 20	Solar Energy Applications- Photovoltaics and Solar Thermal	SLO #3 Solar System Operation & Installation	After completing this course student will gain the basic skills necessary to evaluate solar systems operation and installation requirements.
2014-15 (Fall 2014)	ECC: ACR 21	Air Conditioning Fundamentals	SLO #1 Window Air Conditioning Manifold Gauges	After reading the textbook and participating in class discussions, students will apply their knowledge of appropriate lab practices, concepts and theories placing refrigeration manifold gauges on a window air conditioning unit and check for correct charge of an operating system based on the type of refrigerant used in the system.

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2014-15 (Fall 2014)	ECC: ACR 21	Air Conditioning Fundamentals	SLO #2 Component Brazing	After completion of this course, students will acquire the skills necessary to successfully braze refrigeration components to meet basic industry standards.
2014-15 (Fall 2014)	ECC: ACR 21	Air Conditioning Fundamentals	SLO #3 Basic HVACR Service	After completion of this course, students will have the knowledge necessary to perform basic HVACR service in a safe manner.
2014-15 (Spring 2015)	ECC: ACR 22	Basic Refrigeration	SLO #1 Refrigeration Manifold Gauges	After reading the textbook and participating in class discussions, students will apply their knowledge of appropriate lab practices, concepts and theories placing refrigeration manifold gauges on a refrigerator and check for the correct charge of an operating refrigerator based on the type of refrigerant used in the system.
2014-15 (Spring 2015)	ECC: ACR 22	Basic Refrigeration	SLO #2 Soldering & Brazing	After completion of this course, students will apply their knowledge to soldering and brazing to copper to copper and copper to steel components within the refrigeration system.
2014-15 (Spring 2015)	ECC: ACR 22	Basic Refrigeration	SLO #3 Tools of the Trade	Students completing this course will apply their knowledge to the proper use of tools of the HVACR trade.
2014-15 (Spring 2015)	ECC: ACR 23	Commercial Refrigeration Applications	SLO #1 Proper Freezer Temperatures	After reading the textbook and participating in class discussions, students will apply their knowledge of appropriate lab practices, concepts and theories to an operating low temperature walk-in freezer. Students will check proper freezer temperatures, amperage draw on the operating compressor, subcooling and superheat temperatures.
2014-15 (Spring 2015)	ECC: ACR 23	Commercial Refrigeration Applications	SLO #2 Special System Components	Students completing this course will apply their knowledge to the application, service and testing of special refrigeration system components.
2014-15 (Spring 2015)	ECC: ACR 23	Commercial Refrigeration Applications	SLO #3 Troubleshooting with Diagrams & Schematics	Students completing this course will apply their knowledge to service and troubleshooting using electrical diagrams and schematics specific to commercial refrigeration.
2015-16 (Fall 2015)	ECC: ACR 25	Energy Efficient Residential, Commercial and Industrial Air Conditioning	SLO #1 Taking Readings and Applying Data	After reading the textbook and participating in class discussions, students will apply their knowledge of appropriate lab practices, concepts and theories to an operating 2 ton 13 SEER Air Conditioning Package Unit. Students will take air temperature readings, compressor amperage draw, subcooling and superheat readings and apply the data to the appropriate lab exercise.
2015-16 (Fall 2015)	ECC: ACR 25	Energy Efficient Residential, Commercial and Industrial Air Conditioning	SLO #2 Human Senses Function Test	After reading the textbook and participating in classroom discussions, students will apply their knowledge of how to check an A/C unit by using their senses to see if it operating close to what it should be. Instruments and tools will determine if the A/C units are operating correctly. These are quick checks to see if a unit is not operating.
2015-16 (Fall 2015)	ECC: ACR 25	Energy Efficient Residential, Commercial and Industrial Air Conditioning	SLO #3 Charging an A/C Unit	After reading the textbook and participating in classroom discussions, students will apply their knowledge of how to properly charge an A/C unit.
2015-16 (Spring 2016)	ECC: ACR 27	Heating Technologies	SLO #1 High Efficiency Gas Furnaces	After reading the textbook and participating in class discussions, students will apply their knowledge of appropriate lab practices,

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				concepts and theories to an operating High Efficiency Gas Furnace. Students will take gas pressure readings with a manometer and record the readings with the appropriate lab assignment and compare the reading with manufacturer's specifications.
2015-16 (Spring 2016)	ECC: ACR 27	Heating Technologies	SLO #2 Strip-Heating System Ladder Diagram	After reading the textbook and participating in classroom discussions, students will apply their knowledge of electric strip-heating system. Students will draw a ladder diagram of an electric strip-heating system. They will collect and analyze data, and present the sequence of operations of the system.
2015-16 (Spring 2016)	ECC: ACR 27	Heating Technologies	SLO #3 HVAC Charging Checklist	After reading the textbook and participating in classroom discussions, students will apply their knowledge of air source heat pump systems to collect data on the unit using a HVAC charging checklist.
2016-17 (Fall 2016)	ECC: ACR 30	Electric Controls	SLO #1 Control Boards	After reading the textbook and participating in class discussions, students will apply their knowledge of appropriate lab practices, concepts and theories to an operating Air Conditioning Control Board. Students will check an A/C wire schematic for proper wiring of the board and energize the board taking electrical readings at each control device.
2016-17 (Fall 2016)	ECC: ACR 30	Electric Controls	SLO #2 Electrical Board Ladder Diagram, VOM Check	After reading the textbook and participating in classroom discussions, students will apply their knowledge to draw a ladder diagram from an electrical board that simulates an air conditioning system, know the parts of the air conditioning system and use a VOM to check each part.
2016-17 (Fall 2016)	ECC: ACR 30	Electric Controls	SLO #3 Electrical Board Troubleshooting	After reading the textbook and participating in classroom discussions, students will apply their knowledge of a ladder diagram to diagnose and troubleshoot the wiring and operation of an electrical board.
2016-17 (Spring 2017)	ECC: ACR 32	Fundamentals of Pneumatic Controls	SLO #1 Calibrating Thermostats	After reading the textbook and participating in class discussions, students will apply their knowledge of appropriate lab practices, concepts and theories to a pneumatic thermostat. Student will calibrate the thermostat to the manufacturer's specification and check the proper operation of thermostat and the pneumatic actuator.
2016-17 (Spring 2017)	ECC: ACR 32	Fundamentals of Pneumatic Controls	SLO #2 Hot Water Heating System	After reading the textbook and participating in classroom discussions, students will apply their knowledge of pneumatics to gather data and analyze a pneumatic controlled hot water heating system and know the sequence of operations of the heating system.
2016-17 (Spring 2017)	ECC: ACR 32	Fundamentals of Pneumatic Controls	SLO #3 Electric-Pneumatic Systems	After reading the textbook and participating in classroom discussions, students will apply their knowledge of electric-pneumatic systems to collect data and analyze data from a schematic diagram and present the sequence of operations of the system.
2017-18 (Fall 2017)	ECC: ACR 34	HVAC Customer Service	SLO #1 Irrate Customer	After reading the textbook and participating in class discussions, students will apply their knowledge of appropriate communication skills to calm down an irate customer who is complaining that it took too long for the technician to arrive and it is very hot due to an air

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2017-18 (Fall 2017)	ECC: ACR 34	HVAC Customer Service	SLO #2 Air Conditioning Estimate	After participating in classroom discussions, students will apply their knowledge of appropriate communicating skills to estimate an air conditioning job with labor, parts, and taxes including an explanation of all costs to the customer.
2017-18 (Fall 2017)	ECC: ACR 34	HVAC Customer Service	SLO #3 Selling a PM Plan	After participating in classroom discussions, students will apply their knowledge of appropriate communicating to sell a PM plan to a customer with all the positives of a PM. Students must know the difference in plans for the different seasons.