Assessment: Course Four Column

Spring/Summer 2019

El Camino: Course SLOs (IND) - Air Conditioning and Refrigeration

ECC: ACR 21:Air Conditioning Fundamentals

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
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. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Fall 2014), 2018-19 (Spring 2019) **Input Date:** 11/12/2013	**Laboratory Project/Report -** Students will log system operating conditions and analyze system operation **Standard and Target for Success:** Students will safely align required data with manufactures specification using the appropriate tools and personal protective equipment. **Additional Information:** This assignment validates student safe working habits	**Semester and Year Assessment Conducted:** 2018-19 (Spring 2019) **Standard Met? :** Standard Met Students are assigned the task of completing a service log on a packaged and/or split AC unit. Each student must perform a refrigeration and electrical evaluation of the unit. Students are graded on there successfully on completing all of the test measurements. 50% of the students were successful on the first attempt while the remaining 50% required several attempts to complete the required tasks. In the end each student was successful in completing assigned tasks. (06/03/2019) **% of Success for this SLO:** 100 **Faculty Assessment Leader:** Steven Faris **Faculty Contributing to Assessment:** Steven Faris	**Action:** Received new safety equipment and videos. (06/03/2020) **Action Category:** Program/College Support
		Semester and Year Assessment Conducted: 2014-15 (Fall 2014) **Standard Met? :** Standard Met Students are assigned the task of completing a service log on a packaged AC unit. Each student must perform a refrigeration and electrical evaluation of the unit. Students are graded on there successfully on completing all of the test measurements. 5% of the students were successful on there first attempt while the remaining 95% required several attempts to complete the required tasks. In the end	**Action:** Continue to monitor test scores for student success and outcomes. (04/23/2016) **Action Category:** Teaching Strategies

Course SLOs	Assessment Method Description	Results	Actions
		each student was successful in completing assigned tasks. (02/19/2015) **Faculty Assessment Leader:** Timothy Muckey	

ECC: ACR 23:Commercial Refrigeration Applications

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
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. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Fall 2015), 2018-19 (Spring 2019) **Input Date:** 11/12/2013	**Laboratory Project/Report -** Students will log system operating conditions and analyze system performance. **Standard and Target for Success:** Students will plot system performance and validate or adjust system performance to meet system specification 75% of students will score 85% or higher on evaluation. **Additional Information:** This assignment helps students understand the data logging process.	**Semester and Year Assessment Conducted:** 2017-18 (Spring 2018) **Standard Met? :** Standard Met Students will plot system performance and validate or adjust system performance to meet system specification 80% of students will score 85% or higher on evaluation. (06/03/2019) **% of Success for this SLO:** 100 **Faculty Assessment Leader:** Steven Faris **Faculty Contributing to Assessment:** Steven Faris	
		Semester and Year Assessment Conducted: 2018-19 (Spring 2019) **Standard Met? :** Standard Met Students will be required to describe the proper operation of the refrigeration piece of equipment with 80% accuracy by the end of the course. Students will be required in this process to fully explain the operation of the system to the instructor to receive this grade. 90% of the students did this with 85% success rate. Students generally have difficulty with wiring diagrams. This assessment will include pre-evaluations and instructor-led practical assessment of the diagram reading. (06/03/2019) **% of Success for this SLO:** 100 **Faculty Assessment Leader:** Steven Faris **Faculty Contributing to Assessment:** Steven Faris	**Action:** Received new equipment and chillers in the shop that have cutaway and clear sections for better component identification. (06/03/2020) **Action Category:** Program/College Support
		Semester and Year Assessment Conducted: 2015-16 (Fall 2015) **Standard Met? :** Standard Met Students completing the performance testing: 79% of students received a grade of 80% or higher on their first analysis. The remaining remaining students received the same results by their third attempt. (02/05/2016) **Faculty Assessment Leader:** Tim Muckey	**Action:** Follow up on new assessment logs (03/15/2017) **Action Category:** Teaching Strategies **Follow-Up:** Adding new loges and resources to meet evolving standards (02/05/2016)
	Laboratory Project/Report - Students will successfully complete a lab report that documents there skill level.	**Semester and Year Assessment Conducted:** 2015-16 (Fall 2015) **Standard Met? :** Standard Met 95% of students completed project with a 89% or higher	**Action:** Update training logs (04/12/2017) **Action Category:** Teaching Strategies

Course SLOs	Assessment Method Description	Results	Actions
	Standard and Target for Success: Students will produce a commissioning log with 89% accuracy **Additional Information:** The lab report is linked to class room learning	grade by the end of the course. (02/05/2016) **Faculty Assessment Leader:** Tim Muckey	**Follow-Up:** Updating walkin cooler with data logging system (02/05/2016)

ECC: ACR 25:Energy Efficient Residential, Commercial and Industrial Air Conditioning

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
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. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Fall 2015), 2018-19 (Spring 2019) **Input Date:** 11/12/2013	**Laboratory Project/Report -** Students will log system performance and, based on acquired data, determine system efficiency. **Standard and Target for Success:** Accurately determining with 80% accuracy system performance based on manufacturers' data. **Additional Information:** This assessment helps students understand system performance variables.	**Semester and Year Assessment Conducted:** 2018-19 (Spring 2019) **Standard Met? :** Standard Met Students are required to data log system performance with 80% accuracy. Students will take all readings necessary to complete the data log. The instructor will evaluate student performance based on the accuracy of the assessment. 90% of the students completed with 85% accuracy on the first try. All students completed the tasks in the required timeframe. (06/03/2019) **% of Success for this SLO:** 100 **Faculty Assessment Leader:** Steven Faris **Faculty Contributing to Assessment:** Steven Faris	**Action:** Utilizing manufacturers data, accessible on the internet, students need to be allowed to use their electronic devices to complete the tasks. (06/03/2020) **Action Category:** Teaching Strategies
		Semester and Year Assessment Conducted: 2015-16 (Fall 2015) **Standard Met? :** Standard Met Students were required to test and report and adjust system operation to meet manufactures specifications. 95% of students received a grade of 70% or higher by the end of the course. Of these 80% exceeded a grade of 80% or higher by the end of the course. (02/05/2016) **Faculty Assessment Leader:** Tim Muckey	**Action:** Updating equipment to give provide students the opportunity to work on more complex equipment. (02/05/2017) **Action Category:** Program/College Support **Follow-Up:** Added Chillers and water source heatpumps and system controls to program. (02/05/2016)
	Laboratory Project/Report - Students will be required to apply classroom knowledge to the practical application of assessing a package or conditioning systems efficiency. Students will deal on equipment perform required calculations to assess system performance. **Standard and Target for Success:** Students are required to data log system performance with 80% accuracy. Students will take all	**Semester and Year Assessment Conducted:** 2015-16 (Fall 2015) **Standard Met? :** Standard Met 100% of students were able to complete this SLO with 75% or greater accuracy and 58% with 80% or greater accuracy. (02/05/2016) **Faculty Assessment Leader:** Tim Muckey	**Action:** Equipment updates have made this SLO more effective for students. Research and monitor to ensure equipment used is current and up-to-date. (02/05/2017) **Action Category:** Program/College Support **Follow-Up:** Updated equipment and system controls helps improve this SLO results (02/05/2016)

Course SLOs	Assessment Method Description	Results	Actions
	readings necessary to complete the data log. The instructor will evaluate student performance based on accuracy of assessment. **Additional Information:** Energy efficiency is a primary goal of this course. This exercise provides students an in-depth understanding of system performance.		

ECC: ACR 30:Electric Controls

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
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. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Summer 2016), 2018-19 (Summer 2019) **Input Date:** 11/12/2013	**Performance -** Students will select an HVAC or R unit from the Lab. inventory. Assignment will consist of; listing all related electrical, safety and control components. Create a "Ladder" diagram of units existing wiring. **Standard and Target for Success:** Students will accurately document; explain the operation of all components, describe the sequence of operation, electrical, safety and control components, create a Ladder Diagram based on the units sequence of operation with 85% accuracy in a written document **Additional Information:** This assessment establishes student skill level, **Laboratory Project/Report -** Students will utilize their previously created "Ladder" diagrams and create exact or simulated working example with the lab. electrical trainers. Students learning is based up on the level of execution in converting the documentation into working models. **Standard and Target for Success:** Grading: A=100-90 B=89-80 C=79-69 D= 68- 59 F= Below 59 78% of students are expected to achieve a grade 80% or better on this evaluation.	**Semester and Year Assessment Conducted:** 2015-16 (Summer 2016) **Standard Met? :** Standard Met 85% of students received an 89% or better grade without assistance from the instructor while the remainder had minor problems require some instructor assistance passing with an 80% or better. (06/24/2016) **Faculty Assessment Leader:** Timothy Muckey	**Action:** Research and monitor to ensure equipment used is current and up-to-date, and evaluate student understanding. (08/24/2017) **Action Category:** Teaching Strategies

ECC: ACR 31:HVAC Electronics

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Electronic Board on a High Efficiency System - After reading the textbook and participating in class discussions, students will apply their knowledge of appropriate lab practices, concepts and theories to an electronic board on a High Efficiency system. Students will check for the proper function of the electronic board and study the LED indicator lights for an improper function of the operating system. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Summer 2016), 2018-19 (Summer 2019) **Input Date:** 05/19/2015	**Exam/Test/Quiz -** After participating in classroom lectures, subject matter discussions and the viewing of industry related media content students will apply their gained knowledge to the successful completion of exams. **Standard and Target for Success:** Based up on percentage, it is expected that a success rate equal to or greater than 85% will be achieved.	**Semester and Year Assessment Conducted:** 2018-19 (Summer 2019) **Standard Met? :** Standard Met Success rate was equal to or greater than 85%. Of the 33 students completing, 1 failed. Actual success rate is greater than 99%. (09/14/2019) **% of Success for this SLO:** 85 **Faculty Assessment Leader:** Phil Jeffrey	**Action:** Align SLO's with actual program execution, i.e. currently scheduled as lecture only. (09/14/2020) **Action Category:** Curriculum Changes

ECC: ACR 62:Energy Control and Optimization Systems

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #3 DDC Controllers - Students completing course requirements will demonstrate the ability to setup and configure a programmable and configurable controller inputs, outputs, virtual points, and perform simple logic programming on DDC controllers. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2018-19 (Spring 2019) **Input Date:** 08/24/2015	**Project -** Setup and configure a "DDC" Universal Controller. **Standard and Target for Success:** Demonstrate the ability to setup and configure a "DDC" Universal Controller. **Additional Information:** This is a vital assignment in relation to current and developing technologies as applied to the HVACR industry.	**Semester and Year Assessment Conducted:** 2018-19 (Spring 2019) **Standard Met? :** Standard Met Demonstrate the ability to set up and configure a "DDC" Universal Controller. 90% of the students completed over 85% of the assignments in the allotted timeframe. (06/03/2019) **% of Success for this SLO:** 100 **Faculty Assessment Leader:** Steven Faris **Faculty Contributing to Assessment:** Steven Faris	**Action:** To set up the DDC controller, this required the use of the TRANE licensed software. Need to purchase DDC controller software that doesn't require a license. (06/03/2020) **Action Category:** Program/College Support