



Cycle: 2018-2021

ASSOCIATE IN APPLIED SCIENCE WITH A MAJOR IN HEATING, VENTILATION, AND AIR CONDITIONING TECHNOLOGY

Program Mission Statement:

The Heating, Ventilation, and Air Conditioning (HVAC) degree is a 2-year program that will provide students with the necessary knowledge of installing, maintaining, and repairing heating, air conditioning, and refrigeration equipment.

Division: Technical and General Education

AVP: Dan Averette

Department Chair: Keith McKenzie

Director: Matthew Lewis

SACSCOC Standard: 8.2A

Accrediting Agency: Yes No

Name:

Certification Exam(s): Yes No

Agency Name:

Credential:

Program Student Learning Outcome	Monitoring Year
Apply knowledge of installing air conditioning system	2018-2019
Demonstrate how to read electrical diagrams and diagnose electrical circuits	2019-2020
Demonstrate how to read temperature/pressure charts and diagnose problems within the system	2019-2020
Demonstrate a proper Load Calculation of a structure	2019-2020
Apply knowledge of the air conditioning system to repair problems	2020-2021
Fabricate, assemble, and install duct work using various sheet metal tools	2020-2021
Demonstrate a proper Load Calculation of a structure	2020-2021

STUDENT LEARNING OUTCOMES FOR AAS.ACR -- 2018-2019

A. Program Student Learning Outcomes	B. What courses are PSLOs Assessed	C. Methods for Outcomes Assessment	D. Expected Level of Program Performance	E. Data Collection	F. Results	G. Plan For Improvement
What should the graduates of your program be able to do?	Where do you see evidence that the student can do these things?	How does your program evaluate student/graduate skills/abilities?	What is the expected level of student performance <u>for the program</u> ?	When will you collect the data needed to evaluate the performance of the program?	What are the results of the evaluation? NOTE: include student ratio with all results.	How will you use this information to improve the program
Apply knowledge of installing air conditioning system.	ACR 120 Basic Air Conditioning	Students will have to design and draw a basic air conditioning circuit and label the components.	70% of students will pass the Final Exam with a score of 70% or better.	Fall 2019	14 out of 20 students (70%) received a 70% or higher on the Final Exam for this assessment. The lowest score was a 47% and the highest score was 94%. The cohort average was 75.65%.	The expected learning outcome was met and extra time will be devoted to ensuring students can master the installation of an air conditioning system.

STUDENT LEARNING OUTCOMES FOR AAS.ACR -- 2019-2020

A. Program Student Learning Outcomes	B. What courses are PSLOs Assessed	C. Methods for Outcomes Assessment	D. Expected Level of Program Performance	E. Data Collection	F. Results	G. Plan For Improvement
What should the graduates of your program be able to do?	Where do you see evidence that the student can do these things?	How does your program evaluate student/graduate skills/abilities?	What is the expected level of student performance <u>for the program</u> ?	When will you collect the data needed to evaluate the performance of the program?	What are the results of the evaluation? NOTE: include student ratio with all results.	How will you use this information to improve the program
Demonstrate how to read electrical diagrams and diagnose electrical circuits.	ACR 206 Advanced Electricity for HVAC/R	Students will demonstrate how build a control board using electrical relays and switches.	70% of students will pass the with a 70% or better.	Spring 2019	8 out of the 9 students (89%) received a 70% or better on Hands-On Assessment on Exam 3. The cohort average was 92%.	The expected level of learning was met, and students will continue to build different circuits to enhance their skills.

STUDENT LEARNING OUTCOMES FOR AAS.ACR -- 2019-2020

A. Program Student Learning Outcomes	B. What courses are PSLOs Assessed	C. Methods for Outcomes Assessment	D. Expected Level of Program Performance	E. Data Collection	F. Results	G. Plan For Improvement
What should the graduates of your program be able to do?	Where do you see evidence that the student can do these things?	How does your program evaluate student/graduate skills/abilities?	What is the expected level of student performance <u>for the program</u> ?	When will you collect the data needed to evaluate the performance of the program?	What are the results of the evaluation? NOTE: include student ratio with all results.	How will you use this information to improve the program
Demonstrate how to read temperature/pressure charts and diagnose problems within the system.	ACR 101 Fundamentals of Refrigeration	Students will demonstrate how to convert temperature to pressure on pressure temperature charts.	70% of students will pass with a score of a 70% or greater.	Fall 2020	18 of 19 students (94%) passed Exam 2 with a score of 70% and greater. The cohort average was 88.84%.	The expected level of learning was met and students will continue to be given different temperature/pressure scenarios to develop their skills.

STUDENT LEARNING OUTCOMES FOR AAS.ACR – 2019-2020

A. Program Student Learning Outcomes	B. What courses are PSLOs Assessed	C. Methods for Outcomes Assessment	D. Expected Level of Program Performance	E. Data Collection	F. Results	G. Plan For Improvement
What should the graduates of your program be able to do?	Where do you see evidence that the student can do these things?	How does your program evaluate student/graduate skills/abilities?	What is the expected level of student performance <u>for the program</u> ?	When will you collect the data needed to evaluate the performance of the program?	What are the results of the evaluation? NOTE: include student ratio with all results.	How will you use this information to improve the program
Demonstrate a proper Load Calculation of a structure.	ACR 221 Residential Load Calculations	Students are given a floor plan and construction numbers of a structure and must enter the correct values into an ACCA Manual J excel work sheet to determine the necessary heating and cooling requirements.	70% of students will pass the Load Calculation Final with a score of 70% or greater.	Summer 2019	8 out of 13 students (62%) passed the final exam with a score of 70% or greater. The lowest score was a 0 and the highest score was a 90%. The cohort average was a 69%.	The expected level of learning was not met. Students struggle to understand the many of the different construction materials used in the field. This is part of the key component in setting up the excel spreadsheet. Students also had trouble understanding the new ACCA Manual J Excel work sheet. The faculty will continue to come up with different ways to help students understand these construction components when developing a load calculation. Faculty will also help students become familiar with the new excel sheet.

STUDENT LEARNING OUTCOMES FOR AAS.ACR -- 2020-2021

A. Program Student Learning Outcomes	B. What courses are PSLOs Assessed	C. Methods for Outcomes Assessment	D. Expected Level of Program Performance	E. Data Collection	F. Results	G. Plan For Improvement
What should the graduates of your program be able to do?	Where do you see evidence that the student can do these things?	How does your program evaluate student/graduate skills/abilities?	What is the expected level of student performance <u>for the program</u> ?	When will you collect the data needed to evaluate the performance of the program?	What are the results of the evaluation? NOTE: include student ratio with all results.	How will you use this information to improve the program
Apply knowledge of the air conditioning system to repair problems.	ACR 110 Heating Fundamentals	Students will Identify components and discuss the operation of a gas heating system.	70% of students will pass Ch. 31 Exam with a score of 70% or greater.	Spring 2020	All students (100%) passed Ch. 31 exam with a score of 70% or greater. The cohort average was 87.8%.	The expected level of learning was met and students will continue to review the basic necessary steps on gas heat operation. It is expected that the student must master the sequence of operations of a gas heating unit as they move through this chapter. This involves giving the students periodic quizzes to show that they have memorized this sequence of operation.

STUDENT LEARNING OUTCOMES FOR AAS.ACR– 2020-2021

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What should the graduates of your program be able to do?	Where do you see evidence that the student can do these things?	How does your program evaluate student/graduate skills/abilities?	What is the expected level of student performance <u>for the program</u> ?	When will you collect the data needed to evaluate the performance of the program?	What are the results of the evaluation? NOTE: include student ratio with all results.	How will you use this information to improve the program
Fabricate, assemble, and install duct work using various sheet metal tools.	ACR 250 Duct Fabrication	Students should be able to demonstrate how to assemble sheet metal fittings using various fasteners.	70% of the students will pass the Final Assembly Exam with a score of 80% or better.	Summer 2020	85% of students passed the Final Assembly exam with a score of 80% or greater. The cohort average was 91%.	The expected level of learning was met and students will continue to understand the importance or how each duct fitting is measured and assembled. This assignment if done correctly from the start of the semester will most likely result in a good grade at the end due to all of the fittings having to fit together as the student continues through the semester.

STUDENT LEARNING OUTCOMES FOR AAS.ACR – 2019-2020

A. Program Student Learning Outcomes	B. What courses are PSLOs Assessed	C. Methods for Outcomes Assessment	D. Expected Level of Program Performance	E. Data Collection	F. Results	G. Plan For Improvement
What should the graduates of your program be able to do?	Where do you see evidence that the student can do these things?	How does your program evaluate student/graduate skills/abilities?	What is the expected level of student performance <u>for the program</u> ?	When will you collect the data needed to evaluate the performance of the program?	What are the results of the evaluation? NOTE: include student ratio with all results.	How will you use this information to improve the program
Demonstrate a proper Load Calculation of a structure.	ACR 221 Residential Load Calculations	Students are given a floor plan and construction numbers of a structure and must enter the correct values into an ACCA Manual J excel work sheet to determine the necessary heating and cooling requirements.	70% of students will pass the Load Calculation Final with a score of 70% or greater.	Summer 2020	10 out of 13 students (77%) passed the final exam with a score of 70% or greater. The lowest score was a 0 and the highest score was a 100%. The cohort average was a 69%.	This time around, the expected level of learning was met. This value rose by 15% and the class average increased by 3%. This was achieved by applying more time to helping students understand the Excel document as reflecting by the plan previously described.

CONTINUOUS STUDENT IMPROVEMENT

This Cycle's Results and Comparison to Last Cycle's and Recommended Actions:

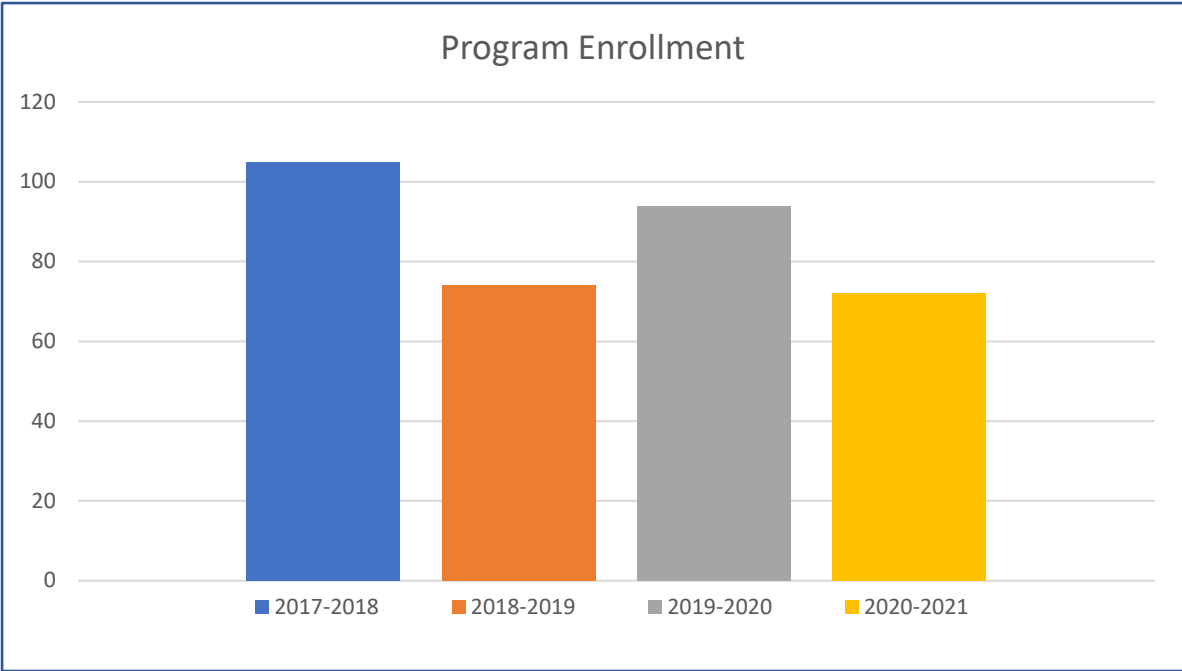
When evaluating this cycle's performance with data from the previous cycle, we can see that student performance was down in some areas and improved in others. We did have one class which did not have any data to compare with the last cycle. Part of this can be attributed to the fact that one of the full-time instructors had retired, and the department hired a new full-time instructor.

An adjunct instructor was hired because of the addition of new dual enrollment HVAC classes for both the main campus and the new Continuum. The new full-time instructor is no longer with the college and the adjunct replaced his position. All of this created some challenges for the students in adjusting to the new teaching styles and scenarios.

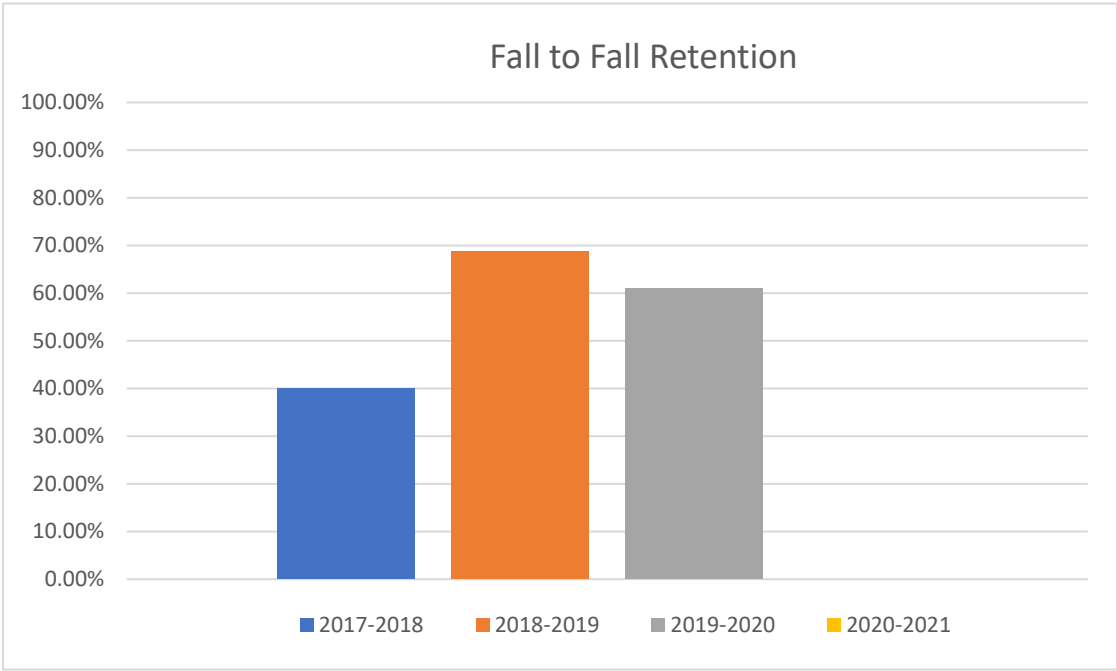
When looking at the first PSLO from ACR 120 we can see performance was slightly down from the last cycle. The results were not down drastically and may be as a result of the new instructor's style of teaching and helping students understand the material. The performance of the PSLO's for ACR 101 and 110 remained relatively the same. We do not feel that anything should be changed in these two areas. We will continue to monitor these two PSLO's to make sure student performance is maintained.

There was no data to compare ACR 206 with the last cycle. The instructor who taught this class has retired and no information is given on the results of the last cycle. The PSLO for ACR 250 showed an improvement compared to the last cycle. More time was devoted to the students to stress the importance measuring duct fittings to ensure proper fitting in the end. The PSLO performance for ACR 221 was down. This had to do with the going away of manually inputting data on paper to entering the data into an excel work sheet. As students get familiar with understanding the construction materials needed, they also must become familiar with entering an enormous amount of data into an excel worksheet. If data is not entered properly, it can throw the whole layout off. More time will be devoted to dissecting different sections out of the sheet and work on these individually, so students do not get overwhelmed. The next time the class was offered, student performance had improved. Overall, the HVAC faculty feels that performance will continue to improve. All the HVAC students from these different cohorts have graduated and most of all of them are working in the field. Many have gone on to pass the SC Mechanical Contractors exam and EPA exam.

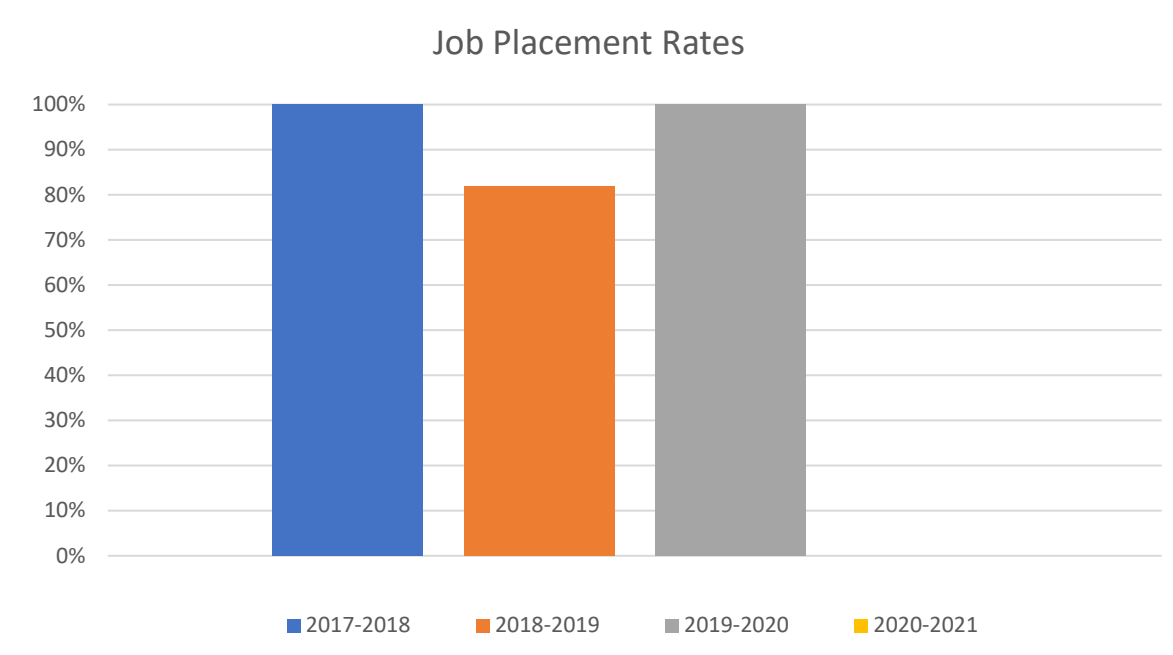
PROGRAM VITAL STATISTICS

Indicator	Trend Analysis	Action Plans										
<p style="text-align: center;">Program Enrollment</p>  <table border="1" data-bbox="109 191 1283 857"> <caption>Program Enrollment Data</caption> <thead> <tr> <th>Year</th> <th>Enrollment</th> </tr> </thead> <tbody> <tr> <td>2017-2018</td> <td>105</td> </tr> <tr> <td>2018-2019</td> <td>75</td> </tr> <tr> <td>2019-2020</td> <td>95</td> </tr> <tr> <td>2020-2021</td> <td>72</td> </tr> </tbody> </table>	Year	Enrollment	2017-2018	105	2018-2019	75	2019-2020	95	2020-2021	72	<p>Enrollment has been steady. The reason for the fluctuation is due to the new class of dual enrollment students every other fall. Overall, HVAC has always maintained full classes.</p>	<p>HVAC does not see any reason to change anything as enrollment has continued to stay steady. The HVAC classes continue to be full year after year.</p>
Year	Enrollment											
2017-2018	105											
2018-2019	75											
2019-2020	95											
2020-2021	72											

Indicator	Trend Analysis	Action Plans										
<p style="text-align: center;">Fall to Spring Persistence</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Fall to Spring Persistence Data</caption> <thead> <tr> <th>Year</th> <th>Persistence (%)</th> </tr> </thead> <tbody> <tr> <td>2017-2018</td> <td>58%</td> </tr> <tr> <td>2018-2019</td> <td>72%</td> </tr> <tr> <td>2019-2020</td> <td>32%</td> </tr> <tr> <td>2020-2021</td> <td>68%</td> </tr> </tbody> </table>	Year	Persistence (%)	2017-2018	58%	2018-2019	72%	2019-2020	32%	2020-2021	68%	<p>Part of the dip in the 2019-2020 year was because more students were enrolled in the certificate program than the degree program. Another factor for the increase every other year is for the new cohort of students that have come from the dual enrollment program.</p>	<p>HVAC will encourage more students to apply for the degree program.</p>
Year	Persistence (%)											
2017-2018	58%											
2018-2019	72%											
2019-2020	32%											
2020-2021	68%											

Indicator	Trend Analysis	Action Plans										
<p style="text-align: center;">Fall to Fall Retention</p>  <table border="1" data-bbox="142 183 1251 849"> <caption>Fall to Fall Retention Data</caption> <thead> <tr> <th>Academic Year</th> <th>Retention Percentage</th> </tr> </thead> <tbody> <tr> <td>2017-2018</td> <td>40.00%</td> </tr> <tr> <td>2018-2019</td> <td>68.00%</td> </tr> <tr> <td>2019-2020</td> <td>60.00%</td> </tr> <tr> <td>2020-2021</td> <td>0.00%</td> </tr> </tbody> </table>	Academic Year	Retention Percentage	2017-2018	40.00%	2018-2019	68.00%	2019-2020	60.00%	2020-2021	0.00%	<p>Most of all degree students continue to complete the degree program.</p>	<p>HVAC will continue to monitor student progress and help students finish the program.</p>
Academic Year	Retention Percentage											
2017-2018	40.00%											
2018-2019	68.00%											
2019-2020	60.00%											
2020-2021	0.00%											

Indicator	Trend Analysis	Action Plans										
<p style="text-align: center;">Graduation Rates</p> <table border="1"> <caption>Graduation Rates Data</caption> <thead> <tr> <th>Year</th> <th>Graduation Rate (%)</th> </tr> </thead> <tbody> <tr> <td>2017-2018</td> <td>100%</td> </tr> <tr> <td>2018-2019</td> <td>~72%</td> </tr> <tr> <td>2019-2020</td> <td>~95%</td> </tr> <tr> <td>2020-2021</td> <td>~35%</td> </tr> </tbody> </table>	Year	Graduation Rate (%)	2017-2018	100%	2018-2019	~72%	2019-2020	~95%	2020-2021	~35%	<p>The reason for the dip in the 2020-2021 year is due to the fact that most of the degree students graduated out of the program in the summer instead of the spring. This report is not up to date. If the data were entered to show the students who graduated in the summer the statistics would be on par with the previous years. The delay can also be attributed to Covid-19. The 2017-2018 graduation rates show over 100% due to the fact that the school found a large percentage of students who were eligible to graduate for the certificate. These students continued on and completed the degree.</p>	<p>Although there was dip in the 2021 year due to students graduating later, HVAC faculty feels as if no action needed at this time. HVAC will continue to monitor student success and continue to help students stay on path for graduation.</p>
Year	Graduation Rate (%)											
2017-2018	100%											
2018-2019	~72%											
2019-2020	~95%											
2020-2021	~35%											

Indicator	Trend Analysis	Action Plans										
<p style="text-align: center;">Job Placement Rates</p>  <p>The bar chart displays job placement rates for three consecutive periods. The y-axis represents the percentage of job placement, ranging from 0% to 100% in 10% increments. The x-axis lists the periods: 2017-2018, 2018-2019, 2019-2020, and 2020-2021. The 2017-2018 period shows a 100% placement rate (blue bar). The 2018-2019 period shows an 82% placement rate (orange bar). The 2019-2020 period shows a 100% placement rate (grey bar). The 2020-2021 period has no bar, indicating a 0% placement rate.</p> <table border="1" data-bbox="113 162 1278 812"> <thead> <tr> <th>Year</th> <th>Job Placement Rate</th> </tr> </thead> <tbody> <tr> <td>2017-2018</td> <td>100%</td> </tr> <tr> <td>2018-2019</td> <td>82%</td> </tr> <tr> <td>2019-2020</td> <td>100%</td> </tr> <tr> <td>2020-2021</td> <td>0%</td> </tr> </tbody> </table>	Year	Job Placement Rate	2017-2018	100%	2018-2019	82%	2019-2020	100%	2020-2021	0%	<p>The HVAC industry is growing year after year. HVAC contractors are always looking for new students and employees to fill positions. HVAC is an industry that will continue to grow on into the future.</p>	<p>The HVAC department will continue to hold advisory meetings and will continue to reach out to employers and help place students into the work force.</p>
Year	Job Placement Rate											
2017-2018	100%											
2018-2019	82%											
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