Cycle: 2018-2021

Associate's Degree IN APPLIED SCIENCE WITH A MAJOR IN Mechanical Engineering Technology

Program Mission Statement:
The Mechanical Engineering Technology program (MET) uses classroom and laboratory experiences to prepare graduates to work as engineering technicians and related engineering technology positions in various industries and production facilities. The intent is broad-based education that gives the student a number of career choices.

Division: Technical & General Education

AVP: Dan Averette
Department Chair: Shawn Reed
Director: David C. Edwards
SACSCOC Standard: 8.2A

Accrediting Agency: ☐ Yes ☒ No
Name: N/A
Certification Exam(s): ☐Yes ☒ No
Agency Name:
Credential:

Program Student Learning Outcome	Monitoring Year
Students will employ 3D CAD software tools to create both part and assembly models and employ simulation software to characterize mechanical systems and to convey both design concepts and detail to both technical and non-technical personnel.	2018-2019
Students will build, test, and characterize fundamental electrical circuits. Students will apply learned PLC programming concepts and practical circuit knowledge and integrate into electromechanical systems to meet production specifications.	2019-2020
Students will interface with basic automation and robotic systems. Students will create specific task programs to accomplish tiered pick and place operations; they will troubleshoot operational errors to ensure proper program operation.	2019-2020
Students will build, test, and troubleshoot fundamental hydraulic and pneumatic systems. Students will characterize pertinent system parameters to include pressure, force, area(s), displacement, and flow. Students will integrate pressure control, flow control, and directional control according to specifications. Students will design PLC programs to automate pneumatics system operation as required.	2020-2021
Model a basic machine system and characterize pertinent mechanical parameters to include mechanical advantage and work done. Students will investigate mechanical efficiencies and optimize processes to meet specifications.	2020-2021

STUDENT LEARNING OUTCOMES FOR AAS.MET – 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 for the program?	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
Applied Technologies: Students will employ 3D CAD software tools to create both part and assembly models and employ simulation software to characterize mechanical systems and to convey both design concepts and detail to both technical and non-technical personnel.	EGT 281	Students will complete a comprehensive additive manufacturing term project. The project will involve use of applicable software to modify, process, and submit parts to process equipment to produce final parts within applicable tolerances.	70% of students will achieve a 70% or better grade in the project.	Spring 2019	**15/15** students [100%] met the objective. The lowest assessment score was 80%; the highest score was 100%; the average for this cohort was 97%	The expected level of performance was met.

STUDENT LEARNING OUTCOMES FOR AAS.MET -- 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 for the program?	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
Applied Technologies: Students will build, test, and characterize fundamental electrical circuits. Students will apply learned PLC programming concepts and practical circuit knowledge and integrate into electromechanical systems to meet production specifications.	EEM 251	Students will employ applicable programmable logic controller (PLC) software to interface with electro-mechanical components and automate processes to achieve specified project outcomes. Specifically, students will create a PLC program to achieve a targeted result given pertinent process parameters. Students will be given a Programmable Logic Controller (PLC) project latching circuit scenario.	70% of students will achieve a 70% or better grade for the comprehensive project.	Spring 2020	4/5 [80%] students met the objective. The lowest assessment score was 60%; the highest score was 100%; the average for this cohort was 88%	The expected level of performance was met. Students will be given a process project PLC application during the next assessment cycle.

STUDENT LEARNING OUTCOMES FOR AAS.MET–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 for the program?	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
Applied Technologies: Students will interface with basic automation and robotic systems. Students will create specific task programs to accomplish tiered pick and place operations; they will troubleshoot operational errors to ensure proper program operation.	MET 213	Students will complete a robotics term project. The project will involve use of applicable software and equipment to investigate process mechanical parameters and to simulate a manufacturing process. Students will create specific task programs to accomplish tiered pick and place operations; they will troubleshoot operational errors to ensure proper program operation.	70% of students will achieve a 70% or better grade in the project.	Fall 2019	**7/8** [88%] students met the objective. The lowest assessment score was 0%; the highest score was 100%; the average for this cohort was 87.5%.	The expected level of performance was met. Faculty will develop fundamental assessments to improve student spatial awareness with respect to robot movement. Faculty will utilize simulations to complement awareness of robot capabilities and employ targeted practice sessions to supplement learning.

STUDENT LEARNING OUTCOMES FOR AAS.MET -- 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 for the program?	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
Applied Technologies: Students will build, test, and troubleshoot fundamental hydraulic and pneumatic systems. Students will characterize pertinent system parameters to include pressure, force, area(s), displacement, and flow. Students will integrate pressure control, flow control, and directional control according to specifications. Students will design PLC programs to automate pneumatics system operation as required.	MET 224	As part of comprehensive project assessment, students will develop relay logic to control a fundamental sequencing circuit operation to achieve a desired operational outcome.	70% of students will achieve a 70% or better grade in the project.	Spring 2021	**7/9** [78%] students met the objective. The lowest assessment score was 0%; the highest score was 97.33%; the average for this cohort was 79.85%.	The expected level of performance was met. Faculty will develop multiple targeted assessments to develop fundamental relay logic prowess amongst students. Assessments will involve team review and troubleshooting techniques; students will document errors for future reference.

STUDENT LEARNING OUTCOMES FOR AAS.MET -- 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 for the program?	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
Applied Technologies: Model a basic machine system and characterize pertinent mechanical parameters to include mechanical advantage and work done. Students will investigate mechanical efficiencies and optimize processes to meet specifications.	MET 231	Students will utilize 3D modeling software to construct a detailed mechanical system which completes specified tasks. Students will characterize the system performance according to specified parameters.	70% of students will achieve a 70% or better grade in the project.	Spring 2021	**7/8** [88%] students met the objective. The lowest assessment score was 0%; the highest score was 100%; the average for this cohort was 75.38%.	The expected level of performance was met. Faculty will schedule active 3D lab learning sessions oriented to simple machines outside of class to afford students additional practice to supplement the laboratory in order to further boost student performance in future comprehensive project assessments.

CONTINUOUS STUDENT IMPROVEMENT

Overall student performance met goals for this round of assessments. In the current evaluation cycle student performance was consistent across a broad range of assessments & learning objectives. The difficulty and scope of future cycle assessments will be increased; we will document student performance.

Faculty will enhance student robotic skills by expanding experiential labs utilizing purchased equipment. Faculty will also integrate robotic simulations into laboratory as applicable to inform students as to programming structure, execution, and troubleshooting. This will further enhance performance in the next assessment cycle. Robotic simulation software packages will be used to further develop student spatial awareness with respect to robot movement and programming limitations and to complement active laboratory exercises.

To increase student comprehension of the automation process, purchased PLC trainers will be integrated into machine design and systems operation coursework. Faculty members will develop multiple targeted assessments to boost relay logic prowess.

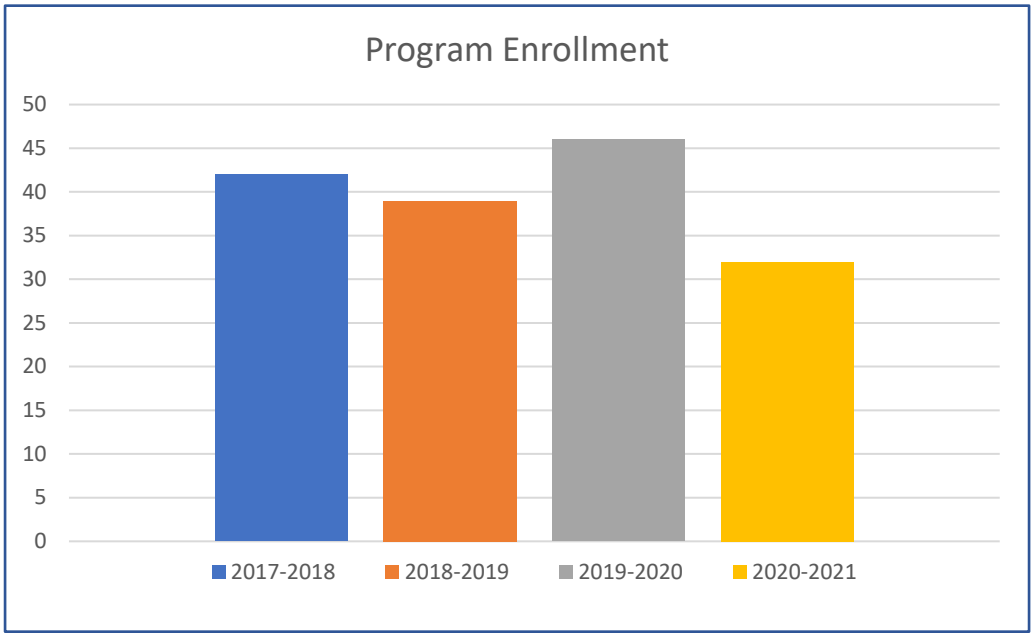
We have added a quantitative analysis component/computer technology component to all Engineering Technology Curricula to boost critical thinking/reasoning skills. We will be monitoring student performance moving forward into the next cycle.

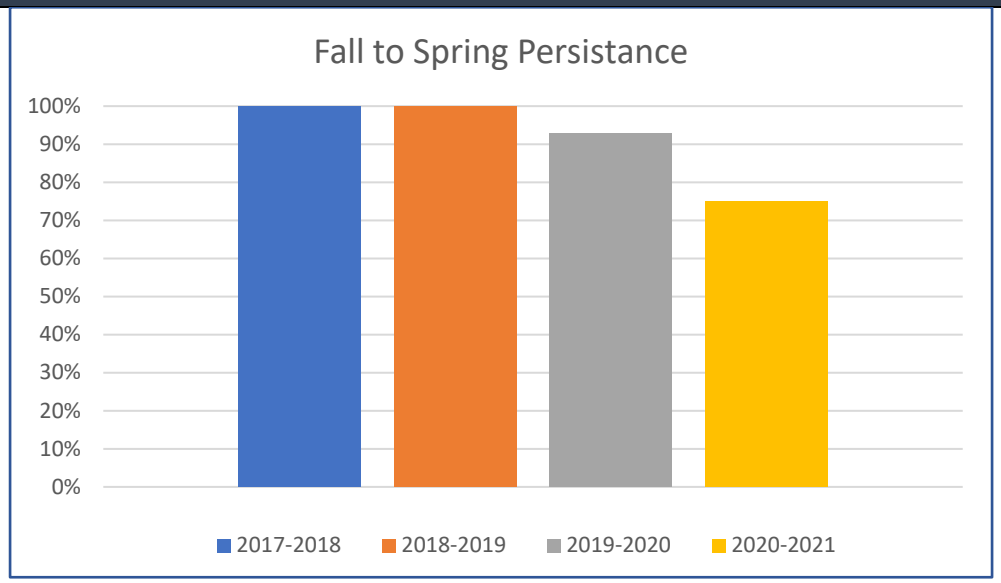
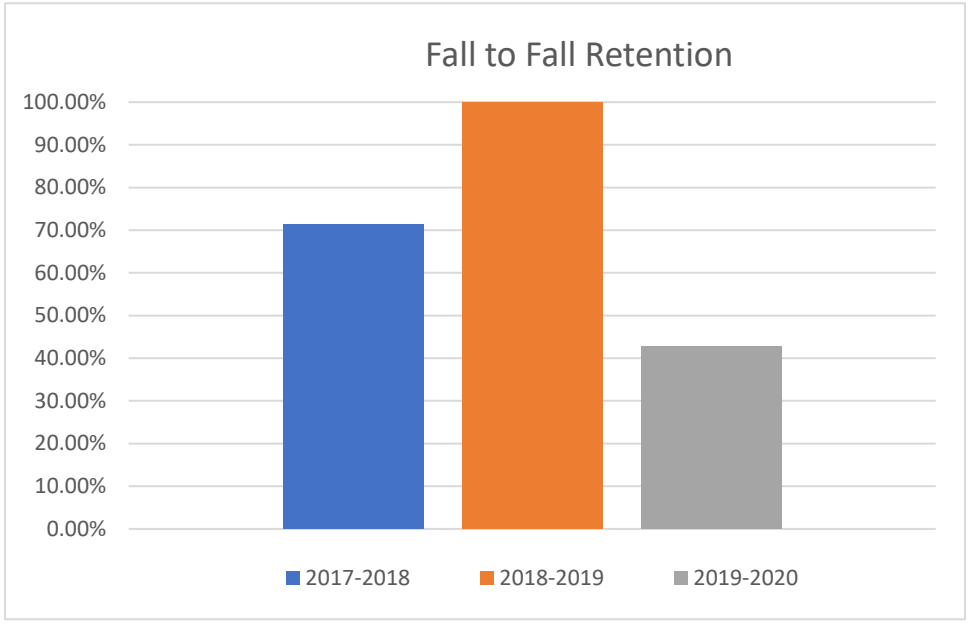
Active 3D lab learning sessions oriented to simple machines are being developed for extra-curricular student laboratory practice. This will be used to develop modelling prowess and to boost performance in student additive manufacturing coursework.

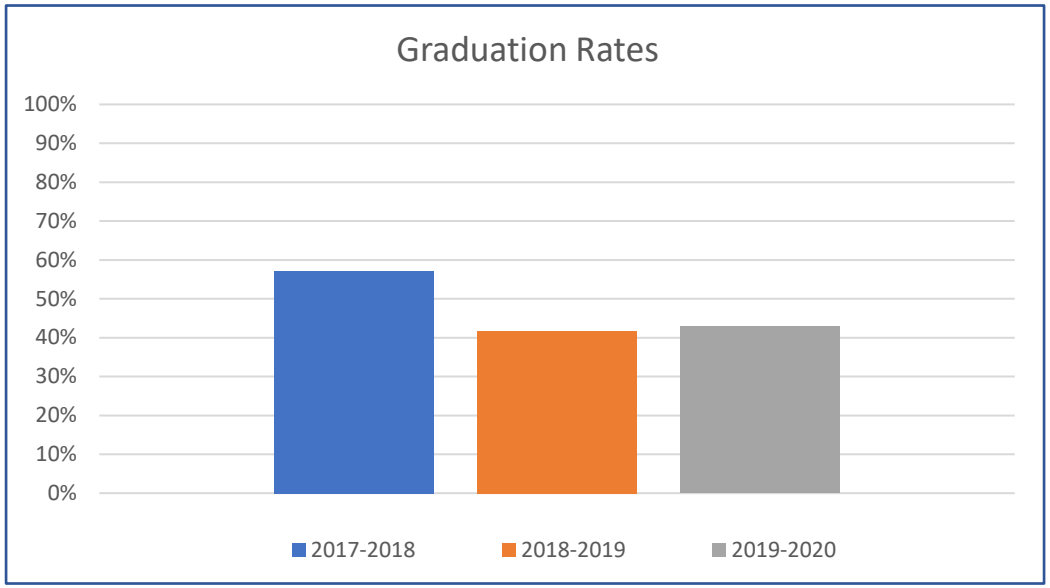
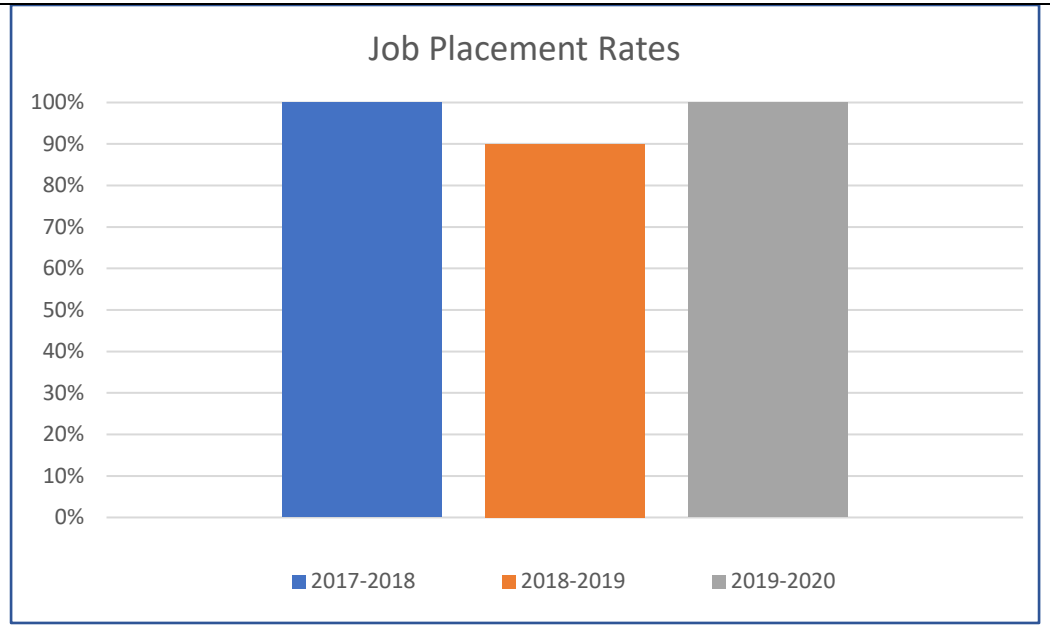
Enrollment has remained fairly consistent in recent terms. Logistics drive fall-to-spring persistence. Our largest challenge is fall-to-fall persistence. We will explore and identify initiatives to connect with and mentor students during the fall term.

Graduation rates and placement rates are consistently good – we must invest in methodology to increase retention rates.

PROGRAM VITAL STATISTICS

Indicator	Trend Analysis	Action Plans
	Enrollment is fairly consistent. Some disruption was noted due to pandemic repercussions.	Utilize service area provider networks to create a dynamic recruitment atmosphere. We will need to utilize media in non-traditional environs to continue to reach new students and maintain enrollment. The technical opportunities are there – we need to connect the students to them.

Indicator	Trend Analysis	Action Plans
	First semester to second semester persistence has been generally good.	We need to acquire focused data on student enrollment to identify STEM challenges and take initiative to bolster student achievement. We will also seek to connect students with student mentors within the first two terms of their enrollment.
	Fall to Fall persistence has been generally fair, save an anomaly due to pandemic repercussions.	We will strive to engage students in majors' courses sooner in their academic careers. Developing rapport with new students is increasingly important. We will also focus on connecting students with student mentors within the first three terms of their enrollment.

Indicator	Trend Analysis	Action Plans
	Graduation rates within the five-term window have diminished. The pandemic did have some impact. Other factors do exist.	We will identify challenges for new students and identify initiatives to address STEM difficulties and postsecondary preparation barriers.
	Placement rates remain consistently high.	Continue to work with industry liaison to identify placement opportunities for both internships and full-time positions.