

II. Program Learning Outcomes: A description of what you intend for students to know (cognitive), think/feel (affective), or do (psychomotor), when they have completed your degree program. A suggested manageable number of outcomes should be in the range of five to ten. Describe Program Learning Outcomes review activities.*

No changes have been made to the program outcomes since the last assessment interview because they are still in line with industry needs.

An entry-level graduate with an Associate of Applied Science Degree in Electromechanical Engineering Technology with Robotics from Sinclair Community College will be able to:

Learning Outcomes	Related Courses
1. Conduct simple mechanical repairs on typical electromechanical systems, from replacing, wiring, fluid power valving, piping, electromechanical devices, and other items that were original to the equipment, to installing new system modifications, then returning the system to operational specifications.	EGR 100, 217, 250
2. Diagnose electronic system problems using appropriate test instrumentation, schematics, technical reference manuals and determine if fault is electrical, electronic, software, or mechanical in nature. Recommend appropriate repair process and initiate repair.	EER 126, 128, 136, 139, 166
3. Utilize various computer software packages found in industry: CAD, robot programming languages, C programming, computer operating systems, word processing as necessary to perform repair/ modification/design tasks and document repair action.	EGR 128, 248, 252, 261; IET 198
4. Repair electrical and electronic systems, from devices, subsystems, wiring/cabling to circuit board level, and return to correct operation after testing.	EGR 251, 254, 278

Learning Outcomes	Related Courses
5. Integrate electronic control equipment into typical small CIM environment so that overall system performs to specification. Equipment includes: discrete devices, PLC's, sensors, robot application programming, communication hardware/software, computer related hardware.	EET 281; EGR 215, 252, 254, 255, 261, 278; EGR Elective
6. Integrate into work cell the appropriate Fanuc robot for the application. Select necessary end-of-arm tooling, and develop/edit motion control program for the application, using available software features and/or options.	EGR 128, 248, 252 254, 256; EGR Electives

III. **Assessment Method(s):** A measurable indicator of success in attaining the stated learning outcome(s). The methodology should be both reliable and valid. Please describe in detail.

- a. **Formative Assessment Methods(s) and Description:** a measurable indicator of student in-progress success in attaining the stated learning outcome(s).

The department is doing more hands-on assessment. There is more involvement in lab work and practice applications. EGR 128, Robotics in CIM Systems, is the most popular course in the curriculum. It has been developed into a general introduction to robotics. This course is a pre-requisite for all other courses. Students are exposed to different robot operation systems, software, and other basic information. Students don't progress in the degree if they don't do well in this course.

The department is moving towards use of more course projects. As students progress to the 200-level courses, the projects become more involved. A robotics work cell is used in the students' capstone project to showcase a variety of skills learned in the curriculum. Students are being challenged by use of more open-ended problems. Additional emphasis is being placed on problem-solving skills leading the department to look at a systems approach to problem solving.

- b. **Summative Assessment Method(s) and Description:** a measurable indicator of end-of-program success in attaining the stated program learning outcome(s).

EGR 278 is the capstone course for this program. It is a project-based course that permits faculty an opportunity to diagnose areas of weakness in students and provide the learning necessary proficiency in those areas.

IV. **Results:** A description of the actual results of overall student performance gathered from the summative assessment(s). (see III.b.)

Students in the capstone do well in completing the project.

Information on the summative assessment process for Electromechanical Engineering is being collected. Indirect information is solicited from students to refine the course content. The department is moving toward a broader scope to reflect the new initiatives in industrial automation and control technology. The summative assessment process will reflect these new initiatives.

The majority of students find employment in the Miami Valley region. A few are placed in Michigan and Illinois, but most graduates don't move out of the area.

- V. **Analysis/Actions:** From analysis of your summative assessment results, do you plan to or have you made any adjustments to your program learning outcomes, methodologies, curriculum, etc.? If yes, describe. If no, explain.

Yes, we consistently upgrade and improve course content to reflect the evolving needs of Miami Valley businesses.

The department is working on broadening the scope of existing courses to cover more industrial automation technologies. The department has increase student exposure to computer and Internet technology to strengthen our students' technical expertise.

The department attempts to maintain state-of-the-market technology, with many changes required on a less-than-one-year cycle.

- VI. **General Education:** Are you using any tool(s) to assess any of the three primary general education outcomes* (communication, thinking, values/citizenship)? If so, describe.

Engineering technology students need background in mathematics and reading. Many have chosen engineering technology because of its hands-on focus and perceptions of fewer general education requirements. Many of them need to improve their oral and written communication skills.

- a. Where within the major do you assess written communication? Describe the assessment method(s) used. Describe assessment results if available.

The new curriculum focus has required them to write reports, pointing to the need to upgrade those skills.

- b. Where within the major do you assess oral communication? Describe the assessment method(s) used. Describe assessment results if available.

In appropriate classes, students make oral presentations of related technical chapter topics.

- c. Where within the major do you assess thinking? Thinking might include inventing new problems, seeing relationships and/or implications, respecting other approaches, demonstrating clarity and/or integrity, or recognizing assumptions. Describe the assessment method(s) used. Describe assessment results if available.

Students use logical steps to solve problems and complete projects. Students are taught how to organize a project. Thinking skills are honed by applying troubleshooting principles to diagnose problems and isolate system faults.

- d. Where within the major do you assess values/citizenship/community? These activities might include behaviors, perspective, awareness, responsibility, teamwork, ethical/professional standards, service learning or community participation. Describe the assessment method(s) used. Describe assessment results if available.

Teamwork and group participation is required in many of the courses. The department encourages sponsors student teams to compete in various professional society events such as the Society of Manufacturing Engineers' Robotics competition.

- * Note: The oral communication checklist and the written communication checklist developed by the General Education Committee were adopted for college-wide use during the 1997-98 academic year by Academic Council. Thinking Guidelines developed by the General Education Committee are being piloted by faculty during the 1998-99 academic year.

The Aviation Technology program has partnered with the Science, Engineering Mathematics, and Aerospace Academy (SEMAA) to develop a pathway for Dayton area youth to pursue aerospace education. In addition, we have reached beyond the local region to Warren County where we have developed an articulation agreement to grant some college credit to their High School students that take the aviation program at Warren County Career Center. The Aviation Technology program has joined the Ohio Council on Aviation Education. Through this important organization of Ohio colleges, the birthplace of aviation is being promoted as the one of the premiere providers of aviation education in the state.

- II. **Program Learning Outcomes:** A description of what you intend for students to know (cognitive), think/feel (affective), or do (psychomotor), when they have completed your degree program. A suggested manageable number of outcomes should be in the range of five to ten. Describe Program Learning Outcomes review activities.*

An entry-level graduate with an Associate of Applied Science Degree in Aviation Technology from Sinclair Community College will be able to:

Learning Outcomes	Related Courses
1. Use analytical and scientific problem solving skills to model the physical environment and predict results using variable input data.	AVT 206, 247
2. Apply aeronautical knowledge to analyze aviation technology issues, determine solutions, and assess feasibility.	AVT 125, 205, 206, 211, 238, 240, 242, 245, 247
3. Present technical findings and results using industry approved publication guidelines and presentation methods.	AVT 205, 206, 211, 240, 242, 245, 247
4. Explain the functional requirements and the duties of the occupational specialties employed by the aviation industry.	AVT 125, 211, 240, 242, 245

An entry-level graduate with an Associate of Applied Science Degree in Aviation Technology with the Professional Pilot Option from Sinclair Community College will be able to:

Learning Outcomes	Related Courses
1. Private pilots will apply basic aeronautical knowledge to solve navigation problems, determine weight and balance parameters, and interpret meteorological conditions in order to operate an aircraft in accordance with the regulations specified by the FAA.	AVT 110, 120, 124, 125, 257
2. Instrument pilots will master attitude instrument flying techniques, precisely control the aircraft solely by reference to the aircraft's instruments, and plan flight scenarios including the evaluation of weather phenomena.	AVT 160, 220, 224, 257
3. Commercial pilots will analyze aircraft performance capabilities, assess take-off and landing requirements, and operate complex aircraft with advanced avionics, constant speed propellers, and retractable landing gear.	AVT 125, 211, 205, 206, 238, 240, 242, 247, 250, 253, 263
4. Multi-engine pilots will master the complexities of multi-engine flight including the ability to respond appropriately to the loss of one engine. They will assess take-off, climb, and landing performance parameters for diverse runway and atmospheric conditions using aircraft performance tables.	AVT 211, 255, 256, 266
5. Certificated flight instructors will demonstrate the ability to teach aviation concepts and basic flight techniques to student pilots..	AVT 205, 211, 240, 242, 258, 259, 269

III. Assessment Method(s): A measurable indicator of success in attaining the stated learning outcome(s). The methodology should be both reliable and valid. Please describe in detail.

- a. **Formative Assessment Method(s) and Description:** a measurable indicator of student in-progress success in attaining the stated learning outcome(s).

Formative assessment is completed on a course-by-course basis. Courses use tests and projects to assess student learning. The AVT classes are limited in size to allow for hands-on coursework. Each course uses teamwork and simulation exercises to create a learning environment within the context of aviation. Students work in teams to solve problems like analysis of weather scenarios for flight operations.

- b. Summative Assessment Method(s) and Description: a measurable indicator of end-of-program success in attaining the stated program learning outcomes(s).

The Professional Pilots demonstrate achievement of course objectives by adhering to strict FAA standards and passing practical examinations administered by the FAA.

- IV. **Results:** A description of the actual results of overall student performance gathered from the summative assessment(s). (see III.b.)

Sinclair flight students consistently exceed the national average for flight hours to complete FAA ratings. For example, our Private Pilot students are granted FAA approval after only 50 hours of training compared to a national average of 75 hours.

- V. **Analysis/Actions:** From analysis of your summative assessment results, do you plan to or have you made any adjustments to your program learning outcomes, methodologies, curriculum, etc.? If yes, describe. If no, explain.

The program was overhauled in the summer of 2001 in order to improve learning outcomes, improve methodologies, and add to the curriculum. The new curriculum will be closely monitored to ensure that the new objectives are met. If required, additional improvements will be implemented.

- VI. **General Education:** Are you using any tool(s) to assess any of the three primary general education outcomes* (communication, thinking, values/citizenship)? If so, describe.

Written and oral communication skills are stressed.

- a. Where within the major do you assess written communication? Describe the assessment method(s) used. Describe assessment results if available.

Written communication skills are stressed.

- b. Where within the major do you assess oral communication? Describe the assessment method(s) used. Describe assessment results if available.

Oral communications are stressed in all flight classes. Student presentations and group projects are emphasized in many of the other courses..

- c. Where within the major do you assess thinking? Thinking might include inventing new problems, seeing relationships and/or implications, respecting other approaches, demonstrating clarity and/or integrity, or recognizing assumptions. Describe the assessment method(s) used. Describe assessment results if available.

The navigation science courses, accident investigation, and human factors courses place emphasis on student thinking.

- d. Where within the major do you assess values/citizenship/community? These activities might include behaviors, perspective, awareness, responsibility, teamwork, ethical/professional standards, service learning or community participation. Describe the assessment method(s) used. Describe assessment results if available.

These attributes are assessed in the Gen Ed courses we require. The Accident Investigation course and some of the flight courses also develop these values..

- * Note: The oral communication checklist and the written communication checklist developed by the General Education Committee were adopted for college-wide use during the 1997-98 academic year by Academic Council. Thinking Guidelines developed by the General Education Committee are being piloted by faculty during the 1998-99 academic year.