

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 Automation & Control Technology 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 continues to utilize hands-on assessment through student involvement in laboratory 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.

The department uses projects in multiple courses. 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.

EGR students demonstrated their high achievement at the 2002 Robotics International/Society of Manufacturing Engineer's (RI/SME) Robotic Technology and Engineering Challenge in Rochester, New York by winning Gold and Bronze medals (1st and 3rd in the nation!!).

- 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 students to showcase their strengths and demonstrate proficiency in the knowledge and skills acquired in the program. The department chairperson interviews students who have successfully completed EGR 278 to assess the department's performance in providing learning opportunities for the Engineering Division's Core Competencies.

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

Faculty evaluate the results of multiple assessment strategies using the Engineering Technology Division's Core Competencies as a benchmark. They are also exploring the *True Outcomes* assessment system as a means of putting a more quantitative approach in place.

The majority of students find employment in the Miami Valley region.

- 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.

Program faculty consistently upgrade and improve course content to reflect the evolving needs of Miami Valley businesses.

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

The department attempts to maintain state-of-the-market technology in their laboratories 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.

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

To be effective in today's industrial climate students need the ability to express themselves by using both written and oral communication skills. Technical reports and projects are assessed as a part of the normal grading process in the program.

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

To be effective in today's industrial climate students need the ability to express themselves by using both written and oral communication skills. In appropriate classes, students' oral presentations are assessed as a part of the normal grading process in the program.

- 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. Thinking skills are assessed by evaluating students' application of 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 are required in many of the courses. The department encourages and sponsors student teams to compete in various professional society events such as the Society of Manufacturing Engineers' Robotics competition.