

In addition, faculty expertise coupled with input from major employers such as Delphi, Wright Patterson Air Force Base, and Meade have influenced the development of the program.

The national expectations of employers has changed resulting in a need for quality professionals to be able to deal with productivity improvements, waste reduction, and safety issues. The program faculty plan to review and revise the curriculum to reflect these national trends.

Master syllabi were last reviewed and revised in 2003, primarily to meet TAC/ABET requirements.

- 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.*

Learning Outcomes were reviewed and revised in 2004 to meet TAC/ABET requirements.

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

Learning Outcomes	Related Courses
1. Apply skills to the management of a quality program.	QET 101, 221,223,295, 231, 215, 225, 245
2. Design, implement, and verify the effectiveness of a quality system.	QET 221, 223, 295, 224, 231, 225, 235, 245
3. Plan, control, and assure product and process quality.	QET 100, 101, 105, 113, 120, 211, 217, 221, 295, 114, 123, 24, 125, 126, 225, 245
4. Analyze a product using the tools of reliability and risk management.	QET 211, 212, 295, 215, 225
5. Apply problem solving and quality improvement tools and processes.	QET M30, 101, 201, 212, 261, 295, 225,; IET 130
6. Apply qualitative methods including prediction, experimental design, data selection, collection, and statistical analysis to the improvement of a product or process.	QET 101, 132, 133, 201, 202, 212, 217, 261, 295, 215, 225,; IET 130

Learning Outcomes	Related Courses
7. Apply statistical process control techniques and capability analyses to determine the state of statistical control and conformance to product and process requirements.	QET 101, 201, 261, 225
8. Adapt current knowledge to the applications of mathematics, science, engineering and technology.	QET M30, 100, 105, 113, 120, 132, 133, 202, 212, 217, 261, 295, 114, 123, 124, 125, 126; MET 104
9. Function effectively on teams.	QET M30, 101, 132, 133, 201, 202, 211, 212, 217, 221, 223, 261, 231; MET 104; PSY 229; IET 130
10. Communicate effectively.	QET M30, 100, 101, 132, 133, 201, 202, 211, 212, 217, 221, 223, 261, 295, 231, 270; MET104, 198; COM 206; ENG 121, 122, 113; DRT 196, 198; IET 198
11. Engage in life long learning	QET 105, 211, 212, 221, 261, 215, 225, 235, 245, 270
12. Understand professional, ethical, and social responsibilities	QET 101, 105, 211, 212, 223, 261, 295, 231, 123, 124, 125, 126, 215, 225, 235, 245, 279; MET 104
13. Demonstrate respect for diversity and a knowledge of contemporary professional, societal, and global issues	QET 101, 105, 295, 215, 225, 235, 245, 270; MET 104; PSY 229; COM 206; EGR/HUM 132; PSY/SOC Elec.

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. Students in MET 104 complete small projects. All 200-level courses incorporate teamwork and some 100-level courses do also. Hands-on labs are used in nearly every course. The QET 131-132-134 sequence has labs where students use equipment to do materials testing. Students are also assessed through tests and quizzes. Eleven NCE/AME modules have been adopted in the program. Projects at the end of courses frequently integrate contexts across several courses.

The IET program faculty are using the Engineering Division's course and faculty evaluation form as a formative assessment tool. This new tool includes section on the instructor as well as specific questions about the course, facilities and

equipment, and the students. This tool offers faculty better feedback in terms of being able to improve their courses.

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

Summative assessment is completed through capstone courses. The Quality Assurance Option (QASO) uses QET 211 and 212 as capstones. In these courses students are required to complete a project in which they apply previously acquired knowledge and skills. Students examine a product and determine the design capability with respect to the failure modes, effect analyses, and a study of the criticality of failures. Students work in teams and are assessed on their contributions as a team member as well as their individual contributions.

Students who are taking the core QET program complete QET 295, Quality Seminar. Students work on interventions, selecting a problem, and designing an intervention plan. Projects focus on solving a major problem in the student's company or in society. Students also complete a written research paper and develop and present an oral report.

The department also conducts a survey of graduates of the program regarding their level of achievement in the Engineering Divisions' core competency areas. The department chairperson conducts exit interviews with all Quality Engineering graduates

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

QET 295 continues to evolve in response to national trends in the field. Student response has been positive and they view the application of problem solving skills as quite valuable. Feedback from employers is also positive. Approximately 30% of the capstone projects have been implemented at the student's workplace. The current Spring 2002 class has had 100% implementation of the projects. JIM WILL CHECK ON THIS NUMBER

In QET 211, 212 students do well in the course assessments. Students work on a project and apply their techniques in class. Students and employers concur this is a valuable learning activity.

There is consistently good feedback from employers. Those students in the QASO and QET programs do exceptionally well. Graduates have a high employment rate.

- 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 department has incorporated more outcomes based assessment within the curriculum. Eleven of the NSF modules are now included in the curriculum. Curriculum and outcomes were reviewed and revised based on TAC/ABET requirements.

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.

Writing is reinforced throughout the program through the use of required written laboratory reports in every QET lab course. Research papers are also required in some classes. The QET department rubric is used to assess group presentations in four courses within the program.

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

Oral communication skills are emphasized through the Communications general education requirement. The department had previously discussed changing the Communications requirement to COM 206 (Interpersonal Communication) from COM 211 (Speech) but has decided to give students a choice. The QET department rubric is used to assess group presentations within four courses 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 have to apply problem-solving skills in all QET courses. Students work with ill-structured, complex, and contextual problems.

- 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.

Values/community/citizenship skills are reinforced through informal discussions in courses. Professionalism and ethics are a part of MET 104 and QET 221. Students use teamwork self-assessment.

* 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 were piloted by faculty during the 1998-99 academic year.