



development is an industrial electronics technician certification program that will consist of 4-5 courses.

The department has a new goal of placing the entire EET program on line as a distance learning option. EET 104 is already available to students on-line. This course for non-electronics majors incorporates the lab component through use of a lab kit.

Master syllabi have been reviewed and are up-to-date.

**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.\*

The program learning outcomes haven't changed since the last interview. Courses within the curriculum which meet those outcomes have been modified as indicated below.

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

Learning Outcomes	Related Courses
1. Develop mathematical skills in algebra, trigonometry and calculus using analytical problem solving methods.	MAT 131, 132, 133
2. Demonstrate electronic drafting techniques for schematics and layouts using CAD system.	EET 116
3. Apply the principles of DC and AC circuits, instrumentation, analog and digital electronics, microprocessor fundamentals and applications, and circuit assembly to make pre-production prototypes.	EET 150, 114, 121, 155, 201, 202, 205, 207, 231, 251, 252, 261, 262
4. Demonstrate computer literacy and write programs to solve engineering problems using QBASIC language.	MET 198; EET 259, 261, 262
5. Demonstrate principles of electronics in latest technological fields like lasers and fiber optics, programmable logic controllers, electronic communication, computer troubleshooting and repair.	EET electives

Learning Outcomes	Related Courses
6. Demonstrate principles of technical physics and technical chemistry.	PHY 131, 132
7. Capstone course, design project.	EET 278

An entry-level graduate with an Associate of Applied Science Degree in Electronics and Computer Engineering Technology, Telecommunications Option from Sinclair Community College will be able to:

Learning Outcomes	Related Courses
1. Develop mathematical skills in algebra, trigonometry, and calculus using analytical problem solving methods.	MAT 131, 132, 133
2. Demonstrate electronic drafting techniques for schematics and layouts using the CAD system.	EET 116
3. Apply the principles of DC and AC circuits, instrumentation, analog and digital electronics, microprocessor fundamentals and applications, lasers, measurement techniques, data communication, and circuit assembly to make pre-production prototypes.	EET 150, 114, 121, 155, 201, 207, 226, 227, 231, 251, 261, 283, 284, 285
4. Demonstrate computer literacy and write programs to solve engineering problems using QBASIC language.	MET 198; EET 259, 261, 262
5. Demonstrate principles of technical physics.	PHY 131,132
6. Capstone course, design project.	EET 287

**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).

Both knowledge and skill competencies are defined for each EET course. All courses assess skills through quizzes, a mid-term exam and a final exam along with completion of a course project. The beginning level courses require group projects while the advance courses require individual design projects. Every two hundred level EET course has a design project for application at the end of the course. In addition, every

EET course has a laboratory examination as part of the final examination. Laboratory exercises are an integral part of each course. Departmentally developed laboratory manuals are available for each course. All courses require students to use simulation and analysis software.

A pilot is being conducted in EET 150 (Electric Circuits and Instruments I) to require team projects. Students would be required to complete a term project which includes writing a paper and giving a presentation.

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

EET 278 is the capstone course for EET majors. The capstone course has been modified into one course. EET 287, Telecommunication Project, is the capstone course for the Telecommunications Option. Capstone courses have been part of the program since the winter quarter of 1995. Based upon the department's experience in offering these courses as capstone vehicles, the department has met several times to discuss changes in the capstone component.

EET participates in the Tech Prep program. All Tech Prep students are required to complete a co-op experience in a local industry. It is proposed to introduce EET 270 (EET Internship) as an elective for all students so that real-world experiences are emphasized.

Since 1999, capstone projects from all Engineering Technologies programs are displayed in Building 12 at the end of the spring quarter. This display coincides with combined advisory board committee meetings. The students will get to showcase their work and the results will be available to other departments on campus.

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

In the capstone course, the design part has been made optional for students. EET technicians are seldom required to do electrical design; therefore, the assessment course has been revised to match the job description and job requirements. The changes were made effective Fall of 1999.

Feedback from transfer programs at UD, from employer surveys, and from graduates has been very positive. The department has a good placement rate and employers indicate that SCC students do not need additional training on using equipment when they begin their jobs.

A large number of students have signed up or transferred for the dual admission with University of Dayton in the Electronics and Computer Engineering Technology program.

- 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.

After offering the two-sequence capstone courses for several years, it was decided that the review component in EET 287 should be made a self-study project for students. Using EET 288 as a program curriculum review was not cost-effective for students nor was it useful to the department. The new capstone (EET 278) prepares students to take the national certification examinations as a benchmark. The revised capstone course is a four-credit hour course that emphasizes assembly, testing, and troubleshooting of a project. The new capstone course was in place for Fall of 1999. Review, via self-study of learning outcomes provided by the instructor, is now the responsibility of the student and no longer part of the capstone course. The choice to test or the outcome of the testing does not affect the graduation status of the student.

IET 198, Computer Programming Applications in Engineering Technology, has been dropped as a degree requirement and the department has adopted MET 198, Personal Computer Applications in Engineering Technology, to replace it. That will allow the students to have more exposure to report writing and development of those skills. In addition, CHE 131 was dropped from the program. Two EET electives have been added to the program.

The department is working with a number of college initiatives including the learning college, Internet courses and multi-media delivery. The courses are still traditional in terms of content, but the department is using as many alternative methods as possible to reach students who don't respond well to pencil and paper. A larger lab component is also being emphasized in each course.

The Engineering Technologies Division has been awarded a Learning Challenge grant to develop "A Computer Based Model for Outcomes Assessment and Student Retention through Continuous Feedback." EET is the lead department for the grant which includes all TAC/ABET accredited programs in Engineering. The project is aimed at developing and implementing a computer based system to provide feedback to students about his/her learning on a continuous basis to allow for timely corrective measures to be taken that will improve course completion and retention.

The department has developed an articulation agreement with the University of Toledo for a four-year distance learning program in Electronics and Computer Science.

**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.

Every course requires students to write at least three technical lab reports. The MET 198 course was added to the degree for that purpose. EET 116 also has a writing component which prepares students. EET 278 uses a required technical writing textbook. The department found that they needed to reinforce writing skills after ENG 121 and 122 (Technical Writing I & II) so they worked with the English

department to re-vamp those courses. The department uses the written checklist to measure skills in the capstone course.

- b. Where within the major do you assess oral communication? Describe the assessment method(s) used. Describe assessment results if available.  
The pilot being conducted in EET 150 requires students to give class presentations. Oral presentations are part of the capstone; every student writes a technical report and gives a 5-10 minute oral presentation at the end of the project work. The department uses the oral communication checklist to measure skills in the capstone course.

- 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.

Thinking skills are incorporated into every course. The department uses an integrated approach to developing thinking skills. Students study a topic in lecture and then apply logical thinking by using simulation software to solve problems. Lab exercises develop analytical and trouble-shooting skills. Creative thinking is often evidenced in the capstone course through completion of work-related projects that are pursued at the option of the student.

- 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.

The IEEE student chapter hosts speakers every quarter that address values and ethics within the industry. Students have been involved in community service through volunteering to upgrade emergency alert systems by Professor Lynden McIntyre. Students who complete work-related projects in the capstone course return use of their expertise back to the community.

- \* 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.