

PROGRAM REVIEW
Southern West Virginia Community and Technical College
Programs Without Specialized Accreditation

Summary of Findings
2011-2012

Program Name: Electrical Engineering Technology, Certificate Program

Hours Required for Graduation: 30

I. Synopses of significant findings, including findings of external reviewer(s)

A. Adequacy

- The curriculum has adequate requirements that meet the needs of business and industry.
- The program has established goals and objectives.
- Provides a variety of skilled job pathways.
- Entrance abilities for the students are within community college standards.
- The program has appropriately trained faculty.
- The program maintains appropriate assessment tools.

Conclusion: Program meets and exceeds minimum adequacy requirements.

B. Viability

- The program is at capacity for enrollment.
- Graduates are within expectations for the program.
- Previous history of the program indicates future students seeking the degree will increase.
- The program is the first year of the associate degree program.

Conclusion: Program meets and exceeds minimum viability requirements.

C. Necessity:

- The program meets a validated industry demand.
- The graduates find successful gainful employment.

Conclusion: The program meets minimum requirements for necessity.

D. Consistency with Mission:

- The program does support the mission and vision of the institution.
 - The program and core courses support the compact.
- There is limited impact on other programs.

Conclusion: The program is consistent with the mission of the college.

II. Plans for program improvement, including timeline.

Budget for the program is spent each year on upgrades for software and purchasing of additional simulators.

Additional efforts are being made on tracking and advising students to assist with completion of courses in sequence. Interventions are being made with regards to math courses to assist earlier. The math department is working with the program for “just in time” learning to enhance math background on the math courses. Additional efforts are being made to track students beyond graduation. Activities are ongoing.

II. Identification of weaknesses or deficiencies from the previous review and the status of improvements implemented or accomplished.

The last program review was the initial post audit conducted in 2007. The review cited a recognized weakness due to faculty turnover and a lack of assessment plan. A follow-up was completed in 2008 and the program was continued with no further corrective actions. Since the last review, the program has maintained consistent faculty, created and assessment plan, purchased new lab equipment, and has the highest enrollment in the history of the program.

IV. Five year trend data on graduates and majors enrolled

The majority of students do not list the certificate as their intended major. All graduates have continued on to the associate degree. Data trends for the associate degree program have typically been cyclical however the past three years have shown steady growth. It is expected that the program will maintain a steady stream of students. The graduation rate also follows that of the associate degree. The program has had a record number of graduates and it is expected that the trend in graduates will continue to be cyclical and within expectations.

V. Summary of assessment model and how results are used for program improvement

The assessment model contains a variety of measurements for classroom performance. Student advising and progress toward graduation is monitored by the department chair along with regular consultation with the program faculty. Outcomes are discussed at each department meeting and changes in delivery and content are made accordingly. Formal curriculum changes are presented in accordance with the established institutional policy and procedures for curriculum and instruction.

VI. Data on student placement

All of the graduates have continued on with the associate degree. There is no data specific for certificate students on job placement. Graduates who actively seek electrical related jobs have obtained high quality jobs that pay good wages and have reasonable benefits. The majority of graduates are employed in the mining industry and obtained higher than usual starting salaries. Average starting salary is approximately \$52, 000.

VII. Final Recommendation Approved by the Governing Board

See the attached resolution for Board of Governors Final Recommendation and signatures.

PROGRAM REVIEW
Southern West Virginia Community and Technical College
Programs Without Specialized Accreditation
2011-2012

Program: Electrical Engineering Technology, Certificate Program

Date of Last Review: 2007 Initial Post Audit with a 2008 Follow-up Report

I. PROGRAM DESCRIPTION

The Electrical Engineering Technology (EET) Program is a broadly based technical program. The Electrical Engineering Technology, Associate in Applied Science program has been in existence at Southern since fall 1993. The certificate program was created in 2005. A post audit was completed in 2007 and a follow-up report completed in 2008. The program's mission is to provide students with an academic and technical education with sequential/practical instruction for the development of the student as a mature, responsible engineering technician. It is designed to provide individuals basic skills necessary to enter the workforce in the areas of basic electronics.

II. SPECIALIZED ACCREDITATION INFORMATION

This program does not have any specialized accreditation information.

III. PROGRAM STATEMENT on Adequacy, Viability, Necessity and Consistency with College Mission.

A. Adequacy

1. Curriculum

The certificate program originally incorporated basic and advanced courses in electricity. Students had the option of choosing between Electrician Technician with a focus on circuit analysis and Mining Electrician with a focus on mine electricity. In the 2007-2008 academic year the curriculum was changed to remove the option choices and just focus on the core requirements that cross all options of the associate degree program. After reviewing the curriculum it was found impossible for students to graduate with the certificate in one year due to course sequencing and scheduling. The new curriculum requirements are now aligned with the first year sequence of the associate degree program.

The curriculum for the certificate program in Electrical Engineering Technology currently consists of 30 credit hours. These include 10 credit hours in a general education core and 20 hours in technical core. It is designed to be the first year of the Electrical Engineering Technology, Associate in Applied Science program. The curriculum can be found in Appendix I.

2. Faculty

The program utilizes full-time faculty to teach the general education course requirements. In addition, the program utilizes one full time faculty member and adjuncts as needed for the technical courses. During the last review the program had suffered problems due to faculty turnover. In 2007, William Moseley, a retired engineer from Appalachian Electric, was hired. The program now maintains a steady enrollment often reaching capacity. Mr. Moseley's Faculty data sheet can be found in Appendix II.

3. Students

A. Entrance Abilities

Southern maintains an open door policy for admissions. Any prospective student with a high school diploma or GED may take classes at Southern. All entering students must satisfy a general math and English requirement or take Transitional Studies courses to bring their skills to prerequisite levels of performance. The ACT test can be used to evaluate student placement or performance or the ACCUPLACER test can be taken on campus. Students are expected to start college level math during their first semester. Students requiring transitional studies math will require additional semesters to graduate.

B. Exit Abilities

Upon completion of the degree requirements, students will have acquired the necessary skills to qualify for some entry level positions in the electronics industry that require an education beyond high school. Students leave the program with an understanding of the need to continually upgrade their skills and further their knowledge and abilities through on-the-job training, continuing education, seminars, and advanced studies. Students also have the ability to continue seamlessly into an associate degree.

Specific Exit Abilities of Graduates include:

- work cooperatively with others in a team environment
- analyze, construct and test DC circuits using both fundamental and advanced techniques
- analyze, construct and test AC circuits using both fundamental and advanced techniques
- use computer programs to model, analyze and design electronic and electrical circuits
- analyze, construct and test electrical circuits utilizing skills gained through course work and instruction
- analyze, design and construct fundamental semiconductor circuits

4. Resources

A. **Financial**

This program does not have any specific budget. It is included in the budget for the associate degree program which received a WV Advance grant in 2007 in the amount of \$220,000.00. The grant provided purchasing a state-of-the-art set of lab simulators. The program also receives a yearly budget dedicated to the program. Between the grant and budget the financial support has been adequate to cover any necessary needs for the program.

B. **Facilities**

This program has one dedicated lab on the Logan campus in the Allied Health and Technology Building. The lab has a variety of simulators including electrical, motors, high voltage, low voltage, and PLC's. It is set up for a capacity of 18 students. The lab is also used by the associate degree program for electrical engineering.

5. **Assessment Information**

The EET program utilizes a variety of assessment measures. Students must pass a capstone course which includes a program assessment exam. The majority of technical core courses also utilize a pre/post course exam. Student achievement in the general education and support courses is assessed in accordance with the institution's plan for assessment for such courses/programs.

All of the graduates have continued on with the associate degree. A majority of the graduates obtain both the certificate and the associate degree simultaneously. No data has been collected on the certificate program graduates. All graduates have continued on to the associate degree level. No surveys of satisfaction have been completed for the certificate graduates. The continuation to the associate degree implies a satisfaction of the program.

6. **Previous Program Reviews**

The last program review was the initial post audit conducted in 2007. The review cited a recognized weakness due to faculty turnover and a lack of assessment plan. A follow-up was completed in 2008 and the program was continued with no further corrective actions. Since the last review, the program has maintained consistent faculty, created and assessment plan, purchased new lab equipment, and has the highest enrollment in the history of the program.

7. **Advisory Committee**

The advisory committee has been expanded over the past 3 years. It operates on a more informal basis, working with local business and industry on a regular basis to identify market demands for specialization elective offerings.

8. Strengths and Weaknesses

STRENGTHS

- Student interest as evidenced by enrollment increase
- Solid, hands-on curriculum
- Transfer opportunities
- State-of-the-art lab equipment
- New computer software and simulators
- Seamless transition to the associate degree

WEAKNESSES

- Limited capacity due to lab space.
- Student skills in math result in a longer than expected completion time.

B. Viability

1. Program Enrollment and Graduates

Number of Majors per year for previous 5 years

| <u>Year</u> | <u>Enrollment</u> |
|-------------|-------------------|
| 2005-2006 | 5 |
| 2006-2007 | 9 |
| 2007-2008 | 12 |
| 2008-2009 | 19 |
| 2009-2010 | 9 |

Enrollment Trends for previous 5 years

The majority of students do not list the certificate as their intended major. All graduates have continued on to the associate degree. Data trends for the associate degree program have typically been cyclical however the past three years have shown steady growth. It is expected that the program will maintain a steady stream of students.

Number of Graduates for previous 5 years

| <u>Year</u> | <u>Graduates</u> |
|-------------|------------------|
| 2005-2006 | 0 |
| 2006-2007 | 1 |
| 2007-2008 | 6 |
| 2008-2009 | 14 |
| 2009-2010 | 1 |

The graduation rate follows that of the associate degree. Attrition of majors typically occurs during the second semester of the program with failure to successfully complete the required math component. This result is shown in the graduation rates with the higher than usual number in 2008-2009. Based on advising records, it is expected that 2011-2012 will again be higher than usual.

Enrollment Projections

Although we cannot predict large increases in enrollment in the future, there is a community employment need delivered by this program which we believe drives enrollment. Area job markets indicate a high need for electricians, especially in the mining emphasis. At present all graduates of the EET program can find employment within the local mining community, if they so desire. Projections for the future based on the current enrollment and student interest indicate the program will meet or exceed program expectations and capabilities of 15-20 students per cohort. Enrollment often declines within each cohort due to academic difficulties. Enrollment in the certificate program is usually not recorded by students as their program of study. The cohort entering fall 2011 had 19 students enrolled.

2. Program Course Enrollments

This program offers a variety of specialized courses designed specifically for the program. Courses are open to all students however the majority are taken by majors only. A complete listing of courses for the past 5 years can be found in Appendix III.

3. Service Courses

This program does not have any courses offered specific to the program that are used by other programs.

4. Off-Campus/Distance Delivery Classes

This program does not have any courses that are currently offered off-campus or by distance delivery.

5. Articulation Agreements (2+2 etc.)

Although we have no signed agreement as such with West Virginia University Institute of Technology (WVUIT), we negotiated an informal agreement in 1995. WVUIT agreed to take up to 72 hours of our class work and electives into their 4 year Bachelors in Science Electrical Engineering Technology program. Southern's EET program was modeled after WVUIT's program with similar course numbering and text books. Meetings have been held with Bluefield State and Fairmont State to create specific 2+2 agreements. These agreements are still under development.

C. Necessity

The recent resurgence of the coal industry has generated much interest in our current electrical program. Presently, our region has only one major industry, Coal, for regional employment and economic growth in the electrical industry. We must be receptive to the coal industry needs for the future. Presently the coal business needs quality maintenance workers as discussed at advisory meetings for the mining program and as evidenced in local help wanted ads. One of the major criteria for employment for electricians in the coal industry is the miner's

electrical certification. Most of our graduates are working in the service region of the college.

D. Consistency with Our Mission

This program directly supports the institution's previous compact and mission in a variety of areas. Major areas of support for the previous compact include the following:

- Courses are offered as dual credit at a number of locations. This supports compact Goal I.B.3.
- Articulation agreements exist with each of the vocational/career centers that offer comparable courses. This supports a number of compact goals including I.C.3, III.A.1, and III.D.1.
- This program provides scholarship opportunities to qualified students through the WV Science Engineering and Technology Scholarship. This supports compact goal I.D.2.
- The program was developed to address identified local/regional needs and provides academic as well as non-academic training in technical areas. This supports compact goals II.A.2. and IV.A.1.
- The program emphasizes citizenship and lifelong learning as instructed in OR 105 and supports compact goal III.E.

This program directly supports the institution's new compact and mission in a variety of areas. Major areas of support for the new compact include the following:

- Produce more graduates
 - Program advising encourages completion of degree and graduation.
- Promote Strong Employer Partnerships
 - The program is a high demand occupation needed by employers.
 - Courses provide opportunities for employers to send employees for training
- Serve More Adults
 - Includes program recruitment for older students for skills enhancement.
- Build and Maintain Facilities
 - Courses use technology

IV. Recommendation

Based on the program review, the continuation of the program at the current level of activity without corrective action is recommended. The program meets a need in the community and has sufficient enrollment and graduates to be a viable program.

APPENDIX I - Curriculum

Electrical Engineering Technology

Certificate
30 Credit Hours

Purpose

The Electrical Engineering Technology Program has the mission to provide an academic and technical education with sequential/practical instruction for the development of the student as a mature, responsible electrical technician. The curriculum incorporates basic core courses in electricity, electronics, and electrical machinery to prepare the student for entry-level concepts and jobs.

The full Electrical Engineering Technology Certificate Program is available on the Logan Campus. The Boone/Lincoln, Williamson, and Wyoming/McDowell campuses offer the program support courses only.

| Dept/No. | Title | Credit Hours |
|------------------------|-----------------------------------|---------------------|
| Support Courses | | |
| EN 101 | English Composition I | 3 |
| MT 124 | Technical Math | 3 |
| OR 105 | Orientation to Technical Programs | 1 |
| PH 200 | Introduction to Physics | 4 |
| Major Courses | | |
| DR 203 | Electrical Schematics | 3 |
| EG 103 | Electrical Calculations | 3 |
| EG 105 | Industrial Safety | 1 |
| EG 107 | Introduction to Circuits | 4 |
| EG 171 | Circuit Analysis I | 4 |
| EG 172 | Circuit Analysis II | 4 |

APPENDIX II – Faculty Data Form

Name William W. Moseley, Jr. Rank Instructor

Check one: Full-time x Part-time _____ Adjunct _____

Highest Degree Earned BSEE
Date Degree Received May, 1973
Conferred by West Virginia Institute of Technology
Area of Specialization Electrical Engineering

Professional registration/licensure _____
Years of employment at present institution 4 years
Years of employment in higher education 4 years
Years of related experience outside higher education 30 years
Non-teaching experience 30 years

To determine compatibility of credentials with assignment:

- (a) List courses you taught this year and those you taught last year: (If you participated in team-taught course, indicate each of them and what percent of courses you taught). For each course include year and semester taught, course number, course title and enrollment.

| <u>Year/Semester</u> | <u>Course Number & Title</u> | <u>Enrollment</u> |
|--------------------------------------|----------------------------------|-------------------|
| See page 2 for course listing | | |

- (b). If degree is not in area of current assignment, explain.

Degree is in the area of current assignment.

- (c). Identify your professional development activities during the past five years.
Blackboard and online course development professional development
SoftChalk software professional development

Faculty Course Loads

| Faculty | Term | Course | Title | Enrolled |
|---------------------|--------|--------|----------------------------|----------|
| Moseley, William W. | | | | |
| | 201002 | EG 171 | Circuit Analysis I | 17 |
| | 201002 | EG 172 | Circuit Analysis II | 16 |
| | 201002 | EG 181 | Analog Electronics I | 4 |
| | 201002 | EG 214 | Electrical Control Systems | 19 |
| | 201002 | EG 220 | Machines and Power Systems | 4 |
| | 201001 | EG 103 | Electrical Calculations | 19 |
| | 201001 | EG 105 | Industrial Safety | 20 |
| | 201001 | EG 107 | Introduction to Circuits | 16 |
| | 201001 | EG 171 | Circuit Analysis I | 4 |
| | 201001 | EG 172 | Circuit Analysis II | 4 |
| | 201001 | EG 210 | Troubleshooting Lab | 18 |
| | 200902 | EG 103 | Electrical Calculations | 8 |
| | 200902 | EG 106 | National Electric Codes | 9 |
| | 200902 | EG 107 | Introduction to Circuits | 8 |
| | 200902 | EG 210 | Troubleshooting Lab | 8 |
| | 200902 | EG 220 | Machines and Power Systems | 6 |
| | 200902 | EG 290 | Digital Electronics | 7 |
| | 200901 | DR 203 | Electrical Schematics | 9 |
| | 200901 | EG 105 | Industrial Safety | 11 |
| | 200901 | EG 106 | National Electric Codes | 1 |
| | 200901 | EG 181 | Analog Electronics I | 7 |
| | 200901 | EG 210 | Troubleshooting Lab | 6 |
| | 200901 | EG 298 | Capstone | 4 |
| | 200901 | EG 299 | Internship Work Experience | 2 |
| | 200901 | MT 90 | Basic Mathematics | 22 |
| | 200802 | EG 106 | National Electric Codes | 15 |
| | 200802 | EG 171 | Circuit Analysis I | 12 |
| | 200802 | EG 172 | Circuit Analysis II | 12 |
| | 200802 | EG 220 | Machines and Power Systems | 9 |
| | 200802 | EG 275 | Circuits Review | 9 |
| | 200801 | MT 90 | Basic Mathematics | 23 |
| | 200602 | MT 95 | Introductory Algebra I | 27 |
| | 200602 | MT 95 | Introductory Algebra I | 25 |
| | 200601 | MT 90 | Basic Mathematics | 22 |

APPENDIX III - Course Enrollments

| Term | Subject | Course | Title | Enrolled |
|--------|---------|--------|-------------------------------|----------|
| 200601 | DR | 204 | Computer Aided Design & Drf I | 9 |
| 200601 | EG | 103 | Electrical Calculations | 12 |
| 200601 | EG | 105 | Industrial Safety | 16 |
| 200601 | EG | 106 | National Electric Codes | 15 |
| 200601 | EG | 107 | Introduction to Circuits | 13 |
| 200602 | DR | 203 | Electrical Schematics | 12 |
| 200701 | DR | 204 | Computer Aided Design & Drf I | 6 |
| 200701 | EG | 103 | Electrical Calculations | 18 |
| 200701 | EG | 105 | Industrial Safety | 15 |
| 200701 | EG | 171 | Circuit Analysis I | 1 |
| 200701 | EG | 172 | Circuit Analysis II | 1 |
| 200701 | EG | 210 | Troubleshooting Lab | 1 |
| 200702 | DR | 203 | Electrical Schematics | 15 |
| 200702 | EG | 171 | Circuit Analysis I | 14 |
| 200702 | EG | 172 | Circuit Analysis II | 14 |
| 200702 | EG | 210 | Troubleshooting Lab | 11 |
| 200801 | EG | 106 | National Electric Codes | 1 |
| 200802 | EG | 106 | National Electric Codes | 15 |
| 200802 | EG | 171 | Circuit Analysis I | 12 |
| 200802 | EG | 172 | Circuit Analysis II | 12 |
| 200901 | DR | 203 | Electrical Schematics | 9 |
| 200901 | EG | 105 | Industrial Safety | 11 |
| 200901 | EG | 106 | National Electric Codes | 1 |
| 200901 | EG | 210 | Troubleshooting Lab | 6 |
| 200902 | DR | 204 | Computer Aided Design & Drf I | 12 |
| 200902 | EG | 103 | Electrical Calculations | 8 |