

Post-Audit Review

For Occupational Programs Implemented Under the Provisions of Series 37 West Virginia Council for Community and Technical College Education

Institution: Eastern West Virginia Community and Technical College

Program (Degree and Title): Electromechanical Technology, Certificate Program

I. Introduction

The Electromechanical Technology, Certificate Program (ELM) was created by incorporating existing courses from the Industrial Maintenance program. The Industrial Maintenance program was developed to satisfy local industry needs at that time. Several years later it became apparent that a broader approach was needed. Many industrial maintenance courses were modified and expanded to more fully train maintenance personnel and better suit the current regional needs and serve as part of the technical core for the electromechanical technology program. However, as with many industries the real push was for “skills training” and not as much interest in an academic degree, so enrollments and number of degree-seeking majors have been low.

The ELM program is an integral part of Eastern’s new Wind Technician Training Program (WTT). Many students are coming into the WTT program and are only interested in maintenance training, not necessarily Wind Turbine training. As a result, the ELM program now serves as a degree alternative to the new WTT program which will likely bolster ELM enrollments in upcoming semesters. By offering dual Electromechanical and Wind Turbine Certificates Eastern can continue to offer these courses and serve larger numbers of students.

The Electromechanical program has been integrated into the Wind Technician Training Program. As Eastern combined these offerings it was obvious that some course outcomes needed to be changed. These courses were successfully changed to meet the needs of industry by utilizing existing and new partnerships. Several meetings are held annually to review course offerings and actual course content. Through the advisement of its partners Eastern has been able to make both the Wind and the Electromechanical programs work together as well as contain trainings needed by the industries. By offering both programs on a parallel track, the program has become more interesting and useful for students.

II. Goals and Objectives

Program Goals

The program was developed with the help of local industries throughout Eastern WVCTC’s six county service district. The goals of the program were to educate individuals to help them move to higher level positions within manufacturing organizations, and to help supply future needs for maintenance technician type employees. Discussions of having “people in the pipeline” were a constant thread throughout the meetings and course development.

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Program Need

Electromechanical technicians are employed nationally in numerous diverse industries. Locally, this program addresses an unmet labor need as evidenced by the support from a variety of local industries including food processing, healthcare and woodworking and electronics manufacturing. Letters of support from local employers are available. Examples of the types of jobs graduates will be qualified for include:

1. Hydraulic/Pneumatic Equipment Maintenance
2. Plant Engineering Technician
3. Industrial Electrician
4. PLC programmer/Technician
5. Electronic Technician
6. Maintenance Technician
7. Technical Sales
8. Field Service Technician
9. Industrial Equipment Maintenance

According to the U.S. Department of Labor (www.bls.gov) job demand for electromechanical technicians is expected to grow at an average rate of 12-19% over the next eight years.

III. Assessment

The assessment of the Certificate in Electromechanical Technology will follow assessment instruments and standards to discern student academic achievement and course effectiveness in meeting the certificate goals and course outcomes.

- Throughout the program we should expect to see 80% of students completing courses that are attempted. Completers should demonstrate at least an average of 70% in each course through classroom assessments.
- Drop Rate: The drop rate is not expected to exceed 30%.
- Course-level effectiveness: Course outcomes for all of the Electromechanical Technology courses will be assessed. At least five outcomes from each course will be assessed. Exam questions linked to course learning outcomes will be included in the final exam.
- Persistence Rate: Students in the Certificate in Electromechanical Technology will be tracked throughout their certificate program to determine persistence through Certificate completion.
- Graduation Rate: At least 70% of students enrolling in the Certificate in Electromechanical Technology will successfully complete the certificate within a reasonable time based on full-time or part-time implementation. This will be measured by the number obtaining the Certificate.

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- Syllabus Analysis: Syllabus analysis will be conducted on an annual basis to assure consistency of outcomes with Master Course Record Forms and among sections of specific courses.
- Transcript Analysis: Transcript analysis will be conducted as triggered by deficiencies in course level assessment activities.
- Advisory Committee Review: Annual advisory committee review will provide qualitative evaluation of program effectiveness in meeting regional paraprofessional educator needs.
- Course evaluation surveys will be used as indirect assessment measures of student success and satisfaction.
- Graduate Placement Rate: Tracking of students completing the Certificate will be done by a survey to determine the number of graduates obtaining employment in their field of study. The survey will include questions to collect data on location, salary, job preparedness, and reasons why graduates are not working in their field if applicable.

Note: The technical core has not been assessed as originally proposed since there has been a small number of Certificate Graduates.

IV. Curriculum

- A. Include a summary of degree requirements (including entrance standards and exit standards) and provide commentary on significant features of the curriculum.
- B. Provide a list of courses along with the number of credit hours required for each course. Include specific course titles and numbers. Label as Appendix I.
- C. Submit a listing of the course delivery modes.

A. Summary of Degree Requirements

The Electromechanical Certificate program requires students to be capable of computations in Algebra as well as reading comprehension and communications. Significant features of the ELM program are the actual hours of “hands on” experience. Many of the students entering these certificate programs are tactile learners and do not do well in lecture only courses. We have designed the courses to not only teach basics and fundamentals, but to help students understand why they need to learn these functions.

- B. The courses lists with credit hours are listed in Appendix I.

C. Course Delivery Modes

These courses all have a lecture and then a laboratory component where students get real hands on experience working on systems and equipment. They learn basic electricity, hydraulics, pneumatics and maintenance principles. These were areas that were very important to our advisory group.

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V. Faculty

Submit information on the total number of full-time and part-time faculty utilized per year to deliver the program. Use Appendix II forms. The narrative should summarize points relating to faculty teaching courses within the major (percentage of faculty holding tenure, extent of use of part-time faculty, level of academic preparation, etc.) Data on part-time faculty may be abbreviated, but should minimally include academic degree held and list of courses taught.

The Electromechanical Certificate Program currently utilizes part time adjunct faculty for all of the technical courses. Typically Eastern offers 3-4 courses in the fall and 4 in the spring semester. We currently employ 5 adjunct faculty to teach our ELM and Wind Turbine Technician Courses. As mentioned above these programs closely parallel each other and share many courses. Data on individual instructors, their education and course taught are contained in Appendix II. All of our adjunct instructors have many years of professional experience ranging from 7 – 30 years in industry and 1 to 7 years in educational settings. A typical adjunct will have more than 5 years of industrial and commercial experience. These adjuncts have also performed contracted training services for our local industries as well as continuing education trainings for the public.

VI. Enrollment and Graduates

A. Submit data indicating the headcount and full-time equivalency (FTE) enrollment along with the number of graduates for each year the program has been in existence. Label as Appendix III.

Data on headcount and graduates is contained in Appendix III.

Electromechanical students have typically been industrial employees and in many cases were not interested in a degree or certificate. Their main interest was getting the skill, some employers pay on the basis of skills only and not a full program. The number of students enrolled in electromechanical courses has increased due to the requirements of the Wind Technician Program.

B. Provide information on graduates in terms of places of employment, starting salary ranges, and number employed in the field of specialization. Include evidence and results of follow-up studies of graduates and employers. The studies should indicate graduate and employer satisfaction with the effectiveness of the educational experience. A summary of the results to be included should indicate the number of individuals surveyed or contacted and the number of respondents.

Students graduating the ELM and WTT programs are being employed in maintenance, wind maintenance, and mining areas. Their salary ranges from \$15/hour to as much as \$28/hour. Currently we have students working for Edison Mission Power, Mettiki Coal, American Woodmark Corporation and HP Hood Incorporated.

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- C. Present information on the success of graduates in achieving acceptance into baccalaureate programs.

To date students have not continued their education beyond our programs to pursue a baccalaureate degree. This program was designed as a terminal degree program and targeting employment opportunities. It has not been designed as a 2+2 however, some courses are transferable.

VII. Financial

- A. Indicate the annual total expenditures to deliver the program and source(s) of funding for the program. Include departmental resources, state appropriated funds, grants and contracts, state funds and student fees.

Currently the faculty salaries are being paid as part of Eastern's Wind Turbine Technician program grant, although there is sufficient enrollment to pay for the continuation of course offerings. This enrollment increase is largely due to the Wind Turbine Technician program enrollment. Total cost to operate the program strictly speaking of salaries is \$7000. Eastern does lease a separate facility for the technical programs, which is an additional expense shared by the Electromechanical, Wind Technician, CDL truck driving, Adult Basic Education and Automotive programs. The facility is on a lease to own situation costing \$60,000 per year.

- B. Identify projection of future resource requirements and source of funding. Funding to operate this program.

Future operation of the program looks promising with the parallel operation of the Wind Turbine Technician Program. By sharing multiple courses with the Wind program the Electromechanical certificate is secure. Enrollment in these technical programs will help Eastern sustain our faculty and the facilities. The courses associated with the ELM program use the same facilities as the wind technician courses, therefore there is no additional facility cost.

VIII. Advisory Committee

List all advisory committee members. Provide information on how the advisory committee has been utilized for program improvement.

Because two programs have merged below are the advisory members for both the Electromechanical and the Wind Technician Programs.

Doug Vance	Edison Mission Energy, Wind Farm Manager, Berlin PA
Joseph Watts	Warrior Run Power Station, Cumberland MD
Eldridge Bright	NextEra Energy, Wind Farm Manager, Parsons, WV
Chuck Burley	Warrior Run Power Station, Cumberland MD
David Leary	Former maint. Tech. Florida Power and Light, Parsons, WV

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Grover Duling	Potomac High.Tech Prep Coord./Eastern Wind Consultant
Mike Hipp	Instructor South Branch Vocational Center
Jim Spurling	Instructor Mineral Co. Vocational Center
Chris Meehan	Invenergy LLC, Wind Farm Manager, Greenbrier Co., WV
Jeffrey F. Dearing	Regional Human Resource Manager Pilgrims Pride
Geren F. Knight	Plant Manager, Automated Packaging Systems
John W. Crites, II	President, Allegheny Wood Products, Inc
Charles H. Friddle III	Account Manager, Allegheny Power
Faron Shanholtz	Human Resources Mgr. American Woodmark Corp.
Fred Lemasters,	Human Resources Mgr. American Woodmark Corp.

The advisory committee has been instrumental in determining the course curriculum and overall content. The advisory committee was integrally involved in all levels of program development from the initially conceptualization of the program, needs assessment and curriculum content. With implementation, the program courses are continually assessed and changed at the recommendation of both the faculty and the advisory committee. Students who are working in the field have also provided recommendations to strengthen the curriculum.

IX. Accreditation

Is an accreditation process available in this field of study? If so, what is the accreditation status of the program?

There is no national standard for this type of certification.

APPENDIX I Required Courses

The Certificate in Electromechanical Technology will include the following courses:

General Education :

- ENG 101 – English Composition I 3 credit hours

Required Technical Courses:

- CIS 108 - Computer Fundamentals 3 credit hours
- WTT 110 - Wind Safety and OSHA 4 credit hours
- WTT 120 – DC/AC Circuits 4 credit hours
- WTT 160 – Power Generation and Transmission 4 credit hours
- WTT 150 - Electrical Practical Applications 4 credit hours
- ELM 120 – Fundamentals of Fluid Power 3 credit hours
- ELM 217 – Industrial Maintenance Fundamentals 3 credit hours
- ELM 210 – PLC Fundamentals 3 credit hours
- IT 180 - PC Repair and Maintenance 3 credit hours

The Certificate currently requires a minimum of 34 credit hours; however, it is under review in order to meet the new standards defined in Series 11.

**APPENDIX II
Faculty Data**

Name Michael Hipp Rank _____
 Check one:
 Full-time _____ Part-time _____ Adjunct Graduate Asst. _____

Highest Degree Earned _____ Date Degree Received _____

Conferred by _____

Area of Specialization _____

Professional registration/licensure Career Technical Education Certificate
 Master Electrician WV
 EPA Technician Refrigerant Certification

Yrs of employment at present institution 7
 Yrs of employment in higher education 7
 Yrs of related experience outside higher education 23
 Non-teaching experience _____

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>
2010 Fall	WTT-150 Electrical Pract. Apps.	8
2011 Spring	WTT-150 Electrical Pract. Apps.	4
2011 Fall	WTT-150 Electrical Pract. Apps.	11

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

Mr. Hipp is an industrial maintenance teacher at the South Branch Vocational Technical Center and has been an adjunct instructor for Eastern for seven years. He holds a Master Electrician License in West Virginia, and he is certified with the Environmental Protection Administration with a Technician Class Refrigerant Certification. Mr. Hipp has a private electrical/heating and ventilating contractors license and business. He routinely teaches industrial wiring, maintenance, as well as, hydraulic and pneumatic systems. Most recently he introduced programmable controller training to his students.

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Name Jim Spurling Rank _____
 Check one:
 Full-time _____ Part-time _____ Adjunct Graduate Asst. _____

Highest Degree Earned _____ Date Degree Received _____

Conferred by _____

Area of Specialization Electronics Technology

Professional registration/licensure Career Technical Education Certificate

Yrs of employment at present institution 10

Yrs of employment in higher education 10

Yrs of related experience outside higher education 14

Non-teaching experience _____

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>
2010 Fall	WTT-120 DC/AC Circuits	8
2011 Spring	WTT-120 DC/AC Circuits	4
2011 Fall	WTT-120 DC/AC Circuits	11

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

Mr. Spurling is a full time instructor at the Mineral County Vocational Center and has been an excellent adjunct instructor for Eastern for ten years. He has extensive professional experience in electronics troubleshooting and repair. He is a Cisco Academy Instructor for computer networking and computer repair and was trained in Electronic Product Servicing at West Virginia University Institute of Technology. He also has industrial maintenance experience working in the paper manufacturing industry. He also will be teaching a programmable controller course in the spring.

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Name Charles Landes Rank _____

Check one:

Full-time _____ Part-time _____ Adjunct Graduate Asst. _____

Highest Degree Earned BS Date Degree Received 1974

Conferred by West Virginia University

Area of Specialization Wood Industry

Professional registration/licensure _____

Yrs of employment at present institution 30

Yrs of employment in higher education 1

Yrs of related experience outside higher education 30

Non-teaching experience 38

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>
2011 Spring	ELM 120 Fund. Of Fluid Power	10
2011 Fall	ELM 120 Fund. Of Fluid Power	15
2011 Fall	WTT 210 Wind Mechanical Systems	7

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

Mr. Landes has a BS degree in Wood Industry Technologies but has been working in a supervisory and training position for most of his 30 years in industry. He routinely writes Programmable controller software, performs troubleshooting on electrical, pneumatic, and hydraulic systems. He also is quite versed in remote data acquisition and remote control of systems and processes. He has extensive knowledge in programming multi axis Fanuc robots used both to pick and place, as well as, spray painting items.

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Name Max Boward Rank _____

Check one:

Full-time _____ Part-time _____ Adjunct Graduate Asst. _____

Highest Degree Earned Masters Degree Date Degree Received 1996

Conferred by West Virginia University

Area of Specialization Safety and Environmental Management

Professional registration/licensure OSHA 10 Hour Construction Hazard Awareness
Scaffolding Competent Person Training
Mobile Crane Management Awareness
Trench and Excavation Safety 8 Hr Comp. Person
5 Hour Fall Protection Course
First Aid and CPR Trainer

Yrs of employment at present institution 4

Yrs of employment in higher education 4

Yrs of related experience outside higher education 13

Non-teaching experience 10

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>
2010 Fall	WTT-110 Wind Safety/OSHA 30	17
2011 Spring	WTT-110 Wind Safety/OSHA 30	14
2011 Fall	WTT-110 Wind Safety/OSHA 30	17

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

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**APPENDIX III
Headcount and Statistics on Graduates**

Three year trend data on graduates and majors enrolled:

	Headcount	FTE	Full Time	Graduates
Fall 2008	0	0	0	0
Spring 2009	0	0	0	0
Fall 2009	1	.2	0	0
Spring 2010	2	.8	0	0
Fall 2010	3	1.7	0	1
Spring 2011	2	1.3	0	1
Total	8	4	0	2

	Spring 2009	Fall 2009	Spring 2010	Fall 2010	Spring 2011	Total HC	Total FTE
ELM 100* (3 Cr)	3					3	1.8
ELM 105* (4 Cr)			2			2	.53
ELM 106* (4 Cr)						0	0
ELM 110* (3 Cr)						0	0
ELM 120 (3 Cr)				9	10	19	3.8
ELM 210 (3 Cr)						0	0
ELM 217 (3 Cr)		6			6	12	2.4
ELM 218* (3 Cr)			5			5	1.0
IT 180 (3 Cr)						0	0
WTT 110 (4 Cr)				20	14	34	9.1
WTT 120 (4 Cr)				8	4	12	3.2
WTT 150 (4 Cr)				5	11	16	4.27
WTT 160 (4 Cr)					8	8	2.13
Total	3	6	7	42	53	111	28.23

* Courses in program prior to revision in 2010

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