



**Electromechanical Technology  
Certificate of Applied Science (CAS)  
Program Level Assessment Plan  
June 7, 2017**

**Electromechanical Technology CAS Mission Statement**

The Electromechanical Technology (ELM) Certificate in Applied Science is a broad-based curriculum that provides instruction and practical application of a variety of concepts including electricity, pneumatics, hydraulics, and industrial controls. ELM graduates will enter the workforce at the technician level and will be prepared to assemble, install, calibrate, troubleshoot, service, and repair equipment used in industry and business. The program supports the mission by addressing the expressed need for trained professionals in the areas of plant maintenance, computer systems, programmable logic controls, technical service, sales, instrumentation, and research and development.

The program provides:

- Graduates to meet current and projected regional employment needs for electromechanical related fields.
- Provide workers with credentials for new employment opportunities.

**Electromechanical Technology CAS Program Outcomes**

Upon completion of this certificate, graduates will be able to:

1. Apply accepted safety and health practices in the workplace.
2. Demonstrate a working knowledge of the construction, operation and function of components and devices used in mechanical, electrical, and fluid power systems.
3. Apply principle, knowledge, and analysis skills in troubleshooting, repairing, and maintaining mechanical, electrical, and fluid power systems.
4. Use tools and instrumentation to troubleshoot and/or repair industrial equipment and systems.
5. Read, interpret, and design schematics and writing diagrams for mechanical, electric, and fluid power systems.
6. Apply effective written communication and computation skills.
7. Demonstrate computational skills to solve problems involving parameters contained in mechanical, electrical, electronic, and fluid power systems.
8. Demonstrate computer literacy.

**Assessment of Electromechanical Technology CAS Goals and Outcomes**

The assessment of electromechanical technical core courses is imperative and the key to curriculum improvement. Targeted courses include:

1. ELM 120: Fundamentals of Fluid Power
2. WTT 110: Wind Safety and OSHA
3. WTT 120: DC/AC Circuits
4. ELM 210: PLC Fundamentals
5. ELM 217: Industrial Maintenance Fundamentals
6. WTT 150: Industrial Motor Controls

A focus on curriculum improvements and revisions based on assessment data will help overcome traditional barriers to conducting meaningful assessment and improve student learning. Therefore, the following assessment instruments and standards will be used to determine student academic achievement and course effectiveness in meeting program-level and course-level learning outcomes.

**Completion Rate/Course Level** – At least 75% of students enrolling in ELM technical core courses will successfully complete their courses. This metric will be determined at the end of each semester based on final grades beginning in Fall 2016. Courses to be assessed in subsequent semesters will be based on the program implementation schedule.

**Drop Rate** – Beginning in Fall 2016, drop rates in ELM technical core courses will not exceed 25%.

**Course-Level Effectiveness** – Course outcomes for targeted ELM courses will be assessed on a cyclical basis based on the program implementation schedule and the Assessment Committee's Course Report Tracker. At least four learning outcomes will be assessed in each Course Assessment report and unmet learning outcomes (below 75%) will be monitored and reassessed in subsequent reports.

**Graduation Rate** – At minimum, 75% of students enrolling in the ELM program will successfully complete their certificate within three years of initial enrollment.

**Syllabus Analysis** – Syllabus analyses for all ELM courses will be conducted each semester to ensure current learning outcomes are included on all syllabi and that all syllabi are consistent across the program.

**Transcript Analysis** - Transcript analysis will be conducted as triggered by deficiencies in course level assessment activities.

**Advisory Committee Review** – On a per semester basis, the WTT/ELM Advisory committee will review and provide a qualitative evaluation of the program's effectiveness in meeting regional employment needs.

**Enrollment Patterns** – Enrollment trends will be monitored on a yearly basis. Shifts in targeted courses and enrollment numbers will trigger a detailed assessment review as defined above.

IDEA course surveys will be used as an indirect assessment measure of student success and satisfaction. IDEA survey questions will provide student feedback on the quality of learning acquired throughout the program including an understanding of intended course outcomes and overall student satisfaction with instruction and course effectiveness.

**Embedded Course Certifications and Exit Testing** – Specific technical core courses and a graduate exit exam are matched with embedded PMMI (Packaging Machinery Manufacturers Institute) certification tests, which allows for further assessment of student learning and helps ELM students earn industry certifications while enrolled at Eastern:

ELM 120: Fundamentals of Fluid Power – PMMI Fluid Power 1 Certification Test  
 ELM 150: Industrial Motor Controls – PMMI Motor and Motor Controls 1 Certification Test  
 ELM 210: PLC Fundamentals – PMMI PLC 1 Certification Test  
 Graduate Exit Exam – PMMI Industrial Electricity 1 Certification Test

Future ELM program reviews will extrapolate and analyze data based on student PMMI scores to help improve program deficiencies.

### **Data Collection**

Multiple methods will be used to collect appropriate data to assess student learning and success. Primary data will be analyzed to determine course level effectiveness. A secondary analysis of student records will be conducted to track student success, engagement, and goal attainment. Student records selected for the secondary analysis include enrollment patterns in the ELM program, course grades, drop rates, PMMI pass rates, and job attainment rates. Course mapping, the creation of task sheets, and a data analysis of PMMI scores are examples of how Eastern's assessment will be improved. Additionally, course evaluations will be conducted to address students' perceptions of success and satisfaction. These self-reports will provide a qualitative perspective of the students' "lived experience" in targeted program courses.

### **Data Analysis and Recommendations**

The Division Chair for General Studies and full-time Wind Technology/Industrial Maintenance faculty member will prepare assessment reports and recommendations. These reports will be provided to the Dean for Teaching and Learning, Assessment Committee, and the Learner Outcomes Team (LOT). Reports will address student outcomes, methods of assessment, results of assessment activities and recommendations. Course Assessment reports are distributed to all ELM faculty members. Any suggestions or comments from faculty members will also be considered for any possible changes to the course.

### **Effectiveness of Assessment Plan**

Additional methods of assessment will be added to determine student success and the effectiveness of the curriculum. The Higher Learning Commission (HLC) identifies six questions, which serve as prompts for dialog in utilization of assessment data for improvement of student learning. As trends in student academic achievement are monitored, the need for additional assessment activities or change in focus will become evident by applicability of results in curriculum revision.

Below are HLC's six fundamental questions to guide discussions for the review of assessment in support of student learning:

1. How are your stated learning outcomes appropriate to your mission, programs, degrees, and students?
2. What evidence do you that students achieve your stated learning outcomes?
3. In what ways do you analyze and use evidence of student learning?
4. How do you ensure shared responsibility for student learning and for assessment of student learning?
5. How do you evaluate and improve the effectiveness of your efforts to assess and improve student learning?
6. In what ways do you inform the public and other stakeholders about what students are learning – and how well?

**See Attachments for Program Matrix**