Wind Energy Technology
Associate of Applied Science (AAS)
Certificate of Applied Science (CAS)
Program Level Assessment Plan
June 8, 2017

Wind Energy Technology AAS/CAS Mission Statement

The Wind Energy Technology (WTT) AAS and CAS programs are broad-based curricula that provide instruction and practical application of a variety of technical concepts and practices. Courses include industry recognized maintenance practices in electrical, pneumatic, and hydraulic mechanical systems, computer control, data acquisition, and periodic/predictive maintenance program usages. The program supports the mission by addressing the expressed need for trained WTT professionals across the United States, and more importantly, many organizations within Eastern's service area.
The program provides:

- Graduates to meet current and projected regional employment needs for WTT related fields.
- Workers with credentials for new employment opportunities.

Wind Energy Technology AAS Program Outcomes

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

1. Demonstrate knowledge of electrical equipment and operations
2. Demonstrate knowledge of mechanical equipment and operations
3. Demonstrate knowledge of fluid power equipment and operations
4. Demonstrate safety practices common to the wind industry
5. Troubleshoot, repair, and maintain electrical systems common to wind power generation
6. Troubleshoot, repair, and maintain distributive power systems common to wind power generation
7. Troubleshoot, repair, and maintain hydraulic controls used in the wind industry
8. Use commonly available instruments to analyze and troubleshoot systems
9. Use schematics, operating manuals, and troubleshooting guides to troubleshoot equipment commonly used in the wind industry
10. Demonstrate climbing, rescue, and emergency medical techniques and procedures necessary for the wind industry
11. Apply safety procedures in the industrial environment including those applicable to hand and power tools

12. Demonstrate job hazard assessment and resolution to hazards
13. Apply computers in troubleshooting, maintenance planning, and report writing using application software relevant to the wind industry
14. Demonstrate proficiency in wind turbine maintenance and repair
15. Demonstrate proficiency in airfoil composite and repair
16. Demonstrate proficiency in wind turbine troubleshooting and repair
17. Communicate effectively and work collaboratively in a variety of wind related industrial settings
18. Perform daily maintenance and repair tasks necessary in the wind industry
19. Demonstrate global awareness and knowledge of human awareness

Wind Energy Technology CAS Program Outcomes

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

1. Demonstrate basic knowledge of electrical equipment and operations
2. Demonstrate basic knowledge of mechanical equipment and operations
3. Demonstrate basic knowledge of fluid power equipment and operations
4. Demonstrate safety practices common to the wind industry
5. Troubleshoot, repair, and maintain electrical systems common to wind power generation
6. Troubleshoot, repair, and maintain distributive power systems common to wind power generation
7. Troubleshoot, repair, and maintain hydraulic controls used in the wind industry
8. Use commonly available instruments to analyze and troubleshoot systems
9. Use schematics, operating manuals, and troubleshooting guides to troubleshoot equipment commonly used in the wind industry
10. Demonstrate climbing, rescue, and emergency medical techniques and procedures necessary for the wind industry
11. Apply safety procedures in the industrial environment including those applicable to hand and power tools
12. Demonstrate job hazard assessment and resolution to hazards
13. Perform daily maintenance and repair tasks necessary in the wind industry
14. Demonstrate effective communication and computer skills

Assessment of Wind Energy Technology AAS/CAS Goals and Outcomes

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

1. WTT 101: Introduction to Maintenance Technology
2. ELM 120: Fundamentals of Fluid Power
3. WTT 110: Wind Safety and OSHA
4. WTT 120: DC/AC Circuits
5. ELM 218: Maintenance Applications
6. WTT 210: Wind Turbine Mechanical Systems
7. ELM 210: PLC Fundamentals
8. ELM 217: Industrial Maintenance Fundamentals
9. WTT 150: Industrial Motor Controls

10. WTT 160: Power Generation and Transmission
11. WTT 230: Supervisory Control and Data Acquisition
12. WTT 260: Wind Turbine Troubleshooting and Repair
13. WTT 278: Wind Technology Internship II
14. ELM 276: Electromechanical Capstone

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 WTT 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 2017. Courses to be assessed in subsequent semesters will be based on the program implementation schedule.

Drop Rate – Beginning in Fall 2017, drop rates in WTT technical core courses will not exceed 25%.

Course-Level Effectiveness – Course outcomes for targeted WTT 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 WTT program will successfully complete their certificate within three years of initial enrollment. This metric will be measured by the number of graduates. For the AAS program, at least 75% of students will successfully complete the degree within four years.

Syllabus Analysis – Syllabus analyses for all WTT 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
ELM 218: Maintenance Applications – PMMI Mechanical Components 1 Certification Test
Graduate Exit Exam – PMMI Industrial Electricity 1 Certification Test

Future WTT 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 WTT programs, 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 WTT 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