

STUDENT LEARNING ASSESSMENT OVERVIEW

WIND ENERGY TECHNOLOGY

The Wind Energy Technology program at Mesalands Community College offers an educational program to meet the growing demand for trained and qualified wind energy technicians that provide maintenance on the turbines. The Occupational Certificate in Wind Energy Technology provides instruction in electrical theory and application, hydraulics theory and application, mechanical theory and application, wind energy theory, field safety theory and application, and turbine climbing and application. The Associate of Applied Science Degree in Wind Energy Technology provides instruction in wind turbine technology, turbine placement and construction, turbine operations and maintenance, monitoring and communications technology, tower safety, mechanical systems, electrical theory, power generation and distribution, hydraulics, and digital electronics in addition to those found in the Occupational Certificate. Students in these programs will be prepared for rewarding and profitable careers in this growing field.

Program Objectives

Upon completion of the Wind Energy Technology Associate of Applied Science Degree Program:

1. The student will identify electrical, mechanical, and hydraulic components found within various styles and vintages of wind machines, and demonstrate an understanding of their functions and maintenance requirements.
2. The student will differentiate between the various workplace positions of wind power facility team members, and describe the duties and responsibilities of each, including those relating to site construction and continuous operation.
3. The student will authoritatively discuss the market realities and future potential of wind energy technology and the employment opportunities it represents.
4. The student will discuss the basic advantages and disadvantages of modern renewable energy technologies, and compare them to extant non-renewable methods of energy production and conservation.
5. The student will demonstrate a functional understanding of numerous electrical concepts and components, including AC/DC theory and its application within electronic subsystems and power generation technologies.

6. The student will thoroughly demonstrate a complete understanding of workplace safety concepts and practices within the wind industry, including electrical safety, tool safety, Lock-Out/Tag Out, Personal Protective Equipment selection and use, Adult CPR, and Basic First Aid.

Program Objectives Assessment Plan

All program objectives are measured with multiple tools. The following **Curriculum Map** outlines those measurement tools and courses in which the program objectives are presented and/or measured:

Program Objective	Measurement Tools	Courses In Which Program Objectives are Presented and/or Measured
<p>1. The student will identify electrical, mechanical, and hydraulic components found within various styles and vintages of wind machines, and demonstrate an understanding of their functions and maintenance requirements.</p>	<ul style="list-style-type: none"> • Curriculum Written Tests • Curriculum Performance Tests • CAT • Pre/Post-Test • Oral Tests • Research Papers 	<ul style="list-style-type: none"> • WET 105 • WET 204 • WET 121 • WET 205 • WET 116
<p>2. The student will differentiate between the various workplace positions of wind power facility team members, and describe the duties and responsibilities of each, including those relating to site construction and continuous operation.</p>	<ul style="list-style-type: none"> • Project • Curriculum Written Tests • Curriculum Performance Tests • CAT • Pre/Post-Test • Oral Tests • Research Papers 	<ul style="list-style-type: none"> • WET 101 • WET 217

<p>3. The student will authoritatively discuss the market realities and future potential of wind energy technology and the employment opportunities it represents.</p>	<ul style="list-style-type: none"> • Curriculum Written Tests • Curriculum Performance Tests • CAT • Pre/Post-Test • Oral Tests • Research Papers 	<ul style="list-style-type: none"> • WET 101 • WET 217
<p>4. The student will discuss the basic advantages and disadvantages of modern renewable energy technologies, and compare them to extant non-renewable methods of energy production and conservation.</p>	<ul style="list-style-type: none"> • Performance Profile • Curriculum Written Tests • Curriculum Performance Tests • CAT • Pre/Post-Test • Oral Tests • Research Papers 	<ul style="list-style-type: none"> • WET 101 • WET 217
<p>5. The student will demonstrate a functional understanding of numerous electrical concepts and components, including AC/DC theory and its application within electronic subsystems and power generation technologies.</p>	<ul style="list-style-type: none"> • Curriculum Written Tests • Curriculum Performance Tests • CAT • Pre/Post-Test • Oral Tests • Research Papers 	<ul style="list-style-type: none"> • WET 105 • WET 115 • WET 205 • WET 116 • WET 219 • WET 218 • WET 217
<p>6. The student will thoroughly demonstrate a complete understanding of workplace safety concepts and practices within the wind industry, including</p>	<ul style="list-style-type: none"> • Curriculum Written Tests • Curriculum Performance Tests • CAT • Pre/Post-Test • Oral Tests • Research Papers 	<ul style="list-style-type: none"> • AHS 118R • WET 105 • WET 115 • WET 204 • WET 121 • WET 205 • WET 218 • WET 116 • WET 219

electrical safety, tool safety, Lock-Out/Tag Out, Personal Protective Equipment selection and use, Adult CPR, and Basic First Aid.		<ul style="list-style-type: none"> • WET 140 • WET 141 • WET 240 • WET 241
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General Education Competencies

Upon completion of the Wind Energy Technology Associate of Applied Science Degree Program and in addition to the above mentioned program objectives:

1. Students will read, write, listen and use verbal skills to organize and communicate information and ideas in personal and group settings (Communication).
2. Students will demonstrate mathematical principles and scientific reasoning by applying appropriate methods to the inquiry process (Mathematical and Scientific Reasoning).
3. Students will identify, evaluate and analyze evidence to guide decision making and communicate his/her beliefs clearly and accurately (Critical Thinking).

General Education Competencies Assessment Plan

General education competencies are measured with multiple tools.

The following **Curriculum Map** outlines those measurement tools and courses in which the general education competencies are presented and/or measured:

General Education Competencies	Measurement Tools	Courses In Which General Education Competencies Are Presented and/or Measured
Communication 1. Writing 2. Oral Presentation 3. Information Technology	<ul style="list-style-type: none"> • ENG 299 • CAAP • CAT • Class Presentation • Writing Across The Curriculum Rubric • Oral Presentation Rubric • Critical Thinking Rubric 	<ul style="list-style-type: none"> • ACS 100 • COM 102 • CIS 101 • ENG 102 • ENG 233 • ENG 299 • GEOL 141
Mathematical and Scientific Reasoning 4. Demonstrate	<ul style="list-style-type: none"> • ENG 299 • CAAP • Capstone Project 	<ul style="list-style-type: none"> • GEOL 141 • MATH 107 • ENG 299

mathematical principles. 5. Demonstrate scientific reasoning. 6. Apply scientific methods to the inquiry process	<ul style="list-style-type: none"> • Laboratory Exercise • Laboratory Report • Writing Across The Curriculum Rubric • Oral Presentation Rubric • Critical Thinking Rubric 	
Critical Thinking 7. Read and analyze complex ideas. 8. Locate, evaluate and apply research information. 9. Evaluate and present well-reasoned	<ul style="list-style-type: none"> • ENG 299 • CAAP • Capstone Project • Laboratory Exercise • Writing Across The Curriculum Rubric • Oral Presentation Rubric • Critical Thinking Rubric 	<ul style="list-style-type: none"> • ACS 100 • ENG 102 • ENG 233 • ENG 299 • GEOL 141

Overview

The Wind Energy Technology assessment plan is addressed via a plan→do→study→adjust assessment cycle that begins every fall semester and follows one Wind Energy Technology cohort from first semester through graduation.