

Focus Areas:
Wind Energy,
Solar Energy,
Blade Repair,
Substation,
Unmanned Aircraft
Systems (Drones)

RENEWABLE ENERGY

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Recent graduates hired as:

- Wind Farm Technician
- Substation Technician
- Blade Repair Technician
- Wind Farm Manager
- Solar Array Technician
- Drone Pilot

DEGREES & CERTIFICATES

Solar Energy33-hour certificate	Blade Repair16-hour certificate
Solar Energy A.A.S. - 64 hours	Wind Energy Technology.....16-hour certificate
sUAS (Drones)18-hour certificate	Substation Technician.....33-hour certificate
sUAS (Drones)30-hour certificate	Wind Energy Technology.....33-hour certificate
sUAS (Drones) A.A.S. - 62 hours	Wind Energy Technology..... A.A.S - 64 hours
	Associate of General Studies..... A.G.S. - 62 hours

RENEWABLE ENERGY

Program Learning Outcomes

Wind Energy Technology:

16-hour Certificate

1. Students will explain all general safety guidelines related to the wind energy industry.
2. Students will summarize all aspects of the fundamental operation of a wind turbine and its relationship relative to a wind farm.
3. Students will summarize the extensive aspects of the wind industry; computer technology, personal communications, teamwork, and environmental issues.

33-hour Certificate

1. Students will safely operate, maintain, troubleshoot, and repair mechanical systems.
2. Students will safely operate, maintain, troubleshoot, and repair electrical systems.
3. Students will safely operate, maintain, troubleshoot, and repair hydraulic systems.
4. Students will demonstrate the extensive skill sets of the wind industry; computer technology, personal communications, and teamwork.

Associate of Applied Science

1. Students will explain and comply with all OSHA safety standards related to the wind energy industry.
2. Students will describe electrical transmission from a wind turbine, through a wind farm, and exiting a collection substation.
3. Students will troubleshoot and optimize wind farm performance through the collection and interpretation of data.

sUAS:

18-hour Certificate

1. Students will explain a sectional chart and identify different airspace.
2. Students will match different platforms and sensor payloads with their appropriate missions.
3. Students will identify and describe all of the individual components of the sUAS and explain how they integrate into its system.

30-hour Certificate:

1. Students will use a sectional chart to comply with different airspace restrictions.
2. Students will program and perform an autonomous sUAS mission.
3. Students will describe and implement a scheduled and as needed maintenance strategy for various sUAS platforms.

Associate of Applied Science

1. Students will describe and evaluate the impact of recent legislation dealing with sUAS.
2. Students will evaluate and select the appropriate platform and sensor payload for the required mission.
3. Students will analyze and compare all of the individual components of the sUAS and assess system integration.

Solar Energy:

33-hour Certificate

1. Students will identify the various safety hazards associated with PV systems and components.
2. Students will identify common types of PV system application with and without energy storage.
3. Students will describe the purpose and principles of operation for major PV system components.
4. Students will explain how PV modules are configured in series and parallel to build voltage, current, and power output.
5. Students will identify the requirements for plan review, permitting, inspections, construction contracts and other matters associated with approvals and code-compliance for PV systems.
6. Students will describe project side considerations, including common roof structural design, types of electrical services, point of interconnection, effects of obstructions, shading analysis tools and techniques, and effects of wind exposure.

Associate of Applied Science

1. Students will comply with all safety regulations associated with PV systems and components.
2. Students will analyze and compare different types of PV system application with and without energy storage.
3. Students will troubleshoot PV system components.
4. Students will configure and optimize PV modules in series and parallel to build voltage, current, and power output.
5. Students will demonstrate the required steps for plan review, permitting, inspections, construction contracts and other matters associated with approvals and code-compliance for PV systems.
6. Students will formulate and assess PV solutions to project site considerations, including common roof structural design, types of electrical services, point of interconnection, effects of obstructions, shading analysis tools and techniques, and effects of wind exposure.

RENEWABLE ENERGY

Program Learning Outcomes

Renewable Energy:

Associate of General Studies

1. Students will apply the knowledge and skills from multiple disciplines with renewable energy to be prepared for opportunities in governmental policy, entrepreneurship, or technical professions.
2. Students will identify the various safety hazards associated with PV systems and components.
3. Students will identify common types of PV system application with and without energy storage.
4. Students will describe the purpose and principles of operation for major PV system components.
5. Asset Selection: Students will evaluate and select the appropriate platform and sensor payload for the required mission.
6. Industry Trends and Literacy: Students will describe and evaluate the impact of recent legislation dealing with sUAS.
7. System Literacy: Students will analyze and compare all of the individual components of the sUAS and assess system integration.
8. Students will explain all general safety guidelines related to the wind energy industry.
9. Students will summarize all aspects of the fundamental operation of a wind turbine and its relationship relative to a wind farm.
10. Students will summarize the extensive aspects of the wind industry; computer technology, personal communications, teamwork, and environmental issues.
11. Students will safely operate, maintain, troubleshoot, and repair electrical systems.



RENEWABLE ENERGY

Solar Energy 33-Hour Certificate

General Education Required Courses 6 cr

Communication Discipline Area 3
 CM115 Public Speaking (3 cr) **or**
 CM240 Interpersonal Communications (3 cr)

Mathematics & Statistics Discipline Area 3
 MA104 Technical Math (3 cr) **or**
 MA110 Intermediate Algebra (3 cr) **or**
 Mathematics General Education Course

Required Solar Energy Courses 21 cr

SE100 Introduction to Solar Energy 3
 SE101 Solar Energy Fundamentals 3
 SE102 Solar Energy Design 3
 SE103 Solar Energy Operations & Maintenance 3
 WE105 Employability Skills, Safety, & Blueprint Reading 3
 WE110 Electrical Theory 3
 WE250 Data Acquisition & Communications 3

Elective Courses 6 cr

BE160 Business Accounting 3
 BE170 Business Statistics 3
 CS108 Computer Applications 3
 CS155 Networking and Computer Technology 3
 CS140 Introduction to Robotics 3
 MG102 Introduction to Entrepreneurship 3
 UA100 Introduction to sUAS 3
 UA110 sUAS Ground School 3
 SC109 Applied Physics 3
 WE100 Introduction to Wind Energy 3
 WE210 Motor Control Circuits 3
 WE225 Electric Motors and Generators 3
 WE230 Substation & Voltage Regulation 3
 WE270 Transformer Theory 3
 WE280 Wind Energy Technology Internship 1-4



RENEWABLE ENERGY

Solar Energy Associate of Applied Science 64 Hours

General Education Required Courses		19 cr	Required Solar Courses		36 cr
<i>English Discipline Area</i>		3	SE100	Introduction to Solar Energy	3
CM101 English Composition I (3 cr) or			SE101	Solar Energy Fundamentals	3
CM120 Survey of Technical Writing (3 cr)			SE102	Solar Energy Design	3
<i>Communication Discipline Area</i>		3	SE103	Solar Energy Operations & Maintenance	3
CM115 Public Speaking (3 cr) or			SE201	Advanced Solar Energy Design	3
CM240 Interpersonal Communication (3 cr)			SE202	Advanced Solar Energy Installation	3
<i>Arts and Humanities Discipline Area</i>		3	SE203	Solar Energy System Commissioning	3
<i>(Choose from 1 area below)</i>			SE204	Solar Energy Advanced Operations & Maintenance	3
Art	Humanities		WE105	Employability Skills, Safety, & Blueprint Reading	3
Music	Literature		WE110	Electrical Theory	3
Theatre	Philosophy		WE210	Motor Control Circuits	3
Foreign Language	History		WE250	Data Acquisition & Communications	3
<i>Mathematics and Statistics Discipline Area</i>		3	Elective Courses		9 cr
MA104 Technical Math (3 cr) or			BE160	Business Accounting	3
MA110 Intermediate Algebra (3 cr) or			BE170	Business Statistics	3
Mathematics General Education Course			CS108	Computer Applications	3
<i>Natural and Physical Science Discipline Area</i>		4	CS140	Introduction to Robotics	3
SC107 Meteorology (4 cr) or			CS155	Networking and Computer Technology	3
SC137 Natural Hazards and Disasters (3 cr) and			MG102	Introduction to Entrepreneurship	3
SC138 Natural Hazards and Disasters Lab (1 cr) or			SC109	Applied Physics	3
SC146 Environmental Science & Conservation (3 cr) and			UA100	Introduction to sUAS	3
SC147 Environmental Science & Conservation Lab (1 cr)			UA110	sUAS Ground School	3
<i>Social and Behavioral Discipline Area</i>		3	WE100	Introduction to Wind Energy	3
<i>(1 area required)</i>			WE225	Electric Motors and Generators	3
Economics	Anthropology		WE230	Substation & Voltage Regulation	3
Psychology	Political Science		WE270	Transformer Theory	3
Sociology	Geography		WE280	Wind Energy Technology Internship	1-4



RENEWABLE ENERGY

sUAS Remote Pilot(Drones)

18-Hour Certificate

General Education Required Courses 6 cr

English Discipline Area 3
CM101 English Composition I (3 cr) **or**
CM120 Survey of Technical Writing (3 cr)

Mathematics and Statistics Discipline Area 3

MA104 Technical Math (3 cr) **or**
MA110 Intermediate Algebra **or**
Mathematics General Education Course

Required sUAS Courses 9 cr

UA110 sUAS Ground School 3
UA140 sUAS Applications 3
UA150 sUAS Personnel, Safety, & Crew Resource Mgmt 3

Elective Courses 3 cr

CS140 Introduction to Robotics 3
CS145 Introduction to CAD 3



RENEWABLE ENERGY

sUAS (Drones) 30-Hour Certificate

General Education Required Courses 6 cr

<i>English Discipline Area</i>	3
CM101 English Composition I (3 cr) or CM120 Survey of Technical Writing (3 cr)	
<i>Mathematics and Statistics Discipline Area</i>	3
MA104 Technical Math or MA110 Intermediate Algebra or Mathematics General Education Course	

Required sUAS Courses 18 cr

UA110 sUAS Ground School	3
UA140 sUAS Applications	3
UA150 sUAS Personnel, Safety, & Crew Resource Mgmt	3
UA201 sUAS Command, Control, & Communications	3
UA210 sUAS Systems & Conceptual Design	3
WE240 GIS/GPS	3

Elective Courses 6 cr

AG255 Precision Ag Hardware	3
AG256 Precision Ag Software	3
AR129 Introduction to Digital Photography	3
CS140 Introduction to Robotics	3
CS141 Introduction to Additive Manufacturing (3D Printing)	3
CS145 Introduction to CAD	3
EC101 Introduction to Macroeconomics	3
MG102 Introduction to Entrepreneurship	3
UA100 Introduction to sUAS	3
WE110 Electrical Theory	3
WE250 Data Acquisition & Communications	3
WE280 Wind Energy Technology Internship	4



RENEWABLE ENERGY

sUAS (Drones)

Associate of Applied Science

62 Hours

General Education Required Courses 19 cr

English Discipline Area 3

- CM101 English Composition I (3 cr) **or**
CM120 Survey of Technical Writing (3 cr)

Communication Discipline Area 3

- CM115 Public Speaking (3 cr) **or**
CM240 Interpersonal Communication (3 cr)

Arts and Humanities Discipline Area 3

(Choose from 1 area below)

- | | |
|------------------|------------|
| Art | Humanities |
| Music | Literature |
| Theatre | Philosophy |
| Foreign Language | History |

Mathematics and Statistics Discipline Area 3

- MA104 Technical Math (3 cr) **or**
MA110 Intermediate Algebra (3 cr) **or**
Mathematics General Education Course

Natural and Physical Science Discipline Area 4

- SC107 Meteorology (4 cr) recommended

Social and Behavioral Science Discipline Area 3

- SS101 General Psychology (Suggested)

Required Courses 27 cr

UA100	Introduction to sUAS	3
UA110	sUAS Ground School	3
UA140	sUAS Applications	3
UA150	sUAS Personnel, Safety, & Crew Resource Mgmt	3
UA201	sUAS Command, Control, & Comm.	3
UA210	sUAS Systems & Conceptual Design	3
WE240	GIS/GPS	3
WE250	Data Acquisition and Communications	3
WE255	Airfoils and Composite Repair	3

Elective Courses 16 cr

AG255	Precision Ag Hardware	3
AG256	Precision Ag Software	3
AR129	Introduction to Digital Photography	3
CS140	Introduction to Robotics	3
CS141	Introduction to Additive Manufacturing (3D Printing)	3
CS145	Introduction to CAD	3
CS155	Networking & Computer Technology	3
EC101	Principles of Macroeconomics	3
MG102	Introduction to Entrepreneurship	3
SC109	Applied Physics	3
WE110	Electrical Theory	3
WE280	Wind Energy Technology Internship	4



RENEWABLE ENERGY

Blade Repair 16-Hour Certificate

General Education Required Courses 3 cr

English Discipline Area 3
CM101 English Composition I (3 cr) **or**
CM120 Survey of Technical Writing (3 cr)

Required Blade Repair Courses 13 cr

WE100 Introduction to Wind Energy 3
WE255 Airfoils and Composite Repair 3
WE257 Applied Airfoils 3
*WE262 Blade Repair Operations 4

*Must have a physical on file prior to enrolling in this class.



RENEWABLE ENERGY

Wind Energy Technology 16-Hour Certificate

General Education Required Courses 3 cr

CM101 English Composition (3 cr) or	3
CM120 Survey of Technical Writing (3 cr) or	
MA104 Technical Math (3 cr) or	
MA110 Intermediate Algebra (3 cr) or	
Mathematics General Education Course	

Required Wind Energy Courses 6 cr

WE100 Introduction to Wind Energy	3
WE110 Electrical Theory	3

Elective Courses 7 cr

CS140 Introduction to Robotics	3
CS155 Networking & Computer Technology	3
SE100 Introduction to Solar Energy	3
UA100 Introduction to sUAS	3
UA110 sUAS Ground School	3
WE105 Employability Skills, Safety, & Blueprinting Reading	3
WE120 Hydraulics	3
WE150 Mechanical Systems	3
WE210 Motor Control Circuits	3
WE225 Electric Motors and Generators	3
WE250 Data Acquisition & Communications	3
WE255 Airfoils and Composite Repair	3
*WE265 Field Training & Project Operations	3
WE280 Wind Energy Technology Internship	1-4

*Must have a physical on file prior to enrolling in this class.



RENEWABLE ENERGY

Substation Technician 33-Hour Certificate

General Education Required Courses 6 cr

English or Communication Discipline Area 3
 CM101 English Composition I (3 cr) **or**
 CM120 Survey of Technical Writing (3 cr) **or**
 CM115 Public Speaking (3 cr) **or**
 CM240 Interpersonal Communications (3 cr)

Mathematics and Statistics Discipline Area 3
 MA104 Technical Math (3 cr) **or**
 MA110 Intermediate Algebra (3 cr) **or**
 Mathematics General Education Course

Required Substation Courses 24 cr

WE105 Employability Skills, Safety, & Blueprint Reading 3
 WE110 Electrical Theory 3
 WE202 Electrical Power Delivery 3
 WE215 Electrical System Protection & Coordination 3
 WE225 Electric Motors and Generators 3
 WE230 Substation & Voltage Regulation 3
 WE250 Data Acquisition & Communications 3
 WE270 Transformer Theory 3

Elective Courses 3 cr

SE100 Introduction to Solar Energy 3
 UA110 sUAS Ground School 3
 WE100 Introduction to Wind Energy 3
 WE210 Motor Control Circuits 3



RENEWABLE ENERGY

Wind Energy Technology 33-Hour Certificate

General Education Required Courses 6 cr

<i>English Discipline Area</i>	3
CM101 English Composition I (3 cr) or CM120 Survey of Technical Writing (3 cr)	
<i>Mathematics and Statistics Discipline Area</i>	3
MA104 Technical Math (3 cr) or MA110 Intermediate Algebra (3 cr) or Mathematics General Education Course	

Required Wind Energy Courses 21 cr

WE100 Introduction to Wind Energy	3
WE110 Electrical Theory	3
WE120 Hydraulics	3
WE150 Mechanical Systems	3
WE210 Motor Control Circuits	3
WE225 Electric Motors and Generators	3
*WE265 Field Training & Project Operations	3

Elective Courses 6 cr

CS140 Introduction to Robotics	3
CS155 Networking & Computer Technology	3
SE100 Introduction to Solar Energy	3
UA100 Introduction to sUAS	3
UA110 sUAS Ground School	3
WE105 Employability Skills, Safety, & Blueprint Reading	3
WE230 Substation & Voltage Regulation	3
WE250 Data Acquisition & Communications	3
WE255 Airfoils and Composite Repair	3
WE280 Wind Energy Technology Internship	1-4

*Must have a physical on file prior to enrolling in this course.



RENEWABLE ENERGY

WIND ENERGY TECHNOLOGY (WET)

Associate of Applied Science

64 Hours

General Education Required Courses 19 cr

<i>English Discipline Area</i>		3
CM101 English Composition I (3 cr) or		
CM120 Survey of Technical Writing (3)		
<i>Communication Discipline Area</i>		3
CM115 Public Speaking (3 cr) or		
CM240 Interpersonal Communication (3 cr)		
<i>Arts and Humanities Discipline Area</i>		3
<i>(Choose from 1 area below)</i>		
Art	Humanities	
Music	Literature	
Theatre	Philosophy	
Foreign Language	History	
<i>Mathematics and Statistics Discipline area</i>		3
MA104 Technical Math (3 cr) or		
MA110 Intermediate Algebra (3 cr) or		
Mathematics General Education Course		
<i>Natural and Physical Science Discipline Area</i>		4
SC107 Meteorology (4 cr)		
<i>Social and Behavioral Science Discipline Area</i>		3
SS101 General Psychology (3 cr)		

Required Wind Courses 39 cr

SC109 Applied Physics	3
WE100 Introduction to Wind Energy	3
WE105 Employability Skills, Safety, & Blueprint Reading	3
WE110 Electrical Theory	3
WE120 Hydraulics	3
WE150 Mechanical Systems	3
WE210 Motor Control Circuits	3
WE225 Electric Motors and Generators	3
WE230 Substation & Voltage Regulation	3
WE240 GIS/GPS	3
WE250 Data Acquisition & Communications	3
WE255 Airfoils and Composite Repair	3
*WE265 Field Training & Project Operations	3

Elective Courses 6 cr

CS140 Introduction to Robotics	3
CS155 Networking & Computer Technology	3
SE100 Introduction to Solar Energy	3
UA100 Introduction to sUAS	3
UA110 sUAS Ground School	3
WE260 Wind Turbine Siting	3
WE270 Transformer Theory	3
WE280 Wind Energy Technology Internship	3-4



WET internships are available. Visit with department chair for information.

RENEWABLE ENERGY

Associate of General Studies 62 Hour

Required General Education Courses 25 cr

<i>English Discipline Area</i>	3
CM101 English Composition I (3 cr) or CM120 Survey of Technical Writing (3 cr)	
<i>Communication Discipline Area</i>	3
CM115 Public Speaking (3 cr) or CM240 Interpersonal Communications (3 cr)	
<i>Mathematics and Statistics Discipline Area</i>	3
Mathematics General Education Course or MA110 Intermediate Algebra (3 cr)	
<i>Arts and Humanities Discipline Area</i>	3
Art Humanities Music Literature Theatre Philosophy Foreign Language History	
<i>Social and Behavioral Science Discipline Area</i>	3
Economics Anthropology Psychology Political Science Sociology Geography	
<i>Humanities or Social Science Discipline Area</i> (Must be from second area)	3
<i>Natural and Physical Science Discipline Area</i>	4
<i>Open General Education Elective from above</i> <i>Discipline areas</i>	3

Required Renewable Energy Courses 12 cr

SE100 Introduction to Solar Energy	3
UA100 Introduction to sUAS	3
WE100 Introduction to Wind Energy	3
WE110 Electrical Theory	3

Elective Courses 19 cr

Business	
BE100 Introduction to Business	3
BE152 Salesmanship	3
BE154 Business Law	3
BE155 Marketing	3
BE160 Business Accounting	3
BE170 Business Statistics	3
BE185 Human Resource Management	3
BE188 Principles of Advertising	3
EC101 Principles of Macroeconomics	3
EC102 Principles of Microeconomics	3
MG101 Management Principles	3
MG102 Introduction to Entrepreneurship	3

Political Science and History	
HI122 US History I	3
HI123 US History II	3
SS130 Introduction to Sociology	3
SS140 U.S. Gov't: National	3
SS141 U.S. Gov't: State and Local	3
SS142 Current Political Issues	3

Energy Technology

IE117 OSHA 10-Hour General Industry Training	1
SE101 Solar Energy Fundamentals	3
SE102 Solar Energy Design	3
SE103 Solar Energy Operations & Maintenance	3
SE201 Advanced Solar Energy Design	3
SE202 Advanced Solar Energy Installation	3
SE203 Solar Energy System Commissioning	3
SE204 Solar Energy Advanced O&M	3
UA201 sUAS Command, Control, and Communication	3
UA210 sUAS Systems & Conceptual Design	3
WE105 Employability Skills, Safety, & Blueprint Reading	3
WE120 Hydraulics	3
WE150 Mechanical Systems	3
WE202 Electrical Power Delivery	3
WE210 Electronics	3
WE215 Electrical System Protection and Coordination	3
WE220 Cooperative Ed Internship	3
WE225 Electric Motors and Generators	3
WE227 PLC's	3
WE230 Substation & Voltage Regulation	3
WE240 GIS/GPS	3
WE250 Data Acquisition & Communication	3
WE255 Airfoils & Composite Repair	3
WE257 Applied Airfoils	3
*WE262 Blade Repair Operations	3
*WE265 Field Training & Project Operations	3
WE270 Transformer Theory	3
WE280 Wind Energy Technology Internship	1-4

Additional Electives

CS108 Computer Applications	3
CS155 Networking and Computer Technology	3
MA114 Elementary Statistics	3
SC107 Meteorology	4
SC109 Applied Physics	3

Life Skills

BE139 Basic Personal Finance	1
BE210 Leadership Development	3
PE141 Personal Wellness	3
PE250 Stress Management	3
SS106 Marriage and Family	3

Open Electives 6 cr

*Must have a physical on file prior to enrolling in this course.