

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

Employment:
\$36,000-\$67,000

RENEWABLE ENERGY

Department Chair: Kit Thompson
kthompson@cloud.edu • 243.1435, ext. 256



Recent graduates hired as:

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

Renewable Energy is an essential component of a sustainable future. Certificates in wind, solar, substation, or unmanned aircraft vehicles can be completed in a year and form a foundation for two-year “go to work” technician programs. Stacking additional certificates to a two-year program allows students to broaden their training and experience which expands employment opportunities. The college energy park and working substation lab provide hands-on training opportunities for students. Students interested in pursuing a Bachelor’s degree should consider the A.S. program.

DEGREES & CERTIFICATES

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

Fields of Study

RENEWABLE ENERGY

Blade-Repair 16-Hour Certificate

General Education Required Courses 3 cr

<i>Communication Requirement</i>	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 admittance to Wind Program to enroll in this course or permission from Department Chair.



Fields of Study

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 Writin (3 cr) or	
MA110 Intermediate Algebra (3 cr) or	
Mathematics General Education Course	

Required Wind Energy Courses 3 cr

WE100 Introduction to Wind Energy	3
-----------------------------------	---

Elective Courses 10 cr

CS155 Networking & Computer Technology	3
SE100 Introduction to Solar Energy	3
UA100 Introduction to sUAS	3
WE110 Electrical Theory	3
WE120 Hydraulics	3
WE150 Mechanical Systems	3
*WE210 Electronics	3
*WE225 Motors, Generators, PLC's	3
*WE250 Data Acquisition & Communication	3
WE255 Airfoils and Composite Repair	3
*WE265 Field Training & Project Operations	3
WE280 Wind Energy Technology Internship	1-4

*Must have admittance to Wind Program to enroll in these courses or permission from Department Chair.



Fields of Study

RENEWABLE ENERGY

Solar Energy 33-Hour Certificate

General Education Required Courses 6 cr

<i>Communication Requirement</i>	3
CM115 Public Speaking (3 cr) or	
CM240 Interpersonal Communications (3 cr)	
<i>Mathematics Requirement</i>	3
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
MG102	Small Business Management	3
SC109	Applied Physics	3
WE100	Introduction to Wind Energy	3
*WE210	Electronics	3
*WE225	Motors, Generators, PLC's	3
*WE230	Substation & Voltage Regulations	3
*WE270	Transformer Theory	3
WE280	Wind Energy Technology Internship	1-4

*Must have admittance to Wind Program to enroll in these courses or permission from Department Chair.



Fields of Study

RENEWABLE ENERGY

Substation Technician

33-Hour Certificate

General Education Required Courses	6 cr	Required Substation Courses	27 cr
<i>Communication Requirement</i>	3	WE105 Employability Skills, Safety, & Blueprint Reading	3
CM101 English Composition I (3 cr) or		WE110 Electrical Theory	3
CM120 Survey of Technical Writing (3 cr) or		WE202 Electrical Power Delivery	3
CM115 Public Speaking (3 cr) or		*WE210 Electronics	3
CM240 Interpersonal Communications (3 cr)		*WE215 Electrical System Protection & Coordination	3
<i>Mathematics Requirement</i>	3	*WE225 Motors, Generators, PLC's	3
MA110 Intermediate Algebra (3 cr) or		*WE230 Substation & Voltage Regulations	3
Mathematics General Education Course		*WE250 Data Acquisition & Communication	3
		*WE270 Transformer Theory	3

*Must have admittance to Wind Program to enroll in these courses or permission from Department Chair.



Fields of Study

RENEWABLE ENERGY

sUAS (Drones) 30-Hour Certificate

General Education Required Courses 6 cr

<i>Communication Requirement</i>	3
CM101 English Composition I (3 cr) or CM120 Survey of Technical Writing (3 cr)	
<i>Mathematics Requirement</i>	3
MA110 Intermediate Algebra or Mathematics General Education Course	

Required sUAS Courses 15 cr

UA100 Introduction to sUAS	3
UA201 sUAS Command, Control, & Comm.	3
UA210 sUAS Systems & Conceptual Design	3
WE110 Electrical Theory	3
WE240 GIS/GPS	3

Elective Courses 9 cr

AG132 Agriculture Management	3
AG255 Precision Ag Hardware	3
AG256 Precision Ag Software	3
AG257 Precision Ag Machine Data Management	3
AG210 Agriculture Advertising & Design	3
AG217 Farm Computer Applications	3
AG220 Cooperative Ed Internships	1-4
AR129 Introduction to Digital Photography	3
AR210 Digital Video Techniques	3
MG102 Small Business Management	3
WE105 Employability Skills, Safety, & Blueprint Reading	3
*WE250 Data Acquisition & Communications	3
WE280 Wind Energy Technology Internship	4

*Must have admittance to Wind Program to enroll in these courses or permission from Department Chair.



Fields of Study

RENEWABLE ENERGY

Wind Energy Technology 33-Hour Certificate

General Education Required Courses 6 cr

<i>Communication Requirement</i>	3
CM101 English Composition I (3 cr) or CM120 Survey of Technical Writing (3 cr)	
<i>Mathematics Requirement</i>	3
MA110 Intermediate Algebra (3 cr) or Mathematics General Education Course	

Required Wind Energy Courses 27 cr

CS155 Networking & Computer Technology	3
WE100 Introduction to Wind Energy	3
WE110 Electrical Theory	3
WE120 Hydraulics	3
WE150 Mechanical Systems	3
*WE210 Electronics	3
*WE225 Motors, Generators, PLC's	3
*WE230 Substation & Voltage Regulations or WE280 Wind Energy Technology Internship	3
*WE265 Field Training & Project Operations	3

*Must have admittance to Wind Program to enroll in these courses or permission from Department Chair.



Fields of Study

RENEWABLE ENERGY

Solar Energy

Associate of Applied Science

64 Hours

General Education Required Courses		19 cr	Required Solar Courses		36 cr
<i>Communication Requirement</i>		6	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
CM115 Public Speaking (3 cr) or			SE103	Solar Energy Operations & Maintenance	3
CM240 Interpersonal Communication (3 cr)			SE201	Advanced Solar Energy Design	3
<i>Humanities Requirement (1 area required)</i>		3	SE202	Advanced Solar Energy Installation	3
Art	Humanities		SE203	Solar Energy System Commissioning	3
Music	Literature		SE204	Solar Energy Advanced Operations & Maintenance	3
Theatre	Philosophy		WE105	Employability Skills, Safety, & Blueprint Reading	3
Foreign Language	History		WE110	Electrical Theory	3
<i>Mathematics Requirement</i>		3	*WE210	Electronics	3
MA110 Intermediate Algebra (3 cr) or			*WE250	Data Acquisition & Communications	3
Mathematics General Education Course			Elective Courses		9 cr
<i>Natural Science Requirement</i>		4	BE160	Business Accounting	3
SC107 Meteorology (4 cr) or			BE170	Business Statistics	3
SC137 Natural Hazards and Disasters (3 cr) and			CS108	Computer Applications	3
SC138 Natural Hazards and Disasters (1 cr) or			CS155	Networking and Computer Technology	3
SC146 Environmental Science & Conservation (3 cr) and			MG102	Small Business Management	3
SC147 Environmental Science & Conservation Lab (1 cr)			SC109	Applied Physics	3
<i>Social/Behavioral Science Requirement</i>		3	WE100	Introduction to Wind Energy	3
(1 area required)			*WE225	Motors, Generators, PLC's	3
Economics	Anthropology		*WE230	Substation & Voltage Regulations	3
Psychology	Political Science		*WE270	Transformer Theory	3
Sociology	Geography		WE280	Wind Energy Technology Internship	4

*Must have admittance to Wind Program to enroll in these courses or permission from Department Chair.



Fields of Study

RENEWABLE ENERGY

sUAS (Drones)

Associate of Applied Science

62 Hours

General Education Required Courses		19cr	Required Courses		21 cr
<i>Communication Requirement</i>		6	UA100	Introduction to sUAS	3
CM101 English Composition I (3 cr) or			UA201	sUAS Command, Control, & Comm.	3
CM120 Survey of Technical Writing (3 cr)			UA210	sUAS Systems & Conceptual Design	3
CM115 Public Speaking (3 cr) or			WE110	Electrical Theory	3
CM240 Interpersonal Communication (3 cr)			WE240	GIS/GPS	3
<i>Humanities Requirement (1 area required)</i>		3	*WE250	Data Acquisition and Communications	3
Art	Humanities		WE255	Airfoils and Composite Repair	3
Music	Literature		Elective Courses		
Theatre	Philosophy		AG132	Agriculture Management	3
Foreign Language	History		AG255	Precision Ag Hardware	3
<i>Mathematics Requirement</i>		3	AG256	Precision Ag Software	3
MA110 Intermediate Algebra (3cr) or			AG257	Precision Ag Machine Data Management	3
Mathematics General Education Course			AG210	Agriculture Advertising & Design	3
<i>Natural Science Requirement</i>		4	AG217	Farm Computer Applications	3
Science Gen Ed Course			AG220	Cooperative Ed Internships	1-4
SC107 Meteorology (4 cr) recommended			AR129	Introduction to Digital Photography	3
<i>Social/Behavioral Science Requirement</i>		3	AR210	Digital Video Techniques	3
<i>(1 area required)</i>			MG102	Small Business Management	3
Economics	Anthropology		WE105	Employability Skills, Safety, & Blueprint Reading	3
Psychology	Political Science		WE280	Wind Energy Technology Internship	4
Sociology	Geography				

*Must have admittance to Wind Program to enroll in these courses or permission from Department Chair.



Fields of Study

RENEWABLE ENERGY

WIND ENERGY TECHNOLOGY (WET)

Associate of Applied Science

64 Hours

General Education Required Courses 19 cr

<i>Communication Requirement</i>	6
CM101 English Composition I (3 cr) or CM120 Survey of Technical Writing (3)	
CM115 Public Speaking (3 cr) or CM240 Interpersonal Communication (3 cr)	
<i>Humanities Requirement (1 area required)</i>	3
Art Humanities	
Music Literature	
Theatre Philosophy	
Foreign Language History	
<i>Mathematics Requirement</i>	3
MA110 Intermediate Algebra (3 cr) or Mathematics General Education Course	
<i>Natural Science Requirement</i>	4
SC107 Meteorology (4 cr)	
<i>Social/Behavioral Science Requirement</i>	3
SS101 General Psychology (3 cr)	

Required Wind Courses 45 cr

CS155 Networking & Computer Technology	3
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 Electronics	3
*WE225 Motors, Generators, PLC's	3
*WE230 Substation & Voltage Regulations or WE280 Wind Energy Technology Internship	3-4
*WE250 Data Acquisition & Communication	3
WE255 Airfoils and Composite Repair	3
WE260 Wind Turbine Siting or WE240 GIS/GPS	3
*WE265 Field Training & Project Operations	3
*WE270 Transformer Theory	3

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

*Must have admittance to Wind Program to enroll in these courses or permission from Department Chair.



Fields of Study

RENEWABLE ENERGY

Associate of General Studies
62 Hour

Required General Education Courses 25 cr

Communication Requirement 6

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

Mathematics Requirement 3

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

Humanities Requirement 3

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

Social/Behavioral Science Requirement 3

- | | |
|------------|-------------------|
| Economics | Anthropology |
| Psychology | Political Science |
| Sociology | Geography |

Humanities or Social Science Requirement
 (Must be from second area) 3

Natural Science Requirement 4

- Physical Science w/lab **or**
 Biological Science w/lab

Open General Education Elective 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 | Introductin 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 | Prinicples of Macroeconomics | 3 |
| EC102 | Principles of Microeconomics | 3 |
| MG101 | Management Principles | 3 |
| MG102 | Small Business Management | 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 | .5 |
| 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 | UAS Systems & Conceptual Design | 3 |
| WE102 | Energy Industry Fundamentals | 3 |
| WE105 | Employability Skills, Safety, & Blueprint Reading | 3 |
| WE120 | Hydraulics | 3 |
| WE130 | Wind Public/Landowner Relations | 3 |
| WE150 | Mechanical Systems | 3 |
| WE202 | Electrical Power Delivery | 3 |
| WE205 | Wind Business | 3 |
| *WE210 | Electronics | 3 |
| *WE215 | Electrical System Protection and Coordination | 3 |
| *WE220 | Cooperative Education Internship | 3 |
| *WE225 | Motors, Generators, PLC's | 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 |
| WE260 | Wind Turbine Siting | 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 |
| SC146 | Environmental Science and Conservation | 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 admittance to Wind Program to enroll in these courses or permission from Department Chair.

Fields of Study

RENEWABLE ENERGY

Associate of Science

62 Hours

Required General Education Courses 32 cr

<i>Communication Requirement</i>	9
CM101 English Composition I (3 cr)	
CM102 English Composition II (3 cr)	
CM115 Public Speaking (3 cr) or	
CM240 Interpersonal Communications (3 cr)	
<i>Humanities Requirement (2 areas required)</i>	6
Art Humanities	
Music Literature	
Theatre Philosophy	
Foreign Language History	
<i>Mathematics Requirement</i>	3
Mathematics General Education Course	
<i>Natural Science Requirement</i>	8
SC146 Environmental Science & Conservation (3 cr) and	
SC147 Environmental Science & Conservation Lab (1 cr)	
SC107 Meteorology (4 cr)	
<i>Social/Behavioral Science Requirement (2 areas required)</i>	6
Economics Anthropology	
Psychology Political Science	
Sociology Geography	

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 12 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	
BE210 Leadership Development	3	
EC101 Principles of Macroeconomics	3	
EC102 Principles of Microeconomics	3	
MG101 Management Principles	3	
MG102 Small Business Management	3	
Political Science and History		
HI122 US History I	3	
HI123 US History II	3	
SS130 Introduction to Sociology	3	
SS140 U.S. Government: National	3	
SS141 U.S. Government: State and Local	3	
SS142 Current Political Issues	3	

Energy Technology

*WE210 Electronics	3
WE255 Airfoils & Composite Repair	3
WE240 GIS/GPS	3

Additional Electives

CS108 Computer Applications	3
CS155 Networking & Computer Technology	3
MA114 Elementary Statistics	3
SC109 Applied Physics	3

Open Electives 6 cr

*Must have admittance to Wind Program to enroll in these courses or permission from Department Chair.

