



Program Name: Columbia Gorge Community College Electro-Mechanical Technology Program

Lead Faculty: Jim Pytel

School: Columbia Gorge Community College

Course Name: Power Generation and Transmission

Delivery Mode(s) for Power Generation and Transmission Course (i.e. face-to-face, online, hybrid, etc): Face-to-face, online component and lab

Course Duration : Semester

of Credits for the Power Generation and Transmission Course: 5 Credits

Program Name: Electro-Mechanical Technology (formerly Renewable Energy Technology)

When did the program start?

The Renewable Energy Technology program evolved from an existing Electronics Engineering Technology program in 2007. In 2017, the program was rebranded as the Electro-Mechanical Technology program to highlight the diverse number of manufacturers that employ graduates.

What geographic area(s) do your students come from?

Nationally however primarily Pacific Northwest.

Number of Students in Program:

maximum enrollment 32 each cohort. Typical enrollment 24-30.

Demographics: Percentage Distribution

Gender

Male: typically 90%

Female: typically 10%

Ethnicity:

Caucasian – typically 80%

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African American – typically 5%

Hispanic – typically 15%

Other – N/A

What percentage if known - Veterans: typically 5%

Degree(s)/ Diplomas(s) / Certificate(s) Offered:

Certificate – 9 months, 3 quarters

AAS – 2 years, 6 quarters

How many Faculty teach energy courses at your college (note if FT or PT)?

3 Full Time faculty.

Description of Your Facilities (be sure to note any special lab facilities used for hands-on training):

2 smart classrooms with 120V/208V 3 phase AC outlets at front of class for demonstration purposes.

2 bench labs each station equipped with power supply, function generator, digital multimeter, oscilloscope, and computer. Drop 120V/208V 3 phase AC to each connection.

Special purpose equipment lab: electronics, motor control, PLCs, wind turbine nacelle trainer, wind turbine pitch trainer (electrical and hydraulic), pneumatics, protective relays

Mechanics and hydraulics lab: gear boxes, tools, shaft alignment trainers, and rigging,

Have you conducted a job market assessment? If yes, what were the findings?

Yes. Regionally and nationally wind turbine technicians remain in high demand. Additionally, graduates routinely find employment in hydropower, power transmission, advanced manufacturing, avionics, and food and beverage processing.

What do you think makes your program successful?

The Electro-Mechanical Technology program is rooted in rigorous and thorough electronics and motor control. These skills remain in continual demand regardless of industry. Additionally, content for the first year electronics, hydraulics, and motor control courses has been placed online and the courses are taught using the flipped classroom approach in a hybrid format. Students watch lectures at the time and

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place of their own choosing and class time is spent in a hardware lab working with actual equipment. The online format additionally allows a student to review content and cuts down on text book expense.

What are your industry ties? (If you have an industry advisory board, please describe its size and composition).

The Renewable Energy Technology program was created with the assistance of GE, Vestas, Siemens, Avangrid, and EDF. Since rebranding the program as Electro-Mechanical Technology the STEM committee has grown to include representatives of Bonneville Power Administration, US Army Corps of Engineers, Cardinal Glass, Turtle Island Foods, HP, Insitu, HoodTech, CloudCap, and SDS Lumber.

Do you offer internships? What is your placement rate?

Students are not required to obtain an internship, however, a large number do accept summer internships with Field Core, GE, HP, SDS Lumber, Powder Pure, and Zepher.

Is there any additional information about your program and or school you would like to include (any recent awards, publications, grant awards that pertain to your program etc.)?

Columbia Gorge Community College's (CGCC) Renewable Energy Technology program was one of the first three schools to receive the American Wind Energy Association's (AWEA) seal of approval in 2011.

CGCC's Electro-Mechanical Technology program was awarded a grant from the National Science Foundation Advanced Technological Education (NSF ATE) to develop online resources for the first year electronics, hydraulics, and motor control courses. Links to free online content:

Basic Electronics: DC Circuit Analysis

<https://www.youtube.com/watch?v=Do7VzDuB Rc&list=PLdnqjKaksr8qQ9w3XY5zFXQ2H-zXQFMII>

Basic Electronics: Single Phase AC Circuit Analysis

<https://www.youtube.com/watch?v=fIRocvQxQw4&list=PLdnqjKaksr8pXF2SpDyyD7ouAVIz96 Ra>

Basic Electronics: 3 Phase AC Circuit Analysis

<https://www.youtube.com/watch?v=RToXdTYQteo&list=PLdnqjKaksr8qzoIGCYx2rhVK51ZPjXkRO>

Hydraulics

https://www.youtube.com/watch?v=S_4anj7GpRo&list=PLdnqjKaksr8ruhw85YYSO6EWLhVVMsK

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Motor Control

<https://www.youtube.com/watch?v=LM8U9FCMDx0&list=PLdnqjKaksr8qRPCFkU2Q8XQe0bfo99rs6>

Program Link:

<https://www.cgcc.edu/career-tech-ed/em-tech>

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