



Program Name:

Lead Faculty: Michael Gengler, mgengler@iowalakes.edu, 712-362-7950



School: Iowa Lakes Community College

Delivery Mode(s) for Introduction to Wind Course (i.e. face-to-face, online, hybrid, etc): Face-to-face

Course Duration (semester, trimester, quarter, short-course, etc): 2-year AAS ; 1-year Diploma

Number of Credits for the *Wind Energy & Turbine Technology* Course: AAS = 75; Diploma = 42

Program Name: Wind Energy and Turbine Technology

When did the program start? Our first class was in 2004, the nation's first AAS in Wind Energy & Turbine Technology.

What geographic area(s) do your students come from? Our students come from all over the US, and international students have come from Africa, Turkey, Jordan, Thailand, and Central America.

Number of Students in Program: Class size is typically 60 students

Demographics: Percentage Distribution

Gender

Male: C. 94%

Female: C. 6%

Ethnicity:

Caucasian – 91.2%

This material is based upon work supported by the National Science Foundation under Grant No. 1600934.

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



African American – 1.8%

Race Not Reported 7%

What percentage if known - Veterans: 7%

Average Age - 24

Degree(s)/ Diplomas(s) / Certificate(s) Offered: Associate in Applied Science in Wind Energy & Turbine Technology; Diploma, Wind Energy & Turbine Technology

Industry certifications:

Work at Height & Rescue for the Wind Industry; Snap-on Tools at Height; AHF CPR/AED; First Aid; Blood-borne Pathogens; Snap-on Power Tool Safety, Snap-on Hand Tool Safety, HYTORC Certification, Snap-on Multi-meter Certification, OSHA-10.

How many Faculty teach energy courses at your college (note if FT or PT)? Six full-time faculty comprise our energy instructors, linking intuitive concepts across disciplines (Water Quality, Environmental Studies, Electrical Technology, HVAC, Engineering Technology and Wind Energy).

Description of Your Facilities (be sure to note any special lab facilities used for hands-on training): We operate in two facilities comprising 50,000 square feet of classroom and lab space. We fly a Vestas V-82, 1.65 MW turbine that is used for training as well as power generation to offset utility costs. We have a 3 MW Vestas V-90 on a short tower, a 2 MW Gamesa G-87 on platform, a Vestas V-82 Hub trainer, various gearboxes for borescope and mechanical familiarization. Our automation lab provides for programmable logic, networking, data acquisition, fluid power and robotics. Our climb training room for Work at Height and Rescue in the Wind Industry (U.S.) also provides for Global Wind Organization (International) certifications. Foundational skills in electrical theory and industrial processes are taught in our laboratories for motors, generators, hydraulics, mechanical systems, power transmission, electronics and digital techniques, field training and project operations.

Have you conducted a job market assessment? If yes, what were the findings? Market assessment shows wind energy technician as the 2nd leading occupational growth for the next 10 years. Truthfully, with around 114,000 jobs supporting wind energy currently, and with projected requirements for 230,000 by 2030 and 500,000 by 2050, demand for properly trained technicians far exceeds supply.

What do you think makes your program successful? Our success comes from our faculty's ability to connect dots from the natural environment to the built environment, with a focus on energy,

This material is based upon work supported by the National Science Foundation under Grant No. 1600934.

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



sustainability and the environment. Our systems approach to teaching and mentoring results in graduates that possess a thorough understanding of top human challenges and their impact on our environmental and energy future. Our variety of hands-on trainers provides the realism students deserve and prepares them to go farther, faster. We focus on professional development, putting our students and employers in regular contact, developing networking skills and giving them practice in presenting themselves to industry experts.

What are your industry ties? (If you have an industry advisory board, please describe its size and composition). Our industry advisory committees ensure that we provide relevant curriculum. One of our hallmarks is that our curriculum evolves continuously, keeping pace with what our advisory members demand. We are proud to work with companies like: Vestas Americas, Impact Access, Snap-on Industrial, Southern Power, Avangrid, Field Corps, Global Wind Services, MidAmerican Energy, NextEra Energy, FGS, E-On, Safety Technologies, LLC, Duke Energy, Siemens-Gamesa, Field Corps, Mortensen, Wanzek, Blattner Energy, Windtest North America, EDP Renewables, EDF Renewables, One-Way Building Solutions, the American Wind Energy Association, Iowa Wind Energy Association, Trusted Energy, Anemometry Specialists, World Wind and Solar, Edutech, Hy-torc, Bachman, Enerpac, Integrated Power Services, Power Climber, Alliant Energy – the list goes on.

Do you offer internships? What is your placement rate? Our students have an internship requirement where they apply their skills across the spectrum of wind energy, from construction to overhaul, and many earn traveling technician internships. Internships are competitive, pay well, and provide students a first-hand look at the wind industry. Whether an internship or full-time employment after graduation, placement takes care of itself.

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.)? Our program has been featured in media by Duracell, National Geographic (*Paris to Pittsburgh*), CNNs Great Big Story, National Public Radio, Wind Systems Magazine, Wind Power Engineering and Development, and others. We have produced dropped object prevention training (*Tools at Height*) for Snap-on and NC3, safety webinars for AWEA, and appear regularly in regional news media.

Program Link: <https://www.iowalakes.edu/academic-programs/programs-of-study/industrial-technology/wind-energy-turbine-technology/>

This material is based upon work supported by the National Science Foundation under Grant No. 1600934.

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



Wind Energy Program:

Term 1:

Electricity I
Technical Math
Career Seminar
Introduction to Wind Energy
Field Training & Project Operations
Technical Communications

Term 2:

Hydraulics
Electricity II
Field Training
Motor Controls
Energy, Sustainability & the Environment

Term 3:

Wind Energy & Turbine Technology Internship

Term 4:

Digital Circuits & Systems
Power Generation & Transmission
Electrical Maintenance and Safety
Intro to Industrial Instrumentation
Electric Motors and Generators

Term 5:

This material is based upon work supported by the National Science Foundation under Grant No. 1600934.

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



Programmable Logic Control Systems

Principles of Management

Wind Turbine Siting

Industrial Networking and Data Acquisition

Human Relations

This material is based upon work supported by the National Science Foundation under Grant No. 1600934.

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.