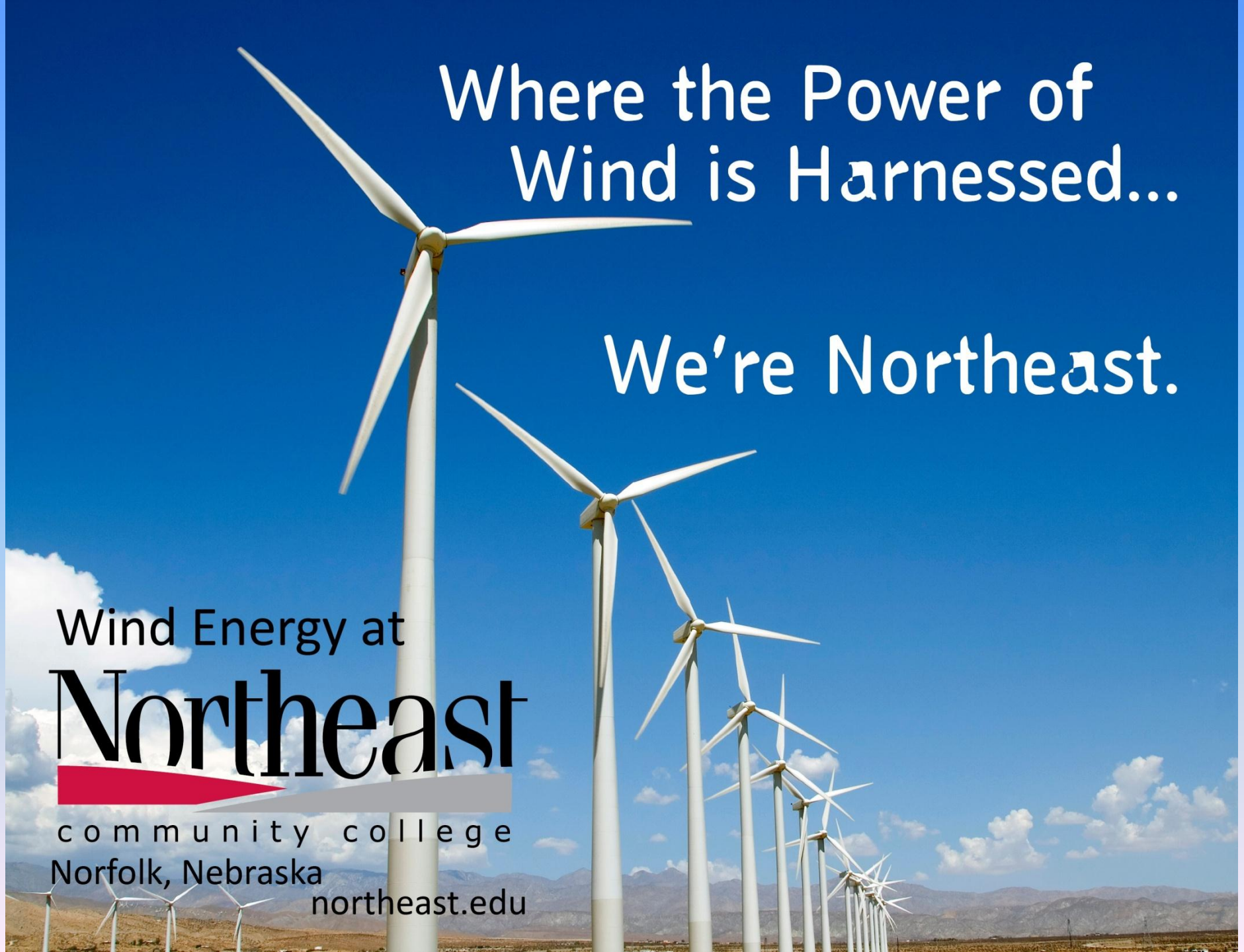
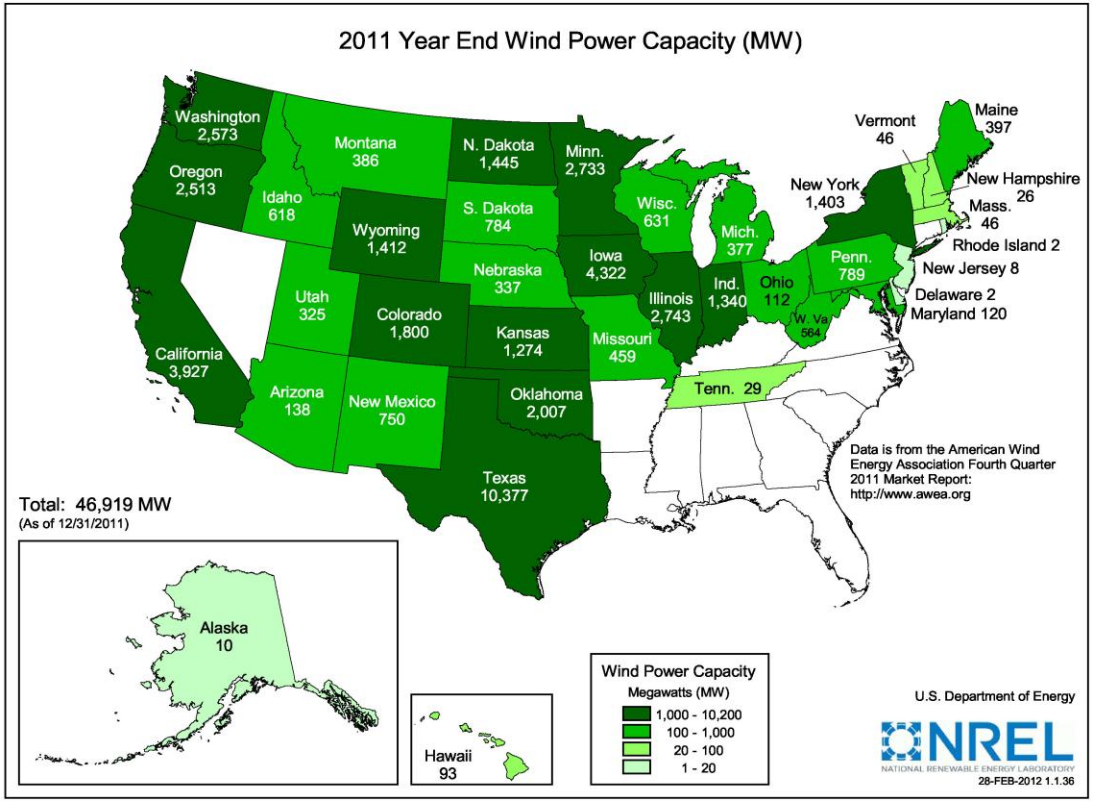
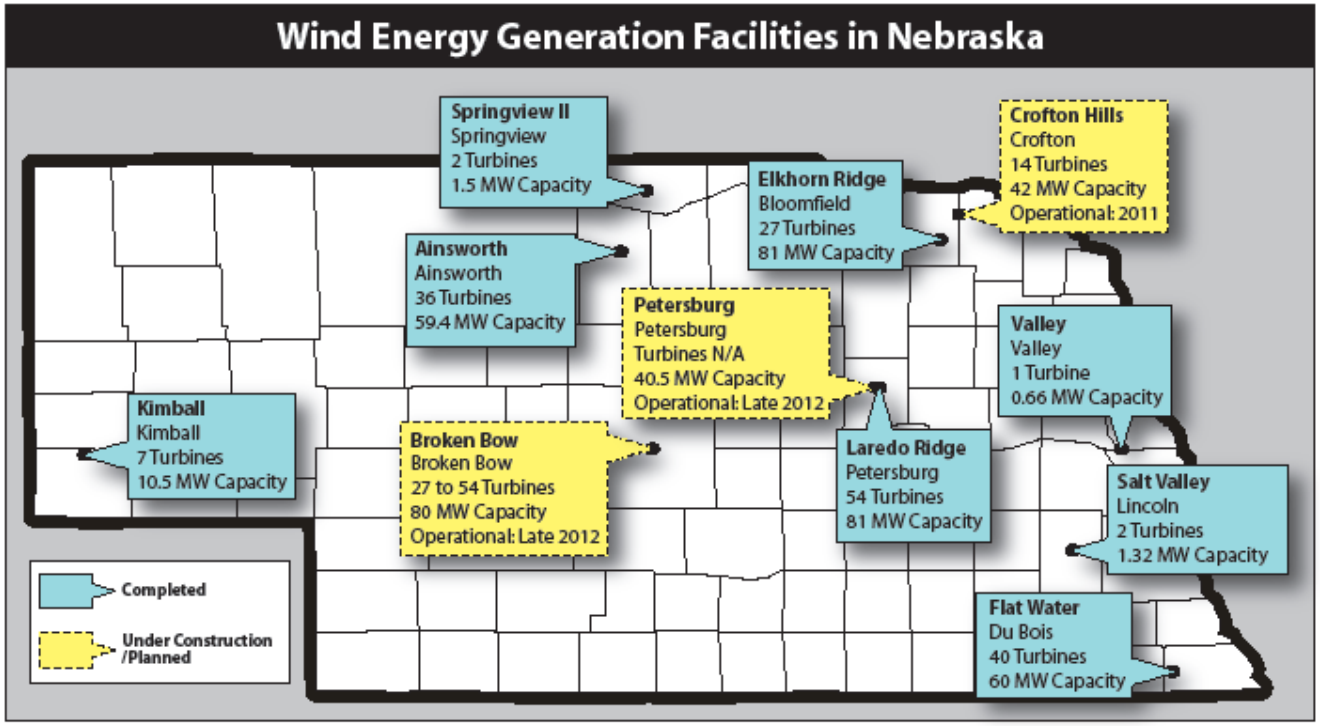

Where the Power of
Wind is Harnessed...
We're Northeast.
Wind Energy at
Northeast
community college
Norfolk, Nebraska
northeast.edu

U.S. Installed Wind Energy Capacity

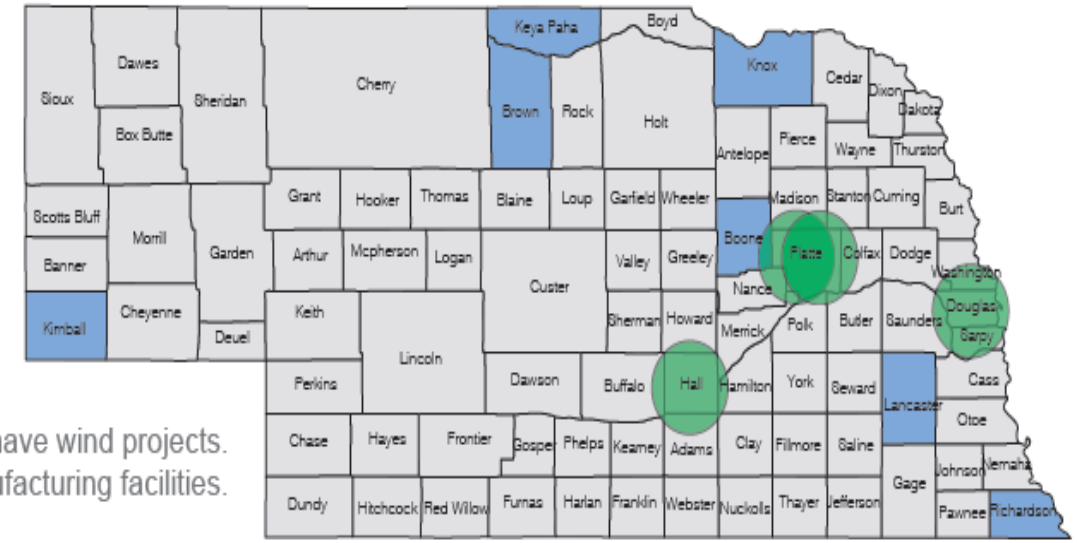



Wind Energy Generation Facilities in Nebraska
Springview II
Springview
2 Turbines
1.5 MW Capacity
Elkhorn Ridge
Bloomfield
27 Turbines
81 MW Capacity
Crofton Hills
Crofton
14 Turbines
42 MW Capacity
Operational: 2011
Ainsworth
Ainsworth
36 Turbines
59.4 MW Capacity
Petersburg
Petersburg
Turbines N/A
40.5 MW Capacity
Operational: Late 2012
Valley
Valley
1 Turbine
0.66 MW Capacity
Kimball
Kimball
7 Turbines
10.5 MW Capacity
Broken Bow
Broken Bow
27 to 54 Turbines
80 MW Capacity
Operational: Late 2012
Laredo Ridge
Petersburg
54 Turbines
81 MW Capacity
Salt Valley
Lincoln
2 Turbines
1.32 MW Capacity
Completed
Under Construction /Planned
Flat Water
Du Bois
40 Turbines
60 MW Capacity

WIND ENERGY FACTS: NEBRASKA

Developing Nebraska's incredible wind resources will create economic development in the state

Developing Nebraska's wind energy resource will create numerous jobs in Nebraska and provide many economic benefits to rural areas.



Blue counties have wind projects.
Green dots are online wind energy manufacturing facilities.

First Wind Energy Training Efforts 2005

- 10 kW American Energy Wind Tower

Resembles A Full Scale Turbine

- Bolt torques
- Yaw motor
- Control systems

South West 3.0 kW

New SW 3.0 kW

Control System

- Light facility
- Four hour battery reserve

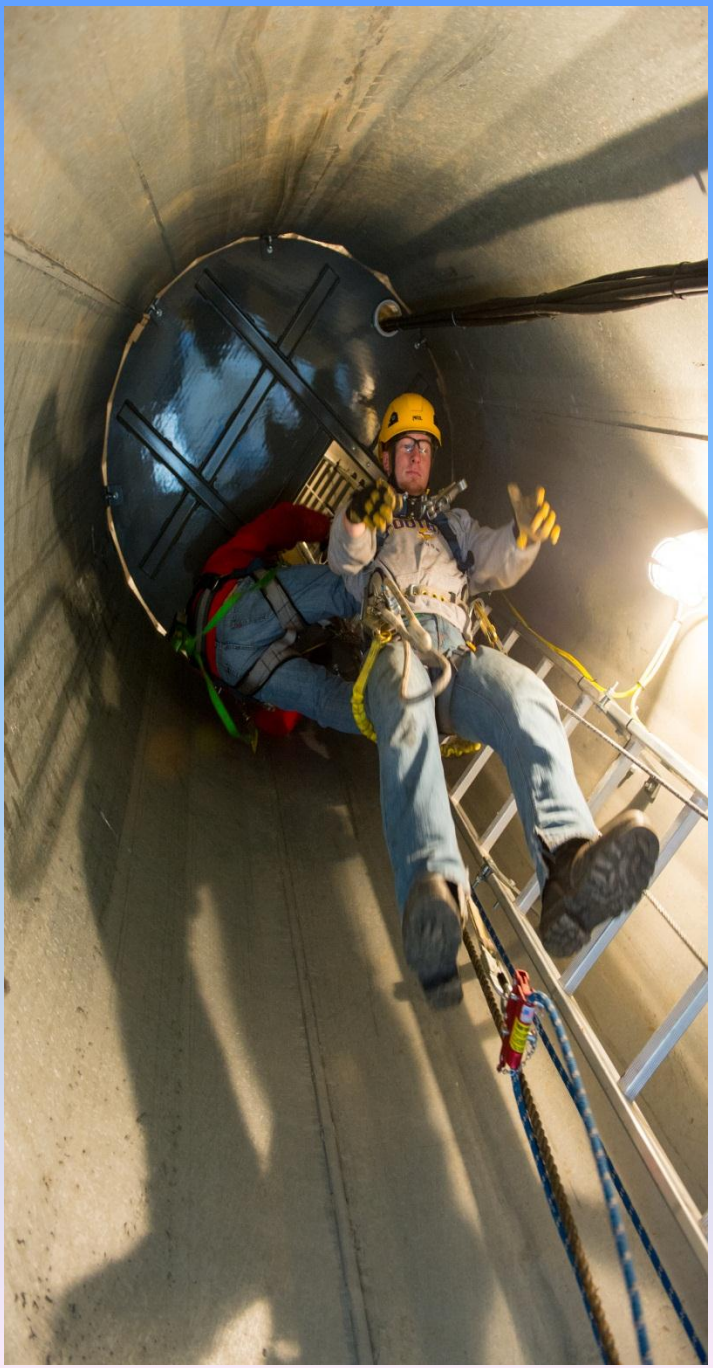
Wind Powered Lighting

- T-5 Fluorescent lighting fixtures

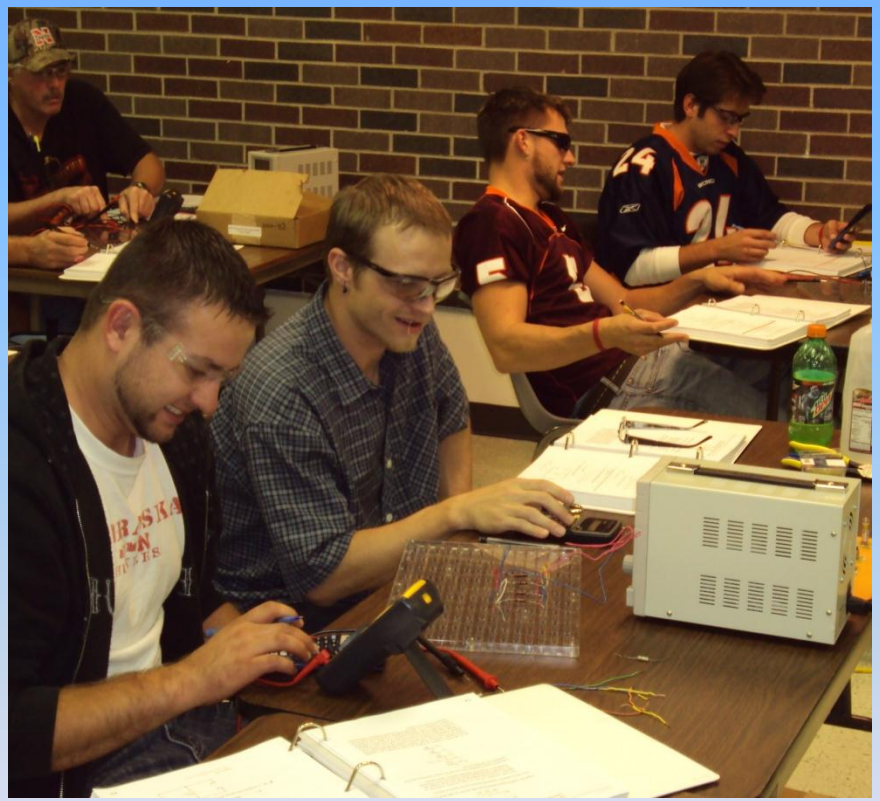
Scada Micon 108

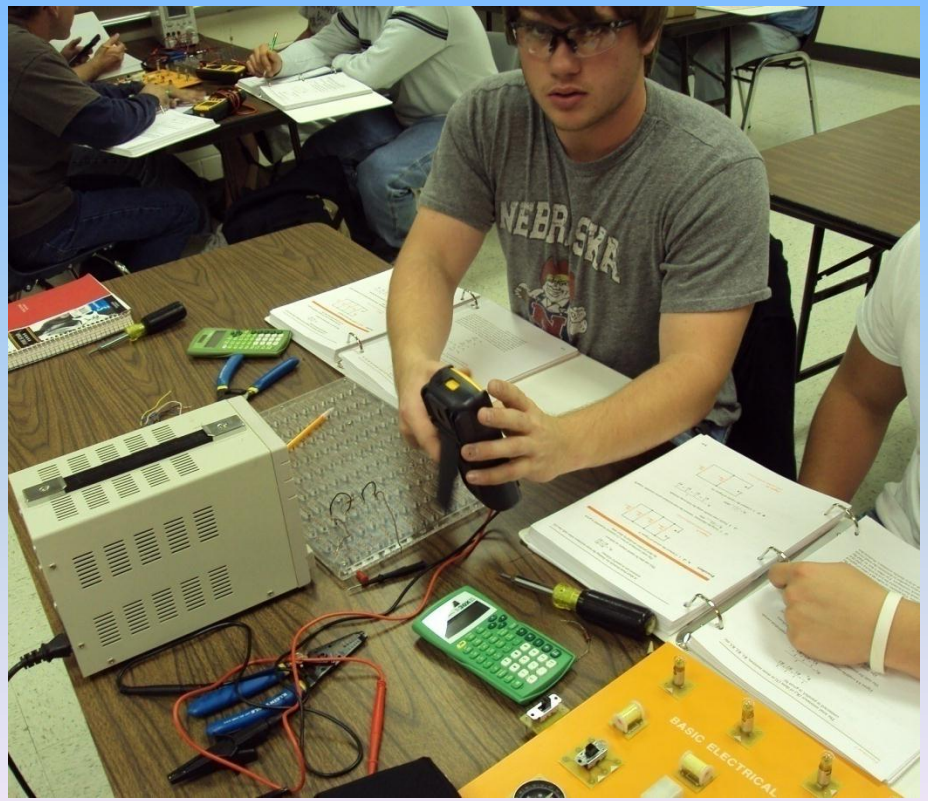
First Semester:

- Fundamentals of Electricity
- Wind Energy Fundamentals
- Wind Turbine Systems
- Blue Print Reading
- Math
- Climbing & Rescue



Fundamentals of Electricity



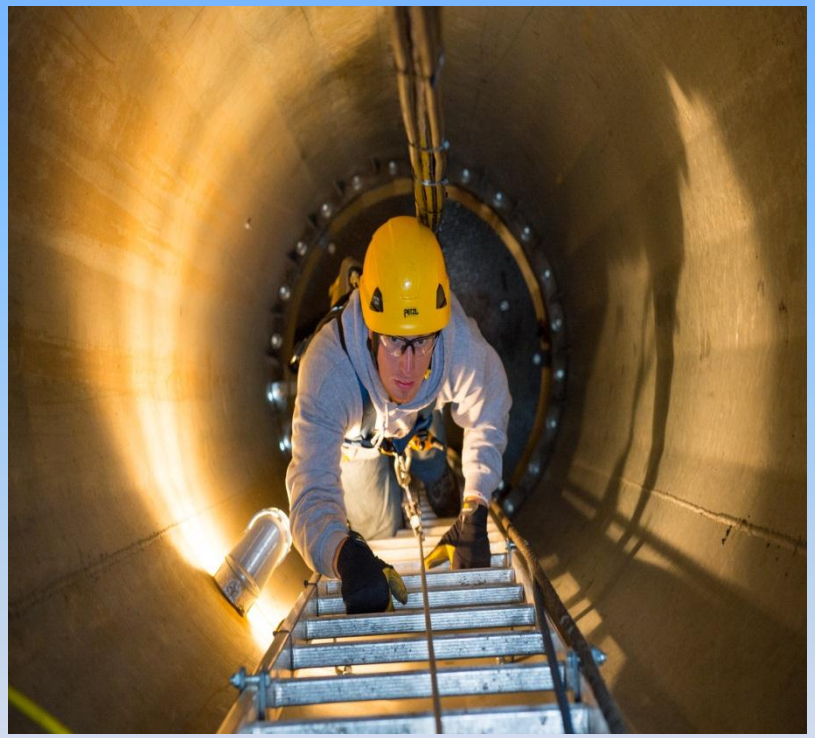


Proper Torque Procedures

GE Turbine Blade

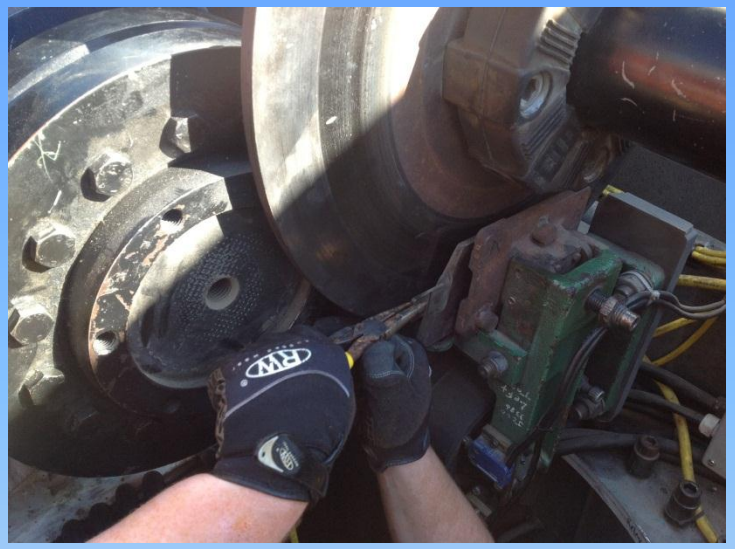
- Confined space
- Rescue procedures
- Blade defect
- Inspection
- Fiberglass repair

Climbing Exercises

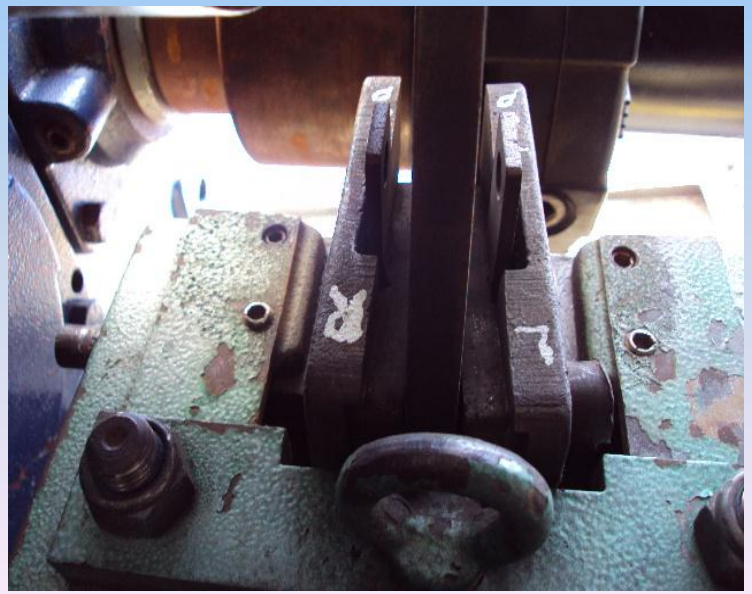


- Rappelling
- Harness safety
- Rigging

Brake Pad Replacement & Wear Analysis



Actual Hands on Experience



Second Semester:

- Mechanical and Fluid Fundamentals
- Electrical and Operations Safety/CPR
- Motor Controls
- Continued Tower Climb/Repair Lab
- Commercial Tower Climb/Climbing Certificate

Hydraulic Systems

Motor Control Systems

Second Year Program

First Semester:

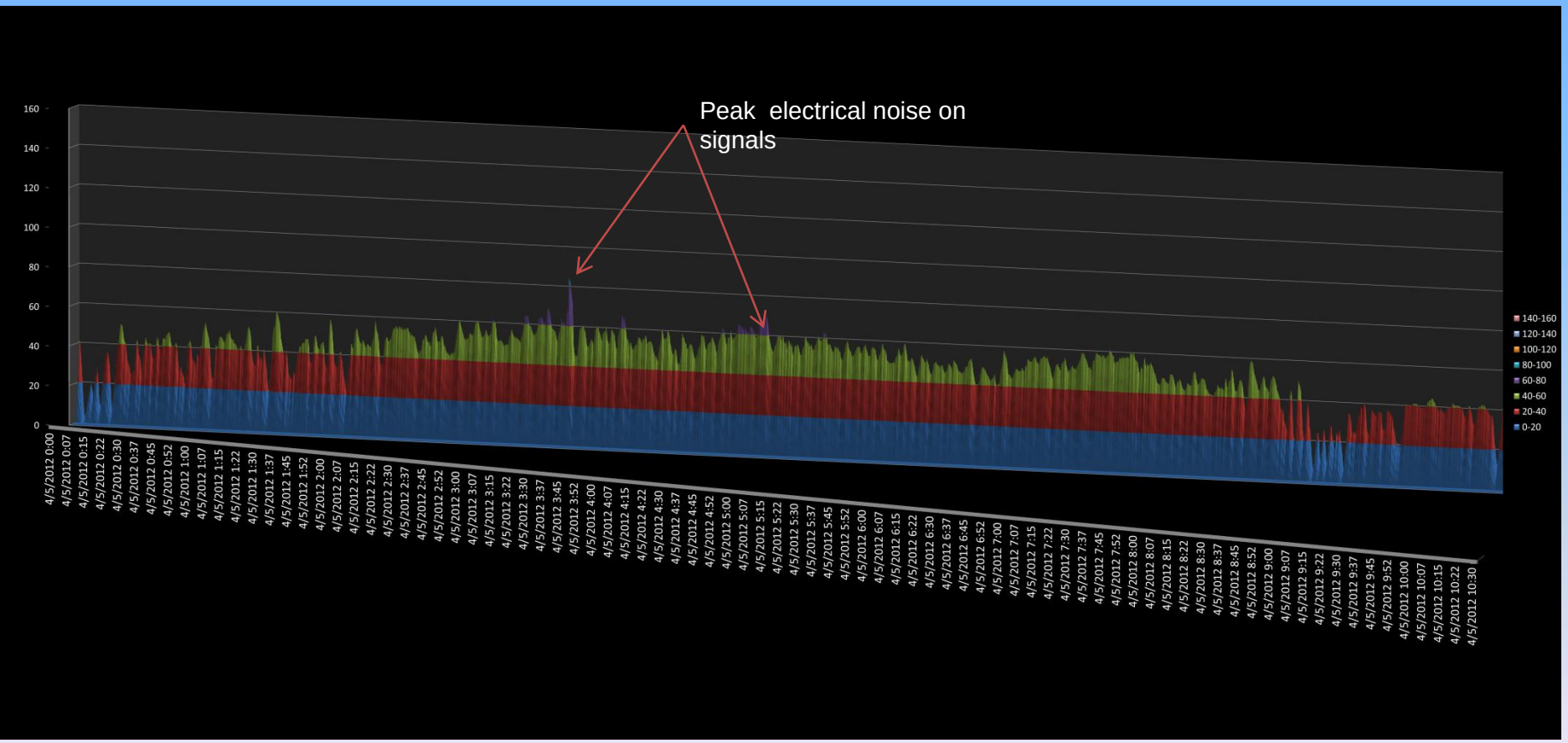
- Control Systems
- PLC/electronics
- Generators
- Economics
- Psychology
- Climbing

Wind TurbineTrainers

Lotus Trainer

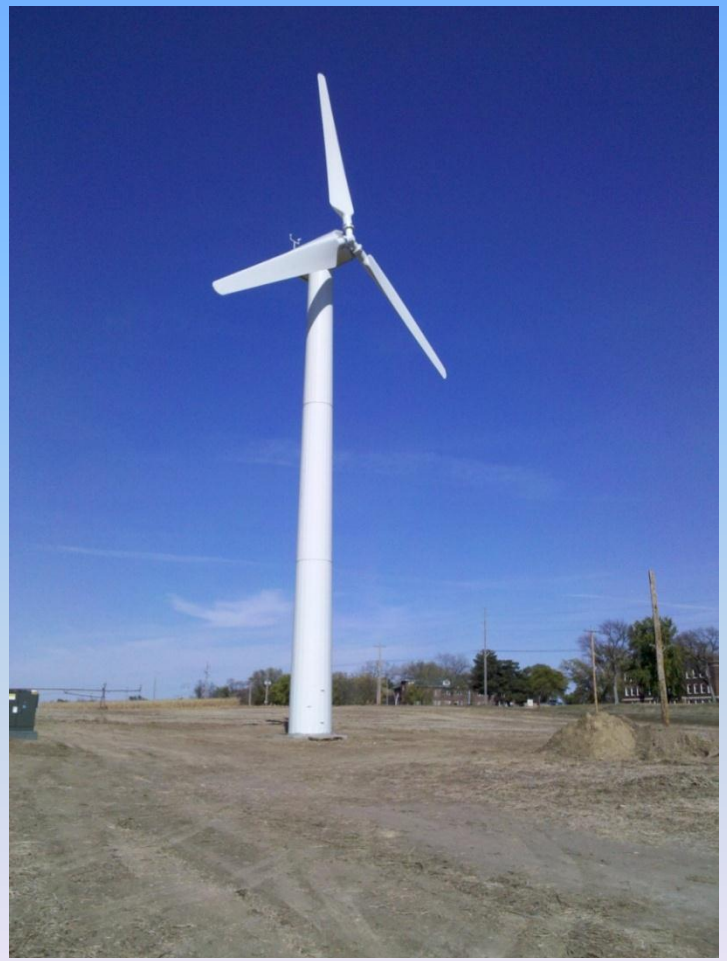
10Kw Cutaway Turbine

Trouble Shooting Skills Real Time



Micon 108, 100 kW

AWEA Training Standards



Second Semester:

- Air Foils/Composites
- Data Communications and Acquisition
- Turbine Siting
- Power Generation and Distribution
- Business Communications

Commercial Tower Climb

View From The Nacelle

northeast.edu
Northeast
community college
801 East Benjamin Ave., P.O. Box 469
Norfolk, NE 68702-0469
(402) 371-2020 (800) 348-9033

Wind Energy

Required Program of Study for
Associate of Applied Science Degree (2 years)

FRESHMAN YEAR

First Semester

Course	Credits
WIND 1010 Basic Electricity	3
WIND 1020 Basic Electricity Lab	2
WIND 1080 Wind Energy Fundamentals	3
WIND 1090 Wind Turbine Systems	3
WIND 1095 Wind Turbine Systems Lab	1
WIND 1255 Blueprint Reading	2
INFO 1000 Basic Computer Applications	2
MATH 1020 Applied Mathematics I	3
	Total 19

Second Semester

WIND 1155 Mechanical Systems for Wind Energy	3
WIND 2050 Fluid Fundamentals	2
WIND 2060 Fluid Fundamentals Lab	2
WIND 1058 Electrical and Operations Safety for Wind Energy	3
WIND 1085 Wind Energy Fund. Lab	2
WIND 1230 Motor Control	2
WIND 1240 Motor Control Lab	2
MATH 1060 Applied Mathematics II	3
	Total 19

Summer: 12 weeks

WIND 1300 Cooperative Internship I	8

SOPHOMORE YEAR

First Semester

Course	Credits
WIND 2110 Control Systems	3
WIND 2045 Programmable Logic Controllers	4
WIND 2070 Wind Electronics II Theory	2
WIND 2075 Wind Electronics II Lab	2
WIND 2080 Generator Theory	2
WIND 2085 Generator Lab	1
ECON 1010 Personal Finance	2
PSYC 1000 Human Relations	2
	Total 18

Second Semester

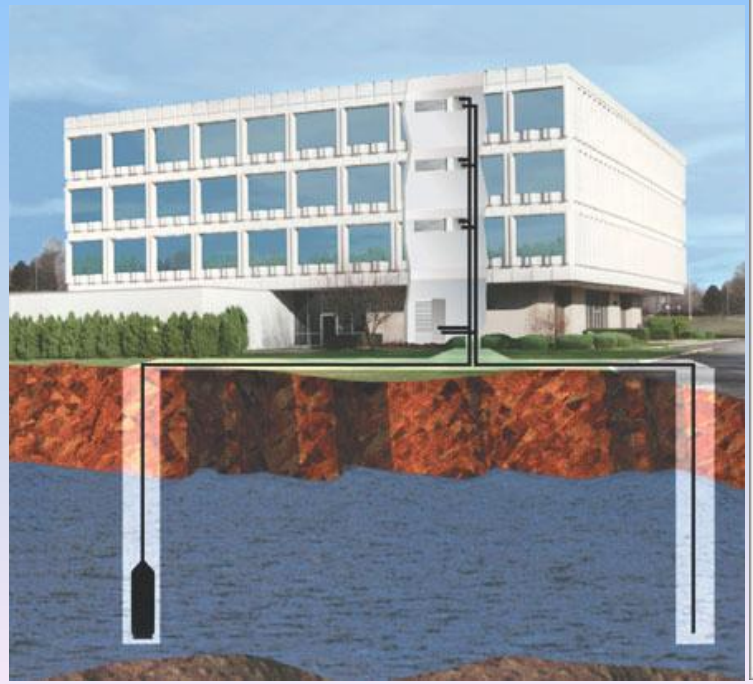
WIND 2090 Airfoils and Composite Repair	2
WIND 2260 Climbing Safety Lab	1
WIND 2270 Data Communications and Acquisition	4
WIND 2280 Wind Turbine Siting	3
WIND 2290 Power Generation & Distribution	2
BSAD 2050 Business Communications	3
	Total 15

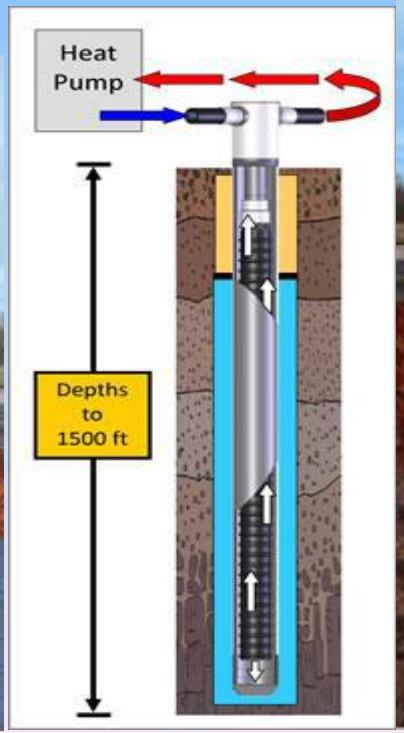
Total Credit Hours 79

Solar Energy

Ground-Coupled Heat Exchanger Considerations

- Vertical Closed-Loop
- Horizontal Closed-Loop
- Surface Water Closed-Loop
- Ground Water Open-Loop
- Standing Column Well





Bowman Geothermal

First AAS Wind Energy Degree Program in Nebraska

- Provide hands-on training to prepare students for "green jobs"
- Residential and mid-sized turbines to provide a complete array of experiences - residential to commercial applications
- Credit transfer opportunities within NE community colleges

Where the Power of Wind is Harnessed...

We're Northeast.

2012 Graduates

Wind Energy at

Northeast

community college

Norfolk, Nebraska

northeast.edu