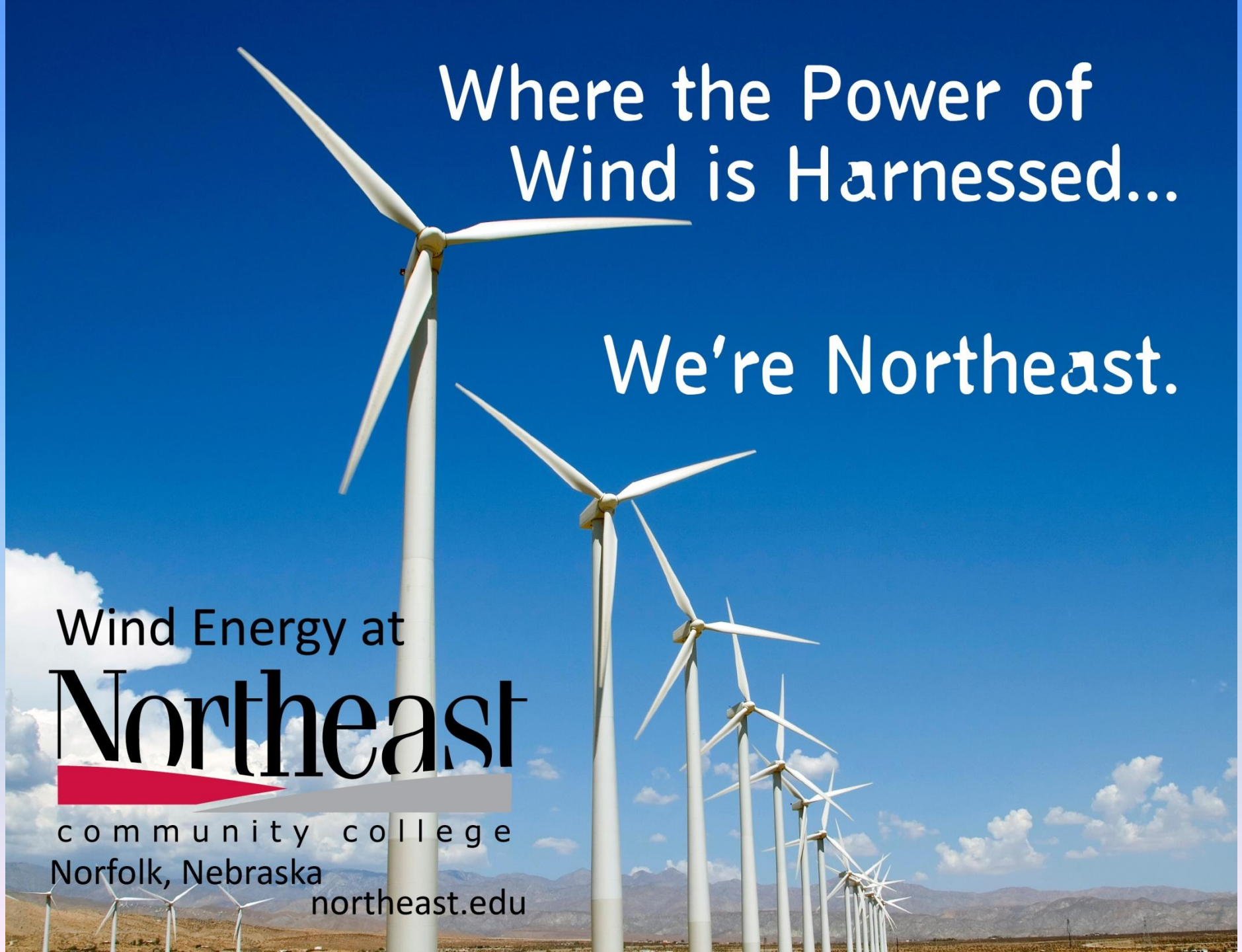
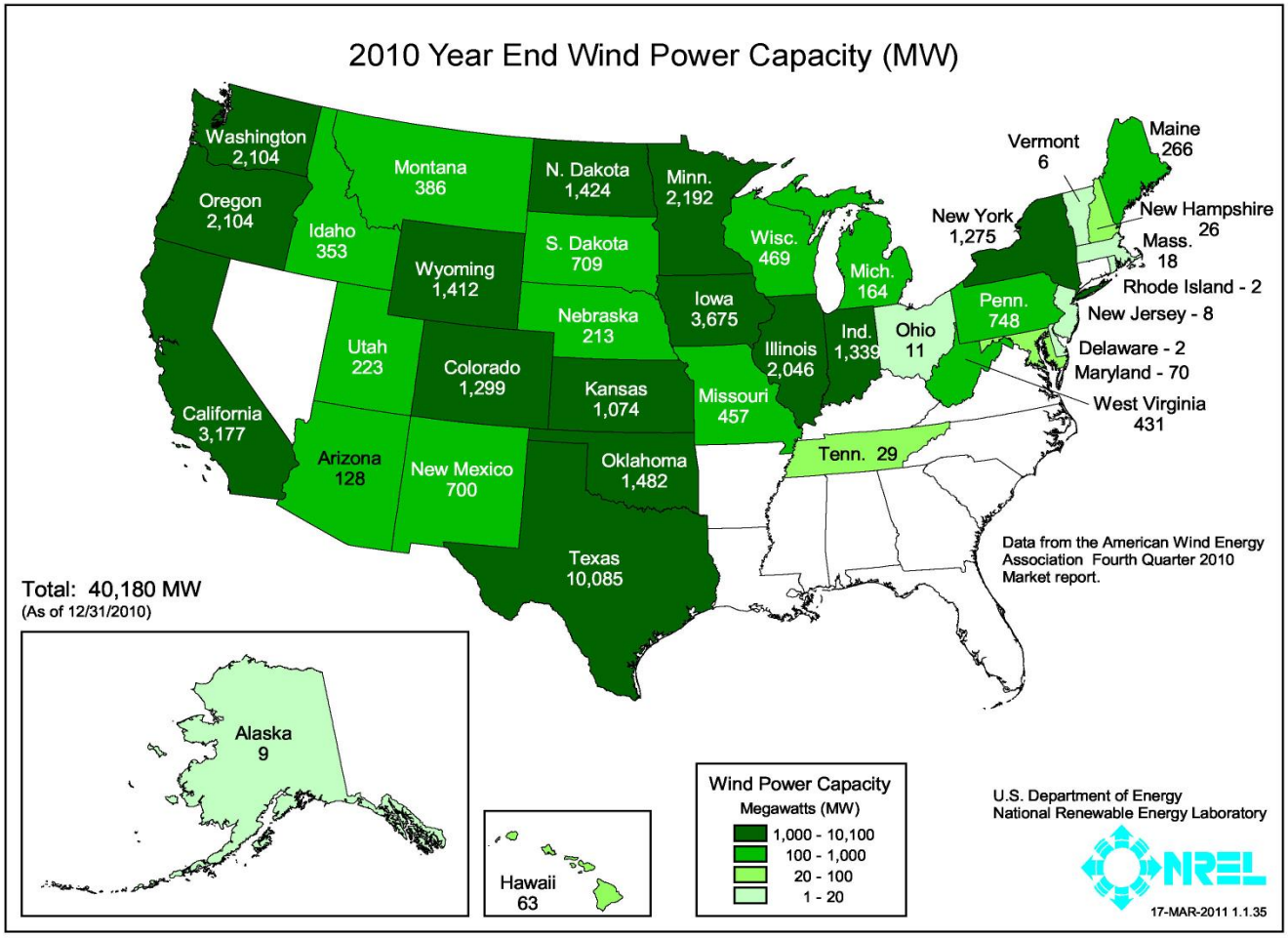
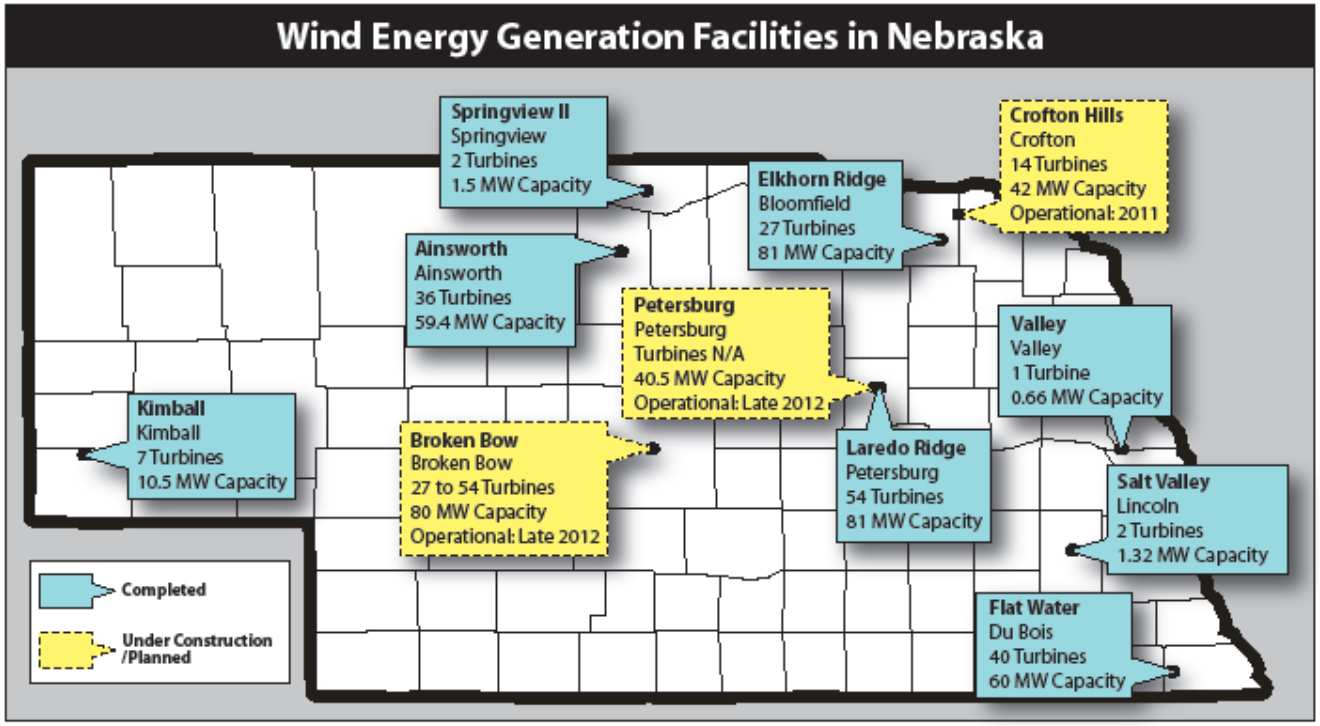

Where the Power of
Wind is Harnessed...
We're Northeast.
Wind Energy at
Northeast
community college
Norfolk, Nebraska
northeast.edu

# 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
Flat Water
Du Bois
40 Turbines
60 MW Capacity
Completed
Under Construction /Planned

# 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

# Control System

## SCADA/Ethernet Communication

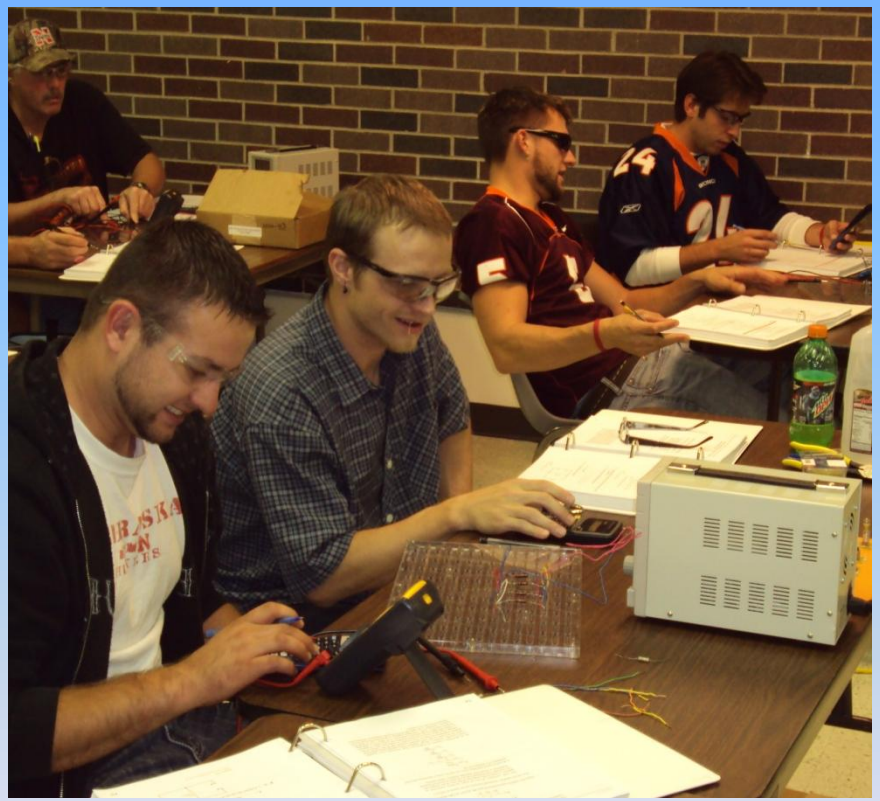
# Wind Powered Lighting

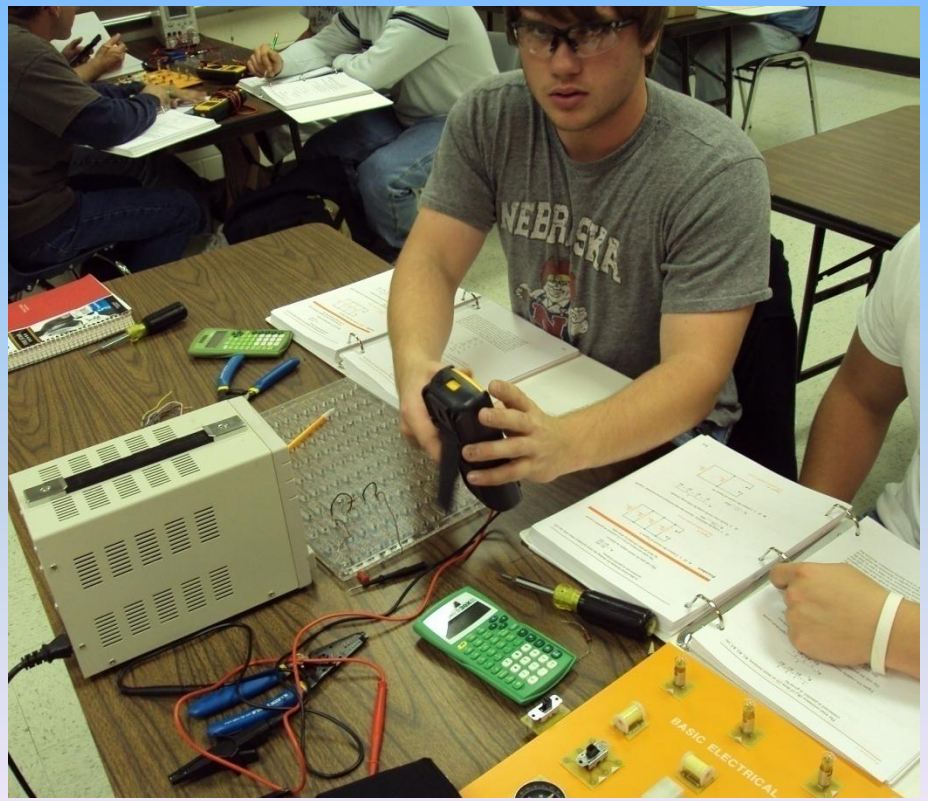
- T-5 Fluorescent lighting fixtures

# First Semester:

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

# Fundamentals of Electricity





# Proper Torque Procedures

# Climbing Exercises

- Rappelling
- Harness safety
- Rigging

# 100’ Lattice Tower Climb

# GE Turbine Blade

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

# Second Semester:

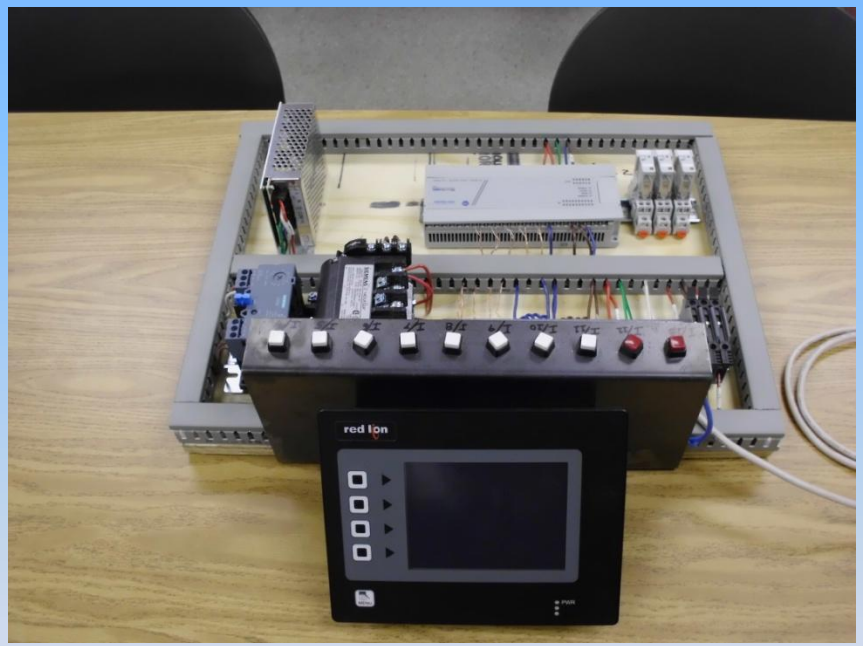
- Mechanical and Fluid Fundamentals
- Electrical and Operations Safety/CPR
- Motor Controls
- Continued Tower Climb/Repair Lab
- Commercial Tower Climb/Climbing Certificate

# Hydraulic Systems

# Motor Control Systems

# Second Year Program

## First Semester:

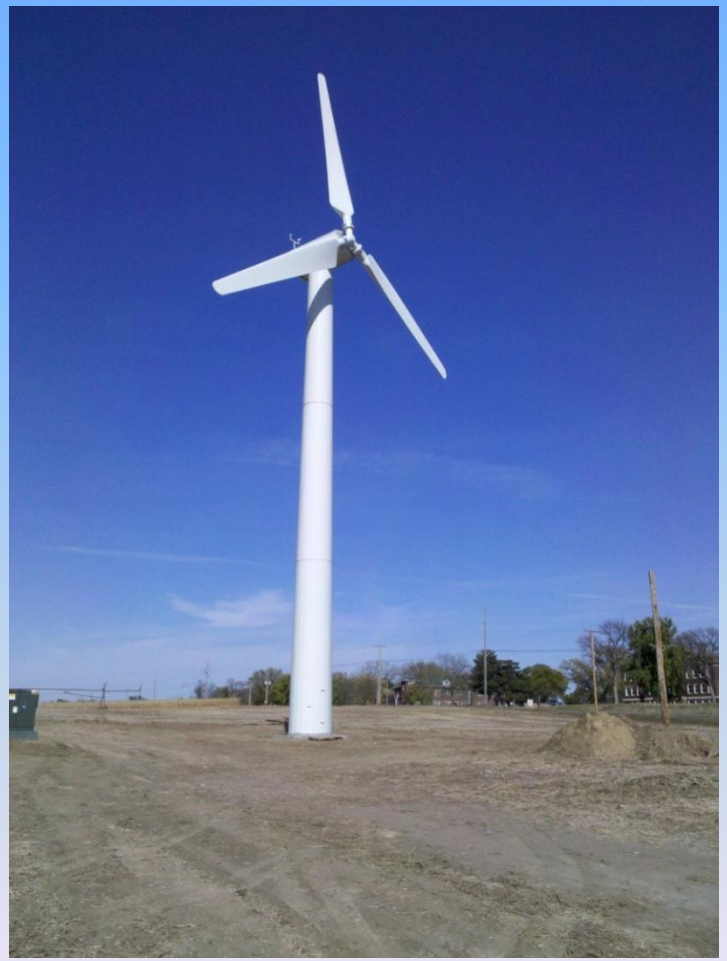



- Control Systems
- PLC/electronics
- Generators
- Economics
- Psychology
- Climbing

# 10kW Cut Away Model


# 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

# WNCC

## WIND TURBINE SERVICE TECHNICIAN

### 1st Semester

| Course No | Course Name | Lec | Lab | Cont. Hrs | Cred. Hrs | Prerequisites |
|---|---|---|---|---|---|---|
| ENER-1000 | Introduction To Wind Power | 45 | | 45 | 3 | |
| ENER-1010 | Basic Electricity | 30 | 45 | 75 | 3 | |
| ENER-1020 | Industry Tools, Tower Climbing And Rescue | 8 | 45 | 53 | 1.5 | |
| ENER-1030 | Windplant Systems | 8 | 45 | 53 | 1.5 | |
| ENER-1110 | Pitch, Yaw & Hydraulic System | 8 | 45 | 53 | 1.5 | |
| ENER-1120 | Safety Part I | 8 | | 8 | .5 | |
| ENER-1130 | Drive Train | 8 | 45 | 53 | 1.5 | |
| MATH-0151 | Electrical Math 1 | 45 | | 45 | 3 | PHYS-0151, ACFS-0070M or eCOMPASS |
| ENGL-0500 | Workplace Writing | 45 | | 45 | 3 | ACFS-0050W or Writing Placement Exam and ACFS-0060R or Reading Placement Exam |
| | | 205 | 225 | 430 | 18.5 | |

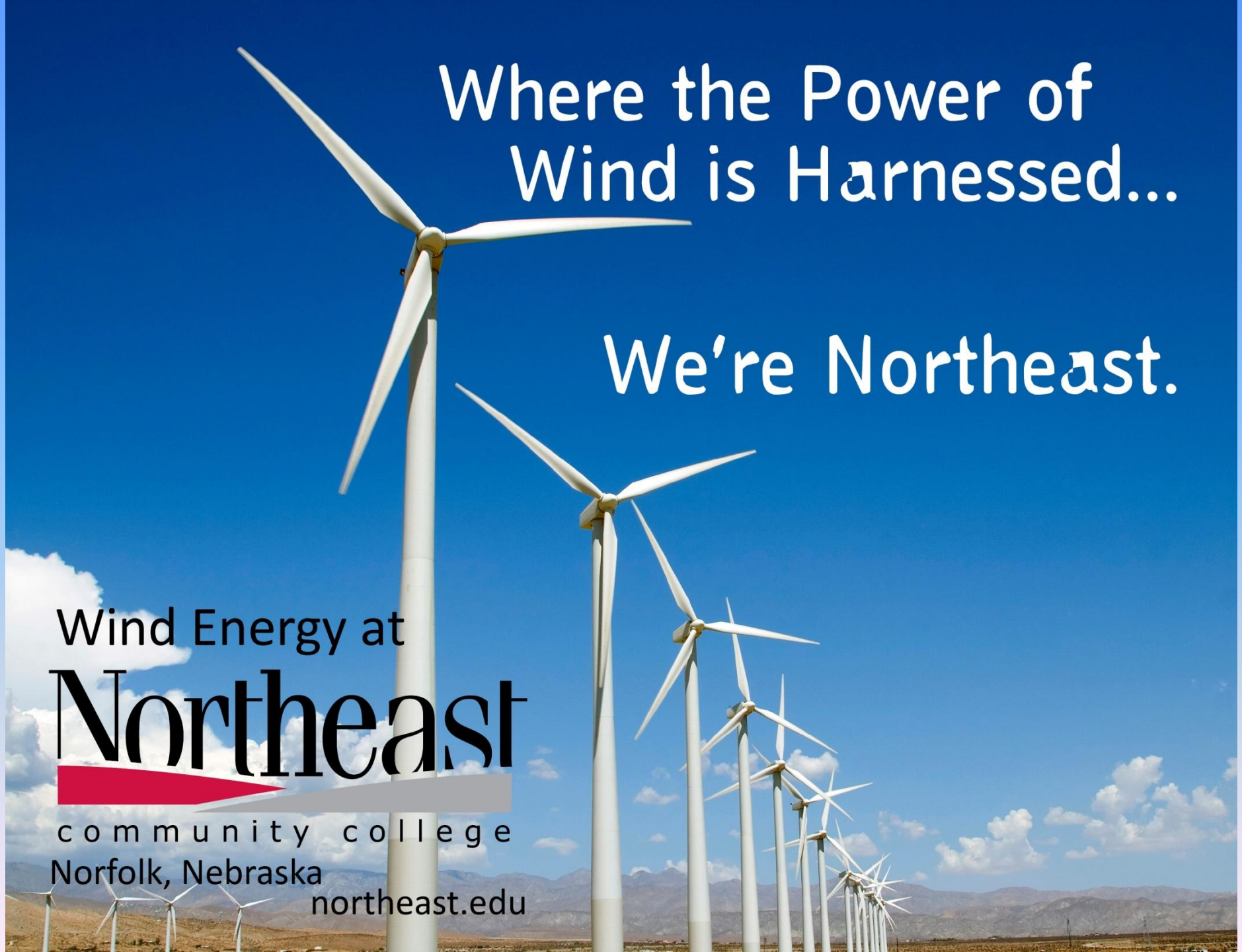
### 2nd Semester

| Course No | Course Name | Lec | Lab | Cont. Hrs | Cred. Hrs | Prerequisites |
|---|---|---|---|---|---|---|
| INFO-1110 | Microcomputer Applications | 45 | | 45 | 3 | |
| ENER-1210 | High Voltage | 30 | 45 | 75 | 3 | |
| ENER-1220 | Safety Part II | 8 | | 8 | .5 | |
| ENER-1230 | Uptower Electrical Systems | 30 | 45 | 75 | 3 | |
| ENER-1240 | Diagnostic Test Equipment | 30 | 45 | 75 | 3 | |
| ENER-1310 | Wind Turbine SCADA | 8 | 20 | 28 | 1 | |
| ENER-1320 | Safety Part III | 8 | | 8 | .5 | |
| ENER-1330 | Downtower Electric Systems | 22 | 20 | 42 | 2 | |
| ENER-1340 | Troubleshooting | 8 | 45 | 53 | 1.5 | |
| | | 189 | 220 | 409 | 17.5 | |

OSHA 30 Hour Training is required for employment

# 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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