COURSE SYLLABUS

Wind Turbine Troubleshooting and Repair

WIND 2455
Number

2 - 5 - 4
Lecture - Lab - Credit

Basic Reading Skills II, Writing Skills II, Wind Power Delivery Systems, and Industrial Automation
Prerequisite

This syllabus has been reviewed and is current on the date indicated.

Prepared By Shawn Weaver  Date 08/09/10

Reviewed By

Division Director/Designee Date
WIND 2455
Wind Turbine Troubleshooting and Repair
Course Syllabus

I. Instructor Information

Name: Shawn Weaver  
Phone: 325-236-8289

Campus Office: 4TDC 114  
email: shawn.weaver@sweetwater.tstc.edu

Office Hours: 8:00 – 5:00  
Advisement Hours  Tuesday-Friday 10:00-12:00

Department Chair: Keith Plantier  
Chair email: keith.plantier@tstc.edu

II. Class Times, Location
Lecture: TBD
Lab: TBD

III. Program Outcomes
(If appropriate. Program Outcomes are not listed for an interdisciplinary course)

A. The Wind Energy Technology student will demonstrate competent skills needed to maintain and repair electrical systems of wind turbines.
B. The Wind Energy Technology student will demonstrate competent skills in maintaining and repairing mechanical systems of wind turbines.
C. The Wind Energy Technology student will demonstrate competency in practicing safety skills in responding to hazards associated with wind turbines.
D. Demonstrate the concepts of supervisory control and data acquisition (SCADA) systems and data communications related to wind turbines.

IV. Course Description & Introduction
Operation, maintenance, troubleshooting, and repair of wind turbine electro-mechanical systems.

V. Learning Outcomes
The student will:
A. Use electrical, electronic, and mechanical equipment using switches, fuses, breakers, interlocks, isolating valves, and proper grounding techniques
The student will:
- Describe electrical and mechanical devices and their purpose
- Identify visually electrical components, control components, and mechanical elements of wind turbines
- Examine and use electrical schematics
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- Demonstrate proper methods of grounding electrical equipment and perform hot-cold-hot checks
- Demonstrate how to isolate both electrical and mechanical energy potentials
- Demonstrate proper use of personal protective equipment (PPE)
- Troubleshoot electrical/electronic system malfunctions
- Service wiring and circuitry components
- Conduct facilities maintenance

B. Use Supervisor Control and Data Acquisition (SCADA), historical data, and event logging
   The student will:
   - Examine SCADA systems
   - Demonstrate use of historical data and event logging

C. Research technical manuals, computer databases, regulatory documents, and part inventories on the Internet/Intranet
   The student will:
   - Use technical manuals
   - Research computer databases for regulatory documents and parts inventories

D. Use equipment configuration and maintenance history as a predictive tool
   The student will:
   - Develop a maintenance plan for a wind turbine
   - Use maintenance history to predict equipment failure
   - Examine equipment configuration as a predictive tool
   - Conduct condition analysis
   - Conduct scheduled maintenance on structural components and rotating equipment

E. Install, troubleshoot, and repair failure in mechanical and electrical equipment and computer systems
   The student will:
   - Troubleshoot electrical circuits to identify faulty components and repair
   - Troubleshoot mechanical failures and repair or replace faulty components
   - Troubleshoot faults in computer systems
   - Maintain and repair wind turbine parts and equipment
   - Diagnose and repair mechanical malfunctions

F. Solve problems and build employability skills such as critical thinking, adaptability and work ethic
   The student will:
   - Use critical thinking skills to correctly diagnose and repair turbine systems and components
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- Uses adaptability to locate all possible information within a reasonable period of time before forming a decision; readily make adjustments to work strategies and methods based on real-time turbine performance
- Exhibit a work ethic in completing work on time and consistently attending all scheduled classes and labs

Students may vary in their competency levels on these abilities. You can expect to acquire these abilities only if you honor all course policies, attend classes regularly, complete all assigned work in good faith and on time, and meet all other course expectations of you as a student.

V. Assessment Methods & Grading Policy

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Weekly Tests</td>
<td>20%</td>
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<tr>
<td>Mid Term</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Lab Exercises</td>
<td>20%</td>
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</tbody>
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VIII. Textbook/Reference Materials
WIND 2455 Troubleshooting and Repair
Schoolcraft Publishing

IX. Additional Resources & Supplies
Safety Glasses
Safety Toe Boots
Long Sleeve Shirt (natural fiber like cotton)
Pen/Pencil
Notebook

X. Class Participation Policy & Student Conduct
A. Texas State Technical College challenges students to be learners who assume responsibility for being part of a community of scholars. Students presence and participation in the classroom is an important component of this challenge. TSTC offers students an education that prepares them for professional employment. Students are encouraged to develop a professional work ethic that reflects responsibility, initiative, and teamwork.

B. Students are expected to attend all classes. When students are absent from class they
miss opportunities to contribute to the learning environment of the classroom and develop a pattern that will not be tolerated in a professional workplace.

C. Students are responsible for all assigned course work and will not be absolved of this responsibility. Students are obligated to have all class work completed at the due date and time. Punctual and regular attendance is vital to this obligation, and any absences excused or not do not change this obligation.

D. Students who are absent more than 15% of the scheduled classes and labs may receive an F for the course.

E. Students are expected to conduct themselves in a professional manner, and dress in proper attire and PPE for the class being presented. Students are expected to act responsibly and take the consequences for his/her actions.

F. An atmosphere of respect will be maintained at all times in the classroom, and any open displays of prejudice, harassment etc. will not be tolerated.

G. Any student who disrupts the classroom will be asked to leave and will receive a zero and an absent mark for the day. A second disruption by that student will be grounds for the student to be administratively dropped from the class, and disciplinary action will be taken as appropriate.

XI. Safety

- Campus building occupants are required to evacuate buildings when a fire alarm activates. Alarm activation or announcement requires exiting and assembling outside.

- Familiarize yourself with all exit doors of each classroom and building you may occupy while receiving instructions. The nearest exit door may not be the door you used when entering the building.

- Students requiring evacuation assistance should inform the instructor during the first week of class.

- In the event of evacuation, follow the faculty’s or class instructor’s instructions.

- Do Not re-enter a building unless given instructions by the Fire Department, Campus/Local Police, or Fire Prevention Services.
XII. Special Needs

If you have a condition, such as a physical or mental disability, which will make it difficult for you to carry out the work as outlined, or which will require extra time on examinations, please notify the Counseling and Testing Office during the first week of the course so that appropriate arrangements can be made.

XIII. Course Schedule

Week 1: Introduction
    Introduction to troubleshooting, techniques and how to prepare for Troubleshooting.

Week 2-5: Troubleshooting with electrical schematics
    Understanding how to recognize symbols on schematics and use these electrical schematics to troubleshoot electrical systems of a Wind Turbine.

Week 6-7 Troubleshooting A/C and D/C motors. Mid-Term Exam

Week 8-9 Troubleshooting Power Supplies and Power Conditioners

Week 10-13 Maintenance
    Understanding the difference between Planned and Preventive Maintenance.
    Understand the need for PM and set up a PM program.

XIV. Instructor CV

Shawn Weaver Sr.

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#114
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Shawn.weaver@sweetwater.tstc.edu

Associate of Applied Science
Texas State Technical College Marshall
Industrial Maintenance Electrician

Advanced Workplace Certificate
Texas State Technical College Marshall
Phi Theta Kappa

Employment History: GE (Wind Energy) Wind Tech II, Dana Corp (Structural Solutions) Controls Technician, Tegron Automation International (Industrial Controls Manufacturing)