

**CLARENDON COLLEGE**

**Division of Business and Technology**

**Course Name:** *Wind 2310 Wind Turbine Materials and Electromechanical Equip.*

**Credit Hours:** 3

**Semester:** *Spring 2012*

**Classroom Location:** *Pampa Center Wind building room V04*

**Instructor:** *Havens, John*

**Office Location:** *Pampa*

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**Office Hours:** 1:30pm-4:30pm Mon-Thurs; Fri 8:00 am – 12:00 pm

**I. Course Description:**

Identification and analysis of the components and systems of wind turbines

**II. End of Course Learning Outcomes and Key Activities**

**WECM:** Describe impacts of heat generation on various materials and heat control mechanisms; define the effects of machining and heat treating on metals as they relate to predictable failures; identify components of turbine system; describe types and specifications of fasteners; and identify the effects of torque, lubricants, and hydraulic types of gear boxes.

**Key Activities from the Wind Turbine Technician Skill Standards:**

- **(2.1) Conduct condition analysis**
- **(3.2) Conduct material condition inspections**
- **(6.4) Maintain tools and equipment**

Recognized by the Texas Skill Standards Board: <http://www.tssb.org>

### **III. Learning Outcomes:**

- a. Describe the impacts of heat generation on various materials and heat control mechanisms; define the effects of machining and heat treating on metals as it relates to predictable failures
- b. Identify gel coats, UV characteristics, flexibility, impact resistance of various coatings and how they are applied.
- c. Identify types and specifications of fasteners; recognize the effects of torque, lubricants, and hydraulic bolt stretchers, tensioners, and high torque fasteners
- d. Inspect gears, scaling, types of gear boxes, and probable causes of failure
- e. Identify RPM, gear ratios, and failure mechanisms
- f. Identify type, application, and compatibility of different lubricants
- g. Identify electrical control system components such as circuit protection devices, sensors, relays, contactors, actuators, timers counters, motors, and various types of AC and DC drives
- h. Convert units between metric and U.S. standard
- i. Demonstrate safety procedures required by OSHA 1910, NPFA, IEEE 519, International Electric and National Electric Code standards

### **IV. Course Requirements:**

**Textbook Required:** Textbook(s) (Required): To be purchased at Clarendon College book store

1. Wind 2310, Wind Turbine Materials and Electromechanical Equipment

### **Other Requirements:**

- Class Attendance is required!!! Students will only be allowed to miss 3 class periods in the 16 week session.
- **No late homework will be accepted**
- Personal Tools and Supplies include: scientific calculator, and pencils, note paper (recommend graphing or engineering paper), etc...

<b>Tentative Course Schedule</b>	
<b>Wind 2310 Wind Turbine Materials and Electromechanical Equipment</b>	
<b>Lecture #</b>	<b>Lecture Topic</b>
<b>1</b>	<b>Introduction to Metals</b>
<b>2</b>	<b>Environmental Conditions</b>
<b>3</b>	<b>Manufacturing Processes</b>
<b>4</b>	<b>Heat Treatment</b>
<b>5</b>	<b>Metric Measurement</b>
<b>6</b>	<b>Gears</b>
<b>7</b>	<b>Gear Drives</b>
<b>8</b>	<b>Adjustable-Speed Drives</b>
<b>9</b>	<b>Aligning Shafts</b>
<b>10</b>	<b>Shaft Coupling Devices</b>
<b>11</b>	<b>Clutches and Brakes</b>
<b>12</b>	<b>Principles of Lubrication</b>
<b>13</b>	<b>Characteristics of Lubricants</b>
<b>14</b>	<b>Fasteners</b>

Final exam on date/time as posted on Final Exam Schedule on Clarendon College website

Course requirements include problems and exercises, unit tests and final examinations derived from lectures. Assignments will be due one week from the day they were assigned unless special instruction is given by the instructor. Students must actively participate in class and attend class unless arrangements are made in advance for absence.

Methods and components of evaluation and grading are listed in the following:

Problems and exercises:	20%
Quizzes:	30%
Attendance:	20%
Final:	30%
<hr/> Total	100%

The final semester grades will be figured as set in the current catalog:

90 and above = A

80-89 = B

70-79 = C

60-69 = D

Below 60 = F

A student's final grade will be made available through Campus Connect at Clarendon College's website.

### **Methods of Instruction:**

This is a hybrid class, meaning that there will be little to no lecture time, all of the assignments and lecture info will be available online thru Web CT. The time that is listed on your schedule, is actually time that is required for labs only.

It will be up to you to log in and get your assignments and take your quizzes, all homework will be due a week from the time it is assigned. I cannot stress how important it will be to read the chapters that are assigned and do the homework associated with that particular chapter!!!

### **Classroom Policies:**

- Food will not be permitted in the classroom.
- Tobacco products will not be permitted in the classroom.

### **Classroom Conduct**

Failure to comply with lawful direction of a classroom instructor is a disruption for all students enrolled in the class. Cheating violations include, but are not limited to: (1) obtaining an examination, classroom activity, or laboratory exercise by stealing or collusion; (2) discovering the content of an examination, classroom activity, laboratory exercise, or homework assignment before it is given; (3) using an unauthorized source of information during an examination, classroom activity, laboratory exercise, or homework assignment; (4) entering an office or building to obtain unfair advantage; (5) taking an examination for another person; (6) completing a classroom activity, laboratory exercise, homework assignment, or research paper for another person; (7) altering grade records; (8) using any unauthorized form of electronic communication device during an examination,

classroom activity, or laboratory exercise; (9) Plagiarism. Plagiarism is the using, stating, offering, or reporting as one's own, an idea, expression, or production of another person without proper credit.

Disciplinary actions for cheating in a course are at the discretion of the individual instructor. The instructor of that course will file a report with the Dean of Students when a student is caught cheating in the course, whether it be a workforce or academic course. The report shall include the course, instructor, student's name, and the type of cheating involved.

Students who are reported as cheating to the Dean of Students more than once shall be disciplined by the Dean. The Dean will notify all involved parties within fourteen days of any action taken.

### **American with Disabilities Act Statement:**

Clarendon College provides reasonable accommodations for persons with temporary or permanent disabilities. Should you require special accommodations, notify the Office of Student Services (806-874-3571 or 800-687- 9737). We will work with you to make whatever accommodations we need to make.

### **Dropping a Course:**

A student who is enrolled in a developmental course for TSI purposes may not drop his/her only developmental course unless the student completely withdraws from the college. A student may drop any other course with a grade of "W" any time after the census date for the semester and on or before the end of the 12<sup>th</sup> week of a long semester, or on or before the last day to drop a class of a term as designated in the college calendar. The request for permission to drop a course is initiated by the student by procuring a drop form from the Office of Student Services. (Refer to other policies concerning this issue in the current college catalog online.)

### **Withdrawal from College:**

When a student finds it necessary to withdraw from school before the end of the semester, he or she should obtain a withdrawal form from the Office of Student Services. Students may also withdraw from the college by sending a written request for such action to the Registrar's Office. The request must include the student's signature, the student's current address, social security number and course information details. Students who withdraw after the census date for the semester and on or before the end of the 12<sup>th</sup> week of a long semester, or on or before the last day to drop a class of a term as designated in the college calendar will be assigned a grade of "W."

**Classroom requirements:**

The operation of cell phones, MP3 type devices, personal computers, or any other such devices is strictly prohibited during class sessions. The result of such use will result in a zero grade for the event (quiz/test) for that day including final exam day. Cheating, plagiarism or other dishonest acts shall be dealt with to the extent of dismissal from the class permanently on a case by case basis. Under no circumstance will an individual be exonerated after a second incidence, but will be immediately dropped.

Any missed quizzes or exams must be taken within 1 week of the date missed. It is the student's full responsibility to make arrangements to make up a quiz or exam at a time agreeable to the instructor. The Final exam will be taken on the prescribed day or arranged day prior to the final exam. No exceptions.