COURSE OUTLINE

DIVISION: Workforce Development

COURSE: WND 1200 - Wind Energy Concepts

Date: Spring 2014

Credit Hours: 3

Prerequisite(s): None

Delivery Method:

- ✔ Lecture 2 Contact Hours (1 contact = 1 credit hour)
-  Seminar 0 Contact Hours (1 contact = 1 credit hour)
- ✔ Lab 2 Contact Hours (2 contact = 1 credit hour)
- - Clinical 0 Contact Hours (3 contact = 1 credit hour)
- - Online
- - Blended

Offered: ✔ Fall  □ Spring  □ Summer

IAI Equivalent –Only for Transfer Courses-go to http://www.itransfer.org:

CATALOG DESCRIPTION:
This course is the first course in the wind energy program. Topics include the history, economics, operation and terminology of the wind turbine. This class also introduces students to the wind energy trainers and has a lab component.
GENERAL EDUCATION GOALS ADDRESSED
[See the last page of this form for more information.]

Upon completion of the course, the student will be able:
[Choose those goals that apply to this course.]

☐ To apply analytical and problem solving skills to personal, social and professional issues and situations.
☐ To communicate orally and in writing, socially and interpersonally.
☐ To develop an awareness of the contributions made to civilization by the diverse cultures of the world.
☒ To understand and use contemporary technology effectively and to understand its impact on the individual and society.
☐ To work and study effectively both individually and in collaboration with others.
☐ To understand what it means to act ethically and responsibly as an individual in one’s career and as a member of society.
☐ To develop and maintain a healthy lifestyle physically, mentally, and spiritually.
☐ To appreciate the ongoing values of learning, self-improvement, and career planning.

EXPECTED LEARNING OUTCOMES AND RELATED COMPETENCIES:
[Outcomes related to course specific goals.]

Upon completion of the course, the student will be able to:

Competency 1 History of Wind Industry
  Competency 1.1 Discuss the history of the Wind Industry
  Competency 1.2 Label the components of a Wind Turbine

Competency 2 Trainer safety
  Competency 2.1 Apply Lock out / Tag out procedures
  Competency 2.2 Contrast Safety Panels and Guards
  Competency 2.3 Show Proper Grounding
  Competency 2.4 Assess equipment Protection

Competency 3 Wind Terminology and Concepts
  Competency 3.1 Compare Energy, Power and Work
  Competency 3.2 Analyze setting
  Competency 3.3 Explain Breaking
  Competency 3.4 Analyze Loading

Competency 4 Wind Systems
  Competency 4.1 Explain the Controller function
  Competency 4.2 Calculate Power consumption and Efficiency
  Competency 4.3 Illustrate the Inverter

Competency 5 Transmission and Distribution
  Competency 5.1 Explain Power Generation
  Competency 5.2 Describe Power Transmission
  Competency 5.3 Analyze a Power Distribution Grid
  Competency 5.4 Contrast On and Off Grid Operation
  Competency 5.5 Solve Troubleshooting issues

Competency 6 Going Green
  Competency 6.1 Defend the economics of the Wind Industry
  Competency 6.2 Discuss Wind Industry Careers
COURSE TOPICS AND CONTENT REQUIREMENTS:
History of Wind Industry
Economics of Wind Industry
Wind Turbine Components
Lab Safety
Terminology
Wind Turbine Concepts
Power Ratings and distribution Systems
Going Green
Meteorology

INSTRUCTIONAL METHODS:
Lecture
Lab
Simulations

INSTRUCTIONAL MATERIALS:
Lab Volt and Amatrol Student Manuals
Lab Volt Solar/Wind Energy Training system Trainers
Amatrol Wind energy trainers

STUDENT REQUIREMENTS AND METHODS OF EVALUATION:
90% and up A
80% - 89% B
70% - 79% C
60% - 69% D
00% - 59% F

Quizzes 10%
Labs 30%
Tests 20%
Midterm 20%
Final 20%

Some quizzes and test may be performance based

OTHER REFERENCES
## Course Competency/Assessment Methods Matrix

### WND 1200 - Wind Energy Concepts

For each competency/outcome place an “X” below the method of assessment to be used.

#### Assessment Measures – Are direct or indirect as indicated. List competencies/outcomes below.

<table>
<thead>
<tr>
<th>Assessment Measures</th>
<th>Direct/Indirect</th>
<th>Direct</th>
<th>Indirect</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Discuss the history of the Wind Industry</td>
<td>X</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>1.2 Label the components of a Wind Turbine</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>2.1 Apply Lock out / Tag out procedures</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
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<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2.3 Show Proper Grounding</td>
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<td></td>
<td>X</td>
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<td>3.1 Compare Energy, Power and Work</td>
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<tr>
<td>3.2 Analyze setting</td>
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<td></td>
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</tr>
<tr>
<td>3.4 Analyze Loading</td>
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<td></td>
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</tr>
<tr>
<td>4.1 Explain the Controller function</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>4.2 Calculate Power consumption and Efficiency</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>4.3 Illustrate the Inverter</td>
<td>X</td>
<td></td>
<td>X</td>
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<tr>
<td>5.1 Explain Power Generation</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>5.2 Describe Power Transmission</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
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</table>
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<table>
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<th>Assessment of Student Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.3 Analyze a Power Distribution Grid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.4 Contrast On and Off Grid Operation</td>
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<td></td>
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<tr>
<td>5.5 Solve Troubleshooting issues</td>
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<tr>
<td>6.1 Defend the economics of the Wind Industry</td>
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<tr>
<td>6.2 Discuss Wind Industry Careers</td>
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</table>

### Assessment Options

- Article Review
- Case Studies
- Group Projects
- Lab Work
- Oral Presentations
- Pre-Post Tests
- Quizzes
- Written Exams
- Artifact Self Reflection of Growth
- Capstone Projects
- Comprehensive Written Exit Exam
- Course Embedded Questions
- Multi-Media Projects
- Observation
- Writing Samples
- Portfolio Evaluation
- Real World Projects
- Reflective Journals
- Applied Application (skills) Test
- Oral Exit Interviews
- Accreditation Reviews/Reports
- Advisory Council Feedback
- Employer Surveys
- Graduate Surveys
- Internship/Practicum/Site Supervisor Evaluation
- Licensing Exam
- In Class Feedback
- Simulation
- Interview
- Written Report