

ILLINOIS VALLEY COMMUNITY COLLEGE



COURSE OUTLINE

DIVISION: Workforce Development

COURSE: WND 2200 - Wind Turbine Control, Operation and Maintenance

Date: Spring 2014

Credit Hours: 4

Prerequisite(s): WND 1200 and WND 1210

Delivery Method: **Lecture** **2 Contact Hours** (1 contact = 1 credit hour)
 Seminar **0 Contact Hours** (1 contact = 1 credit hour)
 Lab **4 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 covers the relationships between mechanics, electronics, and wind energy to operate, control, and maintain a wind turbine. Major lab time will be devoted to troubleshooting and field testing techniques.

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 Basics of Operation

- Competency 1.1 Assess and Adjust Hydraulic Servo system
- Competency 1.2 Assess and Adjust Electronic Servo system
- Competency 1.3 Describe Operation strategy
- Competency 1.4 Report Operation Procedures

Competency 2 Basics of Control

- Competency 2.1 Show control of Pitch
- Competency 2.2 Show control of Yaw
- Competency 2.3 Apply Visualization software
- Competency 2.4 Describe remote access

Competency 3 Maintenance and Troubleshooting

- Competency 3.1 Interpret wiring diagrams
- Competency 3.2 Confirm wiring and cables
- Competency 3.3 Confirm brake procedures
- Competency 3.4 Apply use of a Technical Manual
- Competency 3.5 Produce a Scheduled Maintenance Procedure
- Competency 3.6 Explain Extreme Weather Condition Procedures
- Competency 3.7 Solve Turbine Troubleshooting issues
- Competency 3.8 Report Data Logging and Monitoring

COURSE TOPICS AND CONTENT REQUIREMENTS:

Servo Control
Pitch Control
Yaw Control
External Safety Devices
Hub Safety
Blade Troubleshooting
Hub Functions
Battery Operations
Emergency Feathering
Hub Fault Messages
System Troubleshooting
Maintenance

INSTRUCTIONAL METHODS:

Lecture
Lab
Simulation

INSTRUCTIONAL MATERIALS:

Amatrol Lab Manual
CD
Amatrol Trainer

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

WND 2200 - Wind Turbine Control, Operation and Maintenance	Assessment Options																															
For each competency/outcome place an "X" below the method of assessment to be used.	Assessment of Student Learning	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	Assignment
Assessment Measures – Are direct or indirect as indicated. List competencies/outcomes below.	Direct/ Indirect	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	I	I	I	I	D	D			X			X	X
3.7 Solve Turbine Troubleshooting issues				X	X		X	X							X													X			X	X
3.8 Report Data Logging and Monitoring														X																X	X	X