

ILLINOIS VALLEY COMMUNITY COLLEGE



COURSE OUTLINE

DIVISION: Career and Technical Programs

COURSE: ELE 2204; Power Generation & Distribution

Date: 11/10/10

Credit Hours: 3

Prerequisite(s): ELE 1202

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:

The Power Generation & Distribution course looks at the generation, distribution and transmission of electricity as it relates to wind farm production and maintenance. This is a two hour lecture and two hour lab course with a large hands-on 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 Basics of Electrical Power Systems

Competency 1.1 Relate Utilities, Customers and Regulatory Authorities

Competency 1.2 Define Electrical Transmission

Competency 1.3 Describe Power Generation

Competency 1.4 Calculate Voltage Levels

Competency 1.5 Describe Power Generation

Competency 1.6 Create an Impedance and Reactance Diagram

Competency 2 Electrical Power Distribution

Competency 2.1 Describe Load Classifications

Competency 2.2 Calculate Power and Utility Factors

Competency 2.3 Analyze Voltage Levels

Competency 2.4 Describe Transformer Characteristics

Competency 2.5 Demonstrate Transformer Short and Open Tests

Competency 2.6 Wire a Three Phase Transformer

Competency 2.7 Describe Proper use of Distribution equipment

Competency 2.8 Describe Substation Protection and Trends

Competency 2.9 Relate Residential and Industrial Distribution Layouts

Competency 3 Electrical Power Transmission

Competency 3.1 Describe System Stability

Competency 3.2 Confirm Voltage Levels

Competency 3.3 Calculate Transmission Line RCL

Competency 3.4 Calculate Line Loss

Competency 3.5 Calculate Line Faults

Competency 3.6 Explain Line Protection

Competency 3.7 Determine Conductor Sag and Tension

Competency 3.8 Analyze Conductor Vibration

COURSE TOPICS AND CONTENT REQUIREMENTS:

Introduction to Electrical Power
Basic concepts and 3 phase review
Generators
Transformers
Distribution System Layout
Distribution Transformers
Distribution Equipment
Substations
Distribution Line Construction
Transmission System
Transmission Line Parameters
Faults and Protection
Transmission Line Construction

INSTRUCTIONAL METHODS:

Lecture
Lab
Simulation

INSTRUCTIONAL MATERIALS:

“Electrical Power and Transmission” Prentice Hall, Faulkenberry and Coffey,
ISBN: 0-13-249947-9

Assorted Lab Materials and Equipment
3 Phase Power supply
Transformers and Transmission cable
Generation and Transmission Trainers

STUDENT REQUIREMENTS AND METHODS OF EVALUATION:

Standard Hand tools from ELE 1202, and ELE 1206.

90% and up	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
00% - 59%	F

Quizzes / Test	30%
Labs	30%
Midterm	20%
Final	20%

Some quizzes and test may be performance based

OTHER REFERENCES

Ugly's Book
OSHA
NFPA 70-E

Course Competency/Assessment Methods Matrix

ELE 2204; Power Generation & Distribution	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							
Competency 1.1 Relate Utilities, Customers and Regulatory Authorities								X																								X
Competency 1.2 Define Electrical Transmission									X																							X
Competency 1.3 Describe Power Generation				X		X	X	X	X																			X				
Competency 1.4 Calculate Voltage Levels				X					X																							
Competency 1.5 Describe Power Generation			X																													X
Competency 1.6 Create an Impedance and Reactance Diagram				X																							X					X
Competency 2.1 Describe Load Classifications								X	X																			X				X
Competency 2.2 Calculate Power and Utility Factors				X		X	X	X	X																							
Competency 2.3 Analyze Voltage Levels				X		X	X	X	X																							X
Competency 2.4 Describe Transformer Characteristics				X		X	X																									

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Competency 2.5 Demonstrate Transformer Short and Open Tests				X				X																																		
Competency 2.6 Wire a Three Phase Transformer				X				X																																		
Competency 2.7 Describe Proper use of Distribution equipment								X																																		
Competency 2.8 Describe Substation Protection and Trends		X		X			X																																			
Competency 2.9 Relate Residential and Industrial Distribution Layouts		X						X																																		
Competency 3.1 Describe System Stability				X			X																																			
Competency 3.2 Confirm Voltage Levels				X				X																																		
Competency 3.3 Calculate Transmission Line RCL							X																																			
Competency 3.4 Calculate Line Loss				X				X																																		
Competency 3.5 Calculate Line Faults				X				X																																		
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