###### COURSE SYLLABUS

###### Semester: Year: 2013

**Mission Statement:**

Richard J. Daley College provides high-quality education which leads to academic success, career development, and personal enrichment that fulfill diverse community needs.

###### Course (Discipline): Manufacturing Technology Number: 191 Section:       IAI#:

**Course Title:** Industrial Electricity **Length of Course (Weeks):** 16

**Credit Hours:** 4 **Lecture Hours:** 2 **Lab Hours:** 4 **Contact Hours:** 6

**Meeting Day(s):**       **Times:**       **Building:**       **Classroom #:**

**Syllabus can be found on Blackboard website at** [**https://ccc.blackboard.com/webapps/login/**](https://ccc.blackboard.com/webapps/login/)**.**

###### Dean, College to Careers in Advanced Manufacturing \_\_Ray Prendergast\_\_\_\_\_\_\_

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#### Office hours:

**Course Description**:

A study of DC and AC electricity as applied to industrial circuits. The topics include: fundamentals of circuit analysis; single and three phase circuits; and parameters, safety issues in industrial electricity, such as current, voltage, and power and troubleshooting methods using test equipment. Writing assignments, as appropriate, are a part of the course.

**Course Prerequisites**:

Eligibility for Math 99 and Reading 99, or Consent of Department Chairperson.

**Students Course is Expected to Serve:**

Students enrolled in the Manufacturing Technology program. This course is required for the AAS in Manufacturing Technology.

**Course Objectives**:

1. Develop an understanding of the basic circuit parameters such as voltage, current, resistance/impedance, and power.
2. Understand the difference between AC and DC circuits and apply circuit analysis principles to calculate the basic parameters.
3. Know the difference between a single phase and a three phase supply.
4. Understand the concept of magnitude and phase as applied to electrical signals.
5. Read simple electrical schematic diagrams.

**Student Learning Outcomes:**

Upon completion of this the student will be able to:

1. Measure basic circuit parameters with various instruments.
2. Analyze simple DC and AC series and parallel electrical circuits.
3. Apply Ohm’s Law to calculate:
   1. Voltage
   2. Current
   3. Resistance/impedance
   4. Power.
4. Build electrical circuits from schematics using basic circuit components such as resistors, capacitors, inductors, transformers, relays and switches.
5. Identify and work with basic circuit components such as resistors, capacitors, inductors, transformers, relays and switches.
6. Apply and follow the safety procedures applicable to industrial electrical environments.

**Recommended Texts and Course Materials:**

***Text:***

Barish, G. (Ed.). (1998). *Basic Electrical Circuits*. Mundelein, Illinois: Energy Concepts.

***Materials:***

**Additional Course Requirements:** (N/A means this section does not apply to this course.)

N/A

**Recommended Methods of Instruction:**

The methods of instruction will include lecture, small group work, and laboratory projects.

**Recommended Methods of Evaluation:**

Midterm and final course grades will be based on the following assessments:

Attendance

Laboratory Exercises

Written Assignments

Problem Sets

Mid-term exam

Final exam

Grading Scale:

90-100% = A

80-89 = B

70-79 = C

60-69 = D

Below 60 = F

See the Policy on grade designations and grade appeals at:

<http://www.ccc.edu/colleges/daley/departments/Pages/Grade-Appeal-Policy-and-Procedure.aspx>

**NOTE:** Type or copy and paste the link above into a web browser to view its content.

### Topical Outline / Course Calendar:

1. Review concept of scientific notation as applied to electrical circuit parameters. Electrical safety and short circuit hazards. Electrical components and symbols.
2. Structure of matter, conductors and insulators, electrical quantities. Power Sources.
3. Circuits and Switches. Electrical Measurements.
4. Resistors and Ohm’s Law.
5. Series Resistive Circuits.
6. Parallel Resistive Circuits.
7. Test: Chapters 1 through 8-22. Compound Resistive Circuits.
8. Review Test. Compound Resistive Circuits.
9. Electrical Power and Energy.
10. Electrical Power and Energy. Magnetism and Electromagnetism.
11. Magnetism and Electromagnetism. Applications of Electromagnetism.
12. Alternating Current. Test: Chapters 8-23 through 12.
13. Inductance and Transformers.
14. Capacitance and Time Constants.
15. RLC Circuits, analysis and phase relationships.
16. Course Review and Final exam.

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