

**Fond du Lac Tribal and Community College**  
**COURSE OUTLINE FORM**

Updated 9/23/14

Please return this form to the college vice president of academic affairs and the chairperson of the Academic Affairs and Standards Council (AASC)

1. Prepared by: \_\_\_\_\_

2. Date submitted: \_\_\_\_\_

3. Date approved: \_\_\_\_\_ Date revised 09/23/14

4. Department/discipline: Electric Utility Technicians

5. Department(s) endorsement(s): \_\_\_\_\_

(Signatures of the person(s) providing the endorsement are required.)

6. Course Title: AC Electricity for Electric Utility Technicians

Abbreviated course title (25 characters or less): \_\_\_\_\_

7. Course Designator: EUT                      8. Course Level: 1021      9. 2XXX

10. Number of Credits: Lecture 2 Lab 1

11. Control Number (on site) 20                      Control Number (online) \_\_\_\_\_

12. Catalog/Course description:

This is the second half of a two-semester course. In this course students will be introduced to Alternating Current (AC) electric circuits and devices from the perspective used in the electric power industry. The topics of AC electric circuits, motors, generators, and other topics will be introduced through hands-on learning activities. (Prerequisite: EUT 1020 Basic Electricity).

13. Course prerequisite(s) or co-requisite(s): Accuplacer scores/ Other courses

Prerequisite(s): EUT 1020 Basic Electricity

Co-requisite:

14. **Course Materials** (Recommended course materials and resources. List all that apply, e.g. textbooks, workbooks, study guides, lab manuals, videos, guest lecturers).

Lab equipment consists of Heathkit AC Circuits training modules and LABVOLT electricity training modules, plus electricity multimeters.

*Electricity Principles and Application, by Richard Fowler*

15. **Course Content** (Provide an outline of major topics covered in course)

Review of Useful Mathematics Concepts

- Trigonometry and Waves
- Complex Numbers
- Vectors and Phase Angles

II. Alternating Current

- Generating AC
- The Sinusoidal and Non Sinusoidal Waveforms

- III. AC Measurements
  - AC Meters
  - Oscilloscopes
  - Power in AC circuits
  - Power Factor
- IV. Capacitive Circuits
  - Phase Shift
- V. Inductive Circuits
  - Phase Shift
- VI. Tuned Circuits
- VII. Transformers
- VIII. Motors
  - Squirrel-Cage Induction Motors
  - Synchronous Motors
  - Multiphase AC system
- IX. Reading Schematics
- X. Electric Power Safety Practices

**16. Learning Goals, Outcomes, and Assessment**

At FDLTCC we have 4 Competencies Across the Curriculum (CAC) areas. They are as follows:

- A. Information Literacy (the ability to use print and/or non-print tools effectively for the discovery, acquisition, and evaluation of information)
- B. Ability to Communicate (the ability to listen, read, comprehend, and/or deliver information in a variety of formats.)
- C. Problem Solving (the ability to conceptualize, apply, analyze, synthesize, and/or evaluate information to formulate and solve problems.)
- D. Culture (knowledge of Anishinaabe traditions and culture, knowledge of one's own traditions and culture, knowledge of others' traditions and cultures, culture of work, culture of academic disciplines and/or respect for global diversity.)

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

- 1. Proficient in AC electric circuits Ohms law, Power, and phase angle. (B, C)
- 2. Trouble shoot electrical problems with test instruments, DMM, Oscilloscope. (C)
- 3. Perform safety lockouts/tagouts with MCC's (A)
- 4. Use trigonometry to solve inductive and capacitive circuits. (A, C)
- 5. Calculate motor HP, Load, PF. (A)

**17. Minnesota Transfer Curriculum (MnTC):** If this course fulfills an MnTC goal area, state the goal area and list the goals and outcomes below:

See [www.mntransfer.org](http://www.mntransfer.org)

Goal Area(s): \_\_\_\_\_

Goal and Outcomes: