

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

12/11/12

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: 10/30/13 Date revised \_\_\_\_\_

4. Department/discipline: EUT

5. Department(s) endorsement(s): \_\_\_\_\_  
(Signatures of the person(s) providing the endorsement are required.)

6. Course Title: Sensors & Controls

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

7. Course Designator: EUT 8. Course Level: 1XXX 9. 2110

10. Number of Credits: Lecture 2 Lab 1

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

12. Catalog/Course description:

This course will provide students with the principles of measurement and control systems. The student will gain an understanding of different sensor technologies used to measure and detect physical properties used in a variety of electro mechanical, electro hydraulic and electro pneumatic systems. The student, through lab work, will also learn how to use and troubleshoot sensors used in open and closed loop control systems.

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

Prerequisite(s): EUT 1020 or electrical experience acceptable to the instructor.

Co-requisite: EUT 1021

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

Sensors and Devices text – to be determined.

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

1. Position Sensors
  - a. Limit switches – mechanical
  - b. Non-contact sensors
  - c. Absolute position sensors
2. Load cells
3. Pressure Sensors
4. Temperature sensors
5. Current Sensors
6. Flow Meters

- 7. Vibration Systems
- 8. Control
  - a. Open loop control
  - b. Closed loop control
  - c. Types of feedback
  - d. PID control
- 9. Positioners
  - a. Pneumatic
  - b. Electric
  - c. Stepper
  - d. Linear
- 10. Level Sensors

**16. Learning Goals, Outcomes, and Assessment** Minimum of one goal and two measurable learning outcomes in each competency. *If your course does not meet one of the Competencies Across the Curriculum, please justify your rationale.* Minimum of two assessment measures for each learning outcome. **Add other goals and outcomes as needed.** If this course is part of the Minnesota Transfer Curriculum (MTC), attach the MTC goals, outcomes, and your assessment measures to this form.

A. Information/Technology Literacy (the ability to use print and/or non-print tools effectively for the discovery, acquisition, and evaluation of information as well as core computer tools for the manipulation and presentation of information.)

I. Goal: Students will be technically proficient in electrical sensors.

- A. Outcome – The student will demonstrate competency in sensor technology
  - 1. Assessment: Quiz on devices
  - 2. Assessment: Verbal lab report on sensor technology
- B. Outcome – The student will demonstrate application of devices.
  - 1. Assessment: Lab application of device implementation
  - 2. Assessment: Homework showing different application methods.

B. Ability to Communicate (the ability to listen, read, comprehend, and/or deliver information in a variety of formats.)

I. Goal: The student will demonstrate competency in reading technical text, and communicating knowledge.

- A. Outcome - The student will complete and submit a lab report on hands-on lab experiments.
  - 1. Assessment: Lab reports will be graded.
  - 2. Assessment: Verbal review of lab work.
- B. Outcome - The student will participate in verbal homework report sessions.
  - 1. Assessment: Demonstrated via class participation in homework session.
  - 2. Assessment: Homework will be graded.

C. Problem Solving (the ability to conceptualize, apply, analyze, synthesize, and/or evaluate information to formulate and solve problems.)

I. Goal: The student will demonstrate the ability to recognize problems, troubleshoot, and apply solutions.

- A. Outcome - The student will demonstrate the ability to troubleshoot electrical problems.

- 1. Assessment: Labs will have a troubleshooting content involved with a success outcome requiring successful troubleshooting techniques to be employed.
- 2. Assessment: Lab report
- B. Outcome - The student will demonstrate the ability to solve complex electrical problems, using logic solutions.
  - 1. Assessment: Test
  - 2. Assessment: Quiz
- 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.)
- I. Goal: The student will become aware of traditions established by historical electrical methods.
  - A. Outcome - The student will be aware of traditional problem solving methods.
    - 1. Assessment: Test
    - 2. Assessment: Quiz
  - B. Outcome - The student will be exposed to the safety culture developed in the electrical trades.
    - 1. Assessment: Class review
    - 2. Assessment: Demonstration of safety culture during Lab sessions.
- E. Other

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: