

**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: 4/22/2011                      Date revised: 9/23/2014
4. **Department/discipline:** Electric Utility Technicians
5. **Department(s) endorsement(s):** \_\_\_\_\_  
(Signatures of the person(s) providing the endorsement are required.)
6. Course Title: Programmable Logic Controllers  
Abbreviated course title (25 characters or less):
7. Course Designator: EUT
8. Course Level: 1100
9. Number of Credits: Lecture: 2 Lab: 1
10. Control Number (on site): 20  
Control Number (online): 0
11. Catalog/Course description:  
  
In this course, the student will learn the basics of programmable logic controllers. They will learn the fundamentals of how PLCs operate and how to program them to perform simple control functions. The student will learn Ladder Logic programming using the Allen Bradley Control Logics software or equivalent, and interface input and output devices.
12. Course prerequisite(s) or co-requisite(s):  
Prerequisite(s): EUT 1020 Basic Electricity or Electrical experience and instructor approval  
Co-requisite: None
13. Course Materials (Recommended course materials and resources. List all that apply, e.g. textbooks, workbooks, study guides, lab manuals, videos, guest lecturers).  
  
1. Programmable Logic Controllers, Software – Allen Bradly Prologic or

equivalent.

2. Texts to be determined yearly on the basis of content and availability, and will be on the syllabus.

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

1. Review of PLC history.
2. PLC construction and design elements.
3. Ladder logic programming.
  - a. Seal in circuits
  - b. Timers
  - c. Counters
  - d. Complex circuits
4. PLC file structure, operating modes, downloads
5. Input and Output card usage.
  - a. Discrete I/O
  - b. Analog I/O
  - c. Smart cards
6. PLC safety practices.

**15. 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.)

*Course learning outcomes will fulfill the identified competencies:*

*Course Learning Outcomes:*

Upon completion of this course, students will be able to:

1. Install a PLC and in and output (I/O) and communicate to the processor. (A,C)

2. Program a start stop motor circuit in the PLC. (C)
3. Wire input s into the I/O and address correctly (A,C)
4. Wire output devices to the I/O and activate. (C)
5. Use timers and counters in logic programming. (C)
6. Use both analog and digital outputs. (C)

16. **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): N/A

Goal and Outcomes:

Goal: N/A

Outcome:

**Complete the following only if you are proposing a new course:**

1. Planned pattern of offering:
2. Rationale for course: If this course is an ADDITION or replacement to current offerings, add a detailed explanation of the necessity for the change.
3. Does this course overlap with any course(s) offered at FDLTCC? If so, justify such duplication or indicate other adjustments to be made. Obtain signatures from affected departments.
4. What is the apparent or expressed student need for this course?
5. If this course includes a Native American or specifically Anishinaabe component list campus resource person/s—i.e., campus cultural/spiritual resource person/s and, if necessary, elder/s—consulted and include specific comments and written responses as appropriate.
6. Are there any additional licensing/certification requirements involved?
  - a. Provide a copy of the required licensing/certification standards to the AASC chair and to the vice president of academic affairs.
  - b. Attach the required documentation to show course meets required licensing/certification standards.
7. What types of tutoring will be made available through the CAA to students taking this course?
8. How will the course be evaluated?
9. Special resources—e.g. faculty, space, equipment, library, etc
10. Special course fees:
11. Relationship of course to the college mission statement and goals.
12. Relationship of course to the department’s mission statement and goals.
13. Relationship of course to colleges/university offerings (include tribal colleges).

<b>College or University</b>	<b>Course Number &amp; Title</b>	<b>Credits Awarded</b>	<b>General Education</b>	<b>Program</b>
Hibbing CC				
Itasca CC				
Mesabi CC				
Lake Superior				
Leech Lake				
LCO CC				
Bemidji State University				
College of St. Scholastica				
University of Minnesota - Duluth				
University of Wisconsin - Superior				
Other Tribal College				

<b>College or University</b>	<b>Course Number &amp; Title</b>	<b>Credits Awarded</b>	<b>General Education</b>	<b>Program</b>
MEsOther				