

## Clackamas Community College

### Online Course/Outline Submission System

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#### Section #1 General Course Information

**Department:** Manufacturing

**Submitter**

First Name: William (Doug)

Last Name: Miller

Phone: 5132

Email: dougm

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**Course Prefix and Number:** **IMT - 233**

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**# Credits:** 3

**Contact hours**

Lecture (# of hours): 33

Lec/lab (# of hours):

Lab (# of hours):

Total course hours: 33

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

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**Course Title:** **Programmable Logic Controllers I**

**Course Description:**

Study of basic skills necessary to program, install and maintain industrial control systems utilizing programmable logic controllers. Course content lays a foundation of hardwired relay control systems and components, and then builds on this for an understanding of programmable logic controller (PLC) systems.

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**Type of Course:** Career Technical Supplementary

Can this course be repeated for credit in a degree?

**No**

What is the target audience/industry for this class?

CAM, Electronics, Semiconductor Manufacturing and Renewable Energy

Are there prerequisites to this course?

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**Yes**

**Recommendations:** Completion of MFG-130

**Requirements:** None

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**Yes**

Have you talked with a librarian regarding that impact?

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

GRADING METHOD:

A-F or Pass/No Pass

**Audit: Yes**

When do you plan to offer this course?

✓ **Spring**

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**No**

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

**Student Learning Outcomes:**

Upon successful completion of this course, students should be able to:

1. summarize the basic overview of PLC's and their functionality,
2. diagram basic PLC hardware scheme,
3. summarize Logic Gates and their relationship to PLC programming including AND, OR, NOT, EXOR, etc;
4. use and understand timers and counters, along with their use in specific applications;
5. diagram and program basic PLC diagrams,
6. develop a PLC program from a given problem statement to a documented and working program,
7. utilize troubleshooting skills to clarify and solve problem.

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***This course does not include assessable General Education outcomes.***

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**Major Topic Outline:**

1. Overview of Programmable Logic Controllers.
2. Number Schemes i.e. Binary, Octal, Hexadecimal.
3. Logic Fundamentals i.e. AND, OR, NOT, EXOR Logic Gates.
4. Basics of PLC Programming.
5. Development of Fundamental PLC Wiring and Ladder Logic Programs.
6. Programming and Implementing Timers.
7. Programming and Implementing Counters.
8. Troubleshooting Techniques for Programming and I/O devices.

**Does the content of this class relate to job skills in any of the following areas:**

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course: 0%

**First term to be offered:**

**Specify term: 2017/SP**

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