

# NorthCentral

## MISSOURI COLLEGE

### SYLLABUS

### PROGRAMMABLE LOGIC CONTROLLERS

#### Fall Semester 2015

**Course Number:** MF141: Programmable Logic Controllers

**Instructor Information:**

**Name:** Cory Cooksey  
**Phone:** 660-359-3948 ext. 1319  
**Office:** Hoffman Hall 102  
**Email:** ccooksey@mail.ncmissouri.edu

**Office Hours:**

**MWF: 11:30 - 12:30, TR: 11:00 - 12:20 and 1:30 - 4:00**

**Course Description:**

This course provides students the basic knowledge of Programmable Logic Controllers (PLC's) and their application in industry today. This is a hands-on study of PLC programming applications such as sequencing, timers, counters, hydraulic and pneumatic actuators, indicator lamps and motor controls. At the completion of the course, students will be able to program and troubleshoot a PLC for typical industry applications (using Allen-Bradley Control Logix software). (lab fee)

**Prerequisites:** None

**Credit Hours:** 3 credit hours

**Textbook and /or Supplementary Materials:**

- Amatrol printed A-B PLC curriculum
- Interactive On-line Amatrol Multimedia Application (Student internet access for outside-of-class assignments is expected)

**Student Learning Objectives:**

<b>Student Learning Objective</b>	<b>Assessment Method</b>
Upon successful completion of this course the student will be able to:	Describe the assessment tool/s used to demonstrate each student learning outcome.
1. describe the basic operation of PLC ladder logic.	Lessons 1 and 2 Quizzes and Labs
2. generate and print a ladder logic report using PLC software.	Lessons 2 and 7 Quizzes and Labs
3. design a PLC program to control various machine functions.	Lessons 3 and 4 Quizzes and Labs
4. troubleshoot a PLC-controlled electric motor system.	Lesson 5 Quiz and Lab

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5. design a continuous cycle sequence PLC program.	Lesson 6 Quiz and Lab
6. design a PLC program that uses subroutines.	Lessons 7 and 10 Quizzes and Labs
7. design a PLC program that displays messages about the status of a process.	Lessons 10 and 11 Quizzes and Labs

**Course Outline/Major Topics Studied:**

- Intro to Programmable Controllers
- Basic PLC Programming
- PLC Motor Control
- Discrete I/O Interfacing
- PLC Systems Troubleshooting
- Event Sequencing
- Application Development
- PLC Timer Instructions
- PLC Counter Instructions
- Program Control Instructions
- Math and Data Move Instructions

**Instructional Methods and Techniques:**

- |                         |                                   |
|-------------------------|-----------------------------------|
| 1. Lecture              | 4. Individual/group work          |
| 2. Class discussion     | 5. Learner presentation           |
| 3. Amatrol On-line Labs | 6. Guest speakers from profession |

**Course Requirements:**

- Class Participation and Skills Demonstrations (10%)
- Amatrol LAP Quizzes – up to 14 (60%) – Closed book, hand-written notes allowed.
- Final Exam – (30%) – Closed book, hand-written notes allowed.

**Grading Scale:**

Semester grades will be determined by dividing the total points earned by the total points possible. Letter grades given will be according to the following scale:

- A --- 90% & above
- B --- 80% - 89%
- C --- 70% - 79%
- D --- 60% - 69%
- F --- Below 60%

**Attendance and Class Participation:**

Absences reduce the value of the learning experience and reduce the probability of passing the course as research indicates successful college students attend class regularly. NCMC strongly encourages students to attend classes on a regular basis as registration for any NCMC course

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presupposes that the student will attend all scheduled classes, laboratories, and clinicals. **Failure to attend class does not constitute an official standard withdrawal.** Students are responsible for withdrawing from classes. If a student knows they are going to be absent for a college-sponsored event, they must inform the instructor prior to that absence so that arrangements can be made for classwork, assignments, and/or tests.

After the published Add/Drop date, students are financially responsible for costs associated with classes from which they have withdrawn. Students are also financially responsible for the course under the Administrative Drop Policy.

Administrative Drop Policy:

- In an 8-week or full semester on-ground class, if a student fails to attend during the **first ten calendar days** of the semester, an administrative drop will occur. In a 4-week class, if a student fails to attend during the **first six calendar days** of the semester, an administrative drop will occur.
- In an 8-week or full-semester online class, if a student does not complete at least one substantive activity (activity or assignment that impacts the final grade) during the **first ten calendar days** of the semester, an administrative drop will occur. In a 4-week online class, if a student fails to complete at least one substantive activity (activity or assignment that impacts the final grade) during the **first six calendar days** of the semester, an administrative drop will occur.
- Under these circumstances, students are financially responsible for 50% of tuition and course fees associated with classes from which they have been administratively dropped.

#### **Additional Information:**

- Students enrolled in this course are expected to :
  - attend class
  - be on time
  - participate in class discussions
  - read assigned text/materials
  - complete written assignments/projects
  - act in a professional and respectful manner

#### **Academic Misconduct**

Academic integrity is expected and required of all NCMC students. Students and faculty are responsible and accountable for personally upholding that integrity. Each instructor is assigned jurisdiction for class conduct and grades. Cheating will not be tolerated, and students found guilty of cheating in any way will be disciplined according to the following policy.

#### **Cheating Offenses**

Cheating offenses include, but are not limited to, the following:

- Copying from another student in an examination situation.
- Using unauthorized material or aids in the preparation of an assignment, paper or project.
- Possessing unauthorized material or aids in an examination situation.

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- Allowing another person to take an examination in one's place.
- Altering or falsifying academic records in any way.
- Submitting false medical, academic or other documentation required by the college.
- Improperly obtaining an examination prior to the examination.
- Aiding or abetting anyone in a cheating offense.
- Plagiarizing materials or works, in whole or in part, prepared by another person without citing appropriate reference credit.
- Copying and submitting, in whole or in part, the work of another in an assignment, report, paper, project, etc. as one's own.
- Claiming to have completed assigned tasks that were, in fact, completed by another person.
- Failing to accurately document information, wording, or visual images obtained on the World Wide Web.
- Violating federal copyright laws including unauthorized duplication of copyrighted materials.

### **Procedure**

1. When a student is suspected of cheating, the instructor or other individual who suspects the student of cheating will, at the earliest opportunity, investigate the situation, discuss the matter with the student and come to a decision regarding the student's innocence.
2. In the event a decision is made that the student is responsible of cheating, before determining an appropriate penalty, the course instructor will ascertain from the Dean of Instruction whether the student has been found responsible of any previous cheating offense while enrolled at North Central Missouri College.
3. In the event that the instructor determines this to be a first offense for the student, the instructor will apply an appropriate penalty. The instructor should give due consideration to the seriousness of the offense as well as the impact of the penalty imposed on the student's education. The penalty should also be consistent with the range of penalties outlined in this policy.
4. The instructor will inform the Dean of Instruction of the cheating offense and the penalty applied.
5. In the case of a second offense by the student, the Dean of Instruction will determine the appropriate penalty for this offense and will ensure that the penalty is more severe than the penalty imposed for the previous offense. The student will be advised that if found responsible of a third offense of academic dishonesty at North Central Missouri College, the penalty of expulsion from the College could result.

### **Penalties**

A student responsible of cheating will be subject to a penalty appropriate to the nature and seriousness of the offense.

A record of all such cases will be kept in the office of the Dean of Instruction. Second offenses for the same individual will be subject to a more serious penalty than the one previously imposed.

The following penalties may be applied:

- Reprimand.

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- Requirement that the student repeats and re-submits the same or alternate assignment. In such cases, the grade or mark awarded will be reduced or limited at the discretion of the faculty member.
- A mark of "0" will be given for the assignment with no opportunity to resubmit. This may result in failure of the course.
- A failing (F) grade will be awarded in the course.
- Automatic failing (F) grades in all courses in which the student is registered, and no tuition or fees will be refunded for that semester. This penalty will only be imposed by the Dean of Instruction.
- Expulsion from North Central Missouri College, permanently recorded on the student's record. This penalty will result in automatic failing (F) grades in all courses in which the student is registered, and no fees will be refunded for that semester

### **Special Accommodations:**

North Central Missouri College complies with Section 504 of the Rehabilitation Act of 1973 and the American with Disabilities Act of 1990. Students with documented disabilities who need special classroom accommodations must make their requests in writing to: Disability Support Services, Alexander Student Center, 1301 Main Street, Trenton, MO 64683 or call 660-359-3948, ext. 1405 for an appointment. Services provided can be found at:

[http://www.ncmissouri.edu/services/disability\\_services/default.aspx](http://www.ncmissouri.edu/services/disability_services/default.aspx)

If you have been approved for an accommodation, if you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please inform me immediately.

### **Early Alert:**

Success in this course is important. When the instructor believes that a referral to the Early Alert Program will help a student academically, information will be sent to appropriate college personnel. As a result, the student may be contacted by other faculty/staff in order to develop an intervention that will help in achieving educational goals. Please take advantage of these and other resources while at NCMC.

### **Communications:**

Students are required to use their NCMC student email account for any correspondence within the college. Students are also highly advised to check their email and SAIL accounts on a regular basis.

### **Finals:**

If an emergency occurs that prevents the administration of a final examination, the student's final course grade will be calculated based on the work in the course completed to that point in time and the faculty member's considered judgment. Final exams will not be rescheduled, and a grade of "I" will not be given as a result of the missed exam. This Finals policy does NOT apply to online courses.

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