**Oakton Community College**

**Advance PLC/Automation Applications**

**I.     Course Prefix/Number:** MFG 250

**Course Name:** Advance PLC/Automation Applications

**Credits:** 4 (3 lecture; 3 lab)

**II.    Prerequisite**

MFG 240

**III.   Course (Catalog) Description**

This course will continue the development of an understanding of machine automation and control systems design using Programmable Controllers and HMI devices. Allen Bradley controllers will be covered in depth as well as Panel View terminals. The SLC 500 controller will be used in all labs for this course. Students will begin with an introduction to HMI interfaces using the Panel View software and hardware. The student will then work with the PLC and HMI software packages to build a complete working machine control system.

**IV.   Learning Objectives**

Students will learn I/O interfacing between the PLC controller and HMI devices. Once the HMI design process is complete and understood, students will be instructed in how to write ladder logic programs to control several real machines in the lab. In addition the student will be instructed in writing diagnostic programs to monitor the machines operation and display the errors on the HMI screen.

**V.    Academic Integrity**

Students and employees at Oakton Community College are required to demonstrate academic integrity and follow Oakton's Code of Academic Conduct. This code prohibits:  
  
• cheating,   
• plagiarism (turning in work not written by you, or lacking proper citation),   
• falsification and fabrication (lying or distorting the truth),   
• helping others to cheat,   
• unauthorized changes on official documents,   
• pretending to be someone else or having someone else pretend to be you,   
• making or accepting bribes, special favors, or threats, and   
• any other behavior that violates academic integrity.   
  
There are serious consequences to violations of the academic integrity policy. Oakton's policies and procedures provide students a fair hearing if a complaint is made against you. If you are found to have violated the policy, the minimum penalty is failure on the assignment and, a disciplinary record will be established and kept on file in the office of the Vice President for Student Affairs for a period of 3 years.   
Details of the Code of Academic Conduct can be found in the Student Handbook.

**VI.   Sequence of Topics**

Class #1:  
Introduction to HMI programming software, tag lists, push button assignment, indicator windows and interfacing techniques between the PLC and HMI devices.   
  
Class #2:  
LAB project to complete the HMI interface design to work with lab 10 from the previous class. In the project the student must operate the previous lab functions through the HMI interface as well as provide diagnostic error messages that will be displayed on the HMI device.  
  
Class #3:  
Continuation of the LAB project started in class 2.  
  
Class #4:  
Introduction to the HIRATA board testing machine located in the back of the lab. Discussion on how the machine functions, I/O list and how to design the HMI interface to it. Finish up the lab previously started.   
  
Class #5:  
Introduction to the Tech Track assembly system located in the lab. Discussion on how the machine is to function, I/O list and how the HMI interface should be designed to operate it.  
  
Class #6:  
First test.   
All students will be broken up into lab groups and assigned to work on one of the 2 machines located in the lab area. (HIRATA or Tek Track) These will be complete machine design programs and will take several weeks to complete. The instructor will be available during the next class secessions for consultation and advice on how to program and debug these control programs. When a group finishes their program, and the program is signed off by the instructor, they can begin to work on a program to control the other machine.   
  
Class #7: Lab project consultation and coaching.  
Class #8: Lab project consultation and coaching.  
Class #9: Lab project consultation and coaching.  
Class #10: Lab project consultation and coaching.  
Class #11: Lab project consultation and coaching.  
Class #12: Lab project consultation and coaching.  
Class #13: Lab project consultation and coaching.  
Class #14: Lab project consultation and coaching.  
  
Class #15:  
Final test and all lab projects due for completions.  
  
The instructor reserves the right to make adjustments to the above schedule by informing the class accordingly.

**VII.  Methods of Instruction**

Classroom discussions, handout materials, lab projects.  
Course may be taught as face-to-face, media-based, hybrid or online course.

**VIII. Course Practices Required**

Handouts: Sample programs and Student Lab Manuals.  
Lab projects.

**IX.   Instructional Materials**

**Note:** Current textbook information for each course and section is available on Oakton's Schedule of Classes.  
  
Programmable Controllers using the Allen Bradley SLC 500 Family.  
Author : David Geller  
ISBN: 0-13-096208-2

**X.    Methods of Evaluating Student Progress**

2 tests will be given as shown on the topic outline.  
3 lab projects must be completed for a perfect lab grade of 100.  
The 2 test grades will be averaged with the lab grade for a final grade.

**XI.   Other Course Information**

If you have a documented learning, psychological, or physical disability you may be entitled to reasonable academic accommodations or services. To request accommodations or services, contact the Access and Disability Resource Center at the Des Plaines or Skokie campus. All students are expected to fulfill essential course requirements. The College will not waive any essential skill or requirement of a course or degree program.

**XII. Instructor:**

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