

NEWARK COLLEGE OF ENGINEERING

SYLLABUS AND COURSE INFORMATION

- Course Name:** Computerized Industrial Controls
- Course Number:** ECET 350
- Course Structure:** 2-2-3 (lecture hr/wk – lab hr/wk – course credits)
- Course Description:** This course introduces students to the theory and application of computerized control systems and technologies used in industry today. The course focuses on the hands-on development and integration of programmable logic controllers (PLCs), motor controllers (drives), and supervisory software.
- Prerequisites:** CPT 315 and ECET 311
- Corequisites:** None
- Required, Elective, or Selected Elective:** Elective
- Required Materials:** **Text:** Name: Programmable Logic Controllers
Author: James A. Rehg and Glenn J. Sartori
Year: 2008
ISBN: 978-0-13-504881-8
- Course Outcomes:** By the end of the course students are able to:
1. Understand and read basic ladder logic diagrams and relate such to basic digital logic symbols and state diagrams.
 2. Develop, program, implement and test ladder logic programs in industrial applications.
 3. Understand basic motor control and automation theory, including both digital and analog applications
 4. Convert ladder logic to its Boolean equivalent and use Boolean techniques to simplify and analyze complex ladder logic programs
 5. Understand the use and application of specialized PLC functions such as counters, timers, specialized relays, high speed counters, latches and arithmetic functions.
 6. Demonstrate the ability to create structured programs utilizing conventional methods of labeling, describing and documenting programs.
 7. Analyze, design and configure PLC programs to run rudimentary automation applications.
 8. Understand the operation the various file types and practice using each in program development.
 9. Understand the concepts of memory allocation, memory addressing and memory access in a PLC system.
 10. Differentiate between and design programs that minimize memory or scan times.

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11. Calculate theoretical scan times and understand their effect on system operation.
12. Understand the various hardware configurations and troubleshoot both hardware and software in a simulated industrial environment.

Class Topics: Ladder Logic Motor Control
Automation Theory Counters & Timers
PLCs Troubleshooting
Relays Sensors

Student Outcomes: The Course Learning Outcomes support achievement of the following Student Outcomes from the ETAC of ABET Criterion 3 requirements.

Student Outcome f: An ability to identify, analyze, and solve broadly-defined engineering technology problems.

Related Course Learning Outcomes: 1, 3, 5, 8, 9, & 12

Student Outcome i: The application of circuit analysis and design, computer programming, associated software, analog and digital electronics, and microcomputers, and engineering standards to the building, testing, operation, and maintenance of electrical/electronic(s) systems.

Related Course Learning Outcomes: 2, 6, & 12

Academic Integrity: NJIT has a zero-tolerance policy regarding cheating of any kind and student behavior that is disruptive to a learning environment. Any incidents will be immediately reported to the Dean of Students. Please visit the Dean of Students website at <http://www.njit.edu/doss> for a list of student policies relating to academic integrity and student conduct.

Modification to Course: The Course Outline may be modified at the discretion of the instructor or in the event of extenuating circumstances. Students will be notified in class of any changes to the Course Outline.

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