

EEAS 221 – Industrial Circuits: Basic Programmable Logic Controllers

FALL 2010

INSTRUCTOR: J. Koepke, P.E.
OFFICE: T1068
PHONE: (815) 280-2611
E-MAIL: jkoepke@jjc.edu

PREREQUISITE: EEAS 113 or consent of the EEAS advisor

TEXT: Fundamentals of Programmable Logic Controllers, Sensors and Communications, Stenerson, 3rd ed.
(RECOMMENDED)

SOFTWARE: LogixPro PLC simulator, The Learning Pit

**COURSE
DESCRIPTION:**

This course deals with the basic operation, application and programming of an integrated industrial control system, concentrating on the industrial microprocessor programmable logic controller (PLC). The course covers uses of PLCs, product ranges, benefits numbering systems and codes and logic concepts pertaining to PLCs. The student will develop an understanding of the PLC central processing unit, input-output systems, programming and peripheral devices, and programming languages. Additionally, the student will develop skills in programming and documentation procedures.

TESTS: Tests will cover material presented during lectures, discussions, homework and labs as well as selected information from the textbook.

QUIZZES: Quizzes will cover lecture material, homework assignments and lab material presented in the associated lesson. Each lesson and lab will have a quiz to complete. Quizzes must be completed in the allowed time frame. (No make-up quizzes)

HOMEWORK: Homework will cover subject material from the previous lecture; students shall be prepared to discuss the solutions in class.

ATTENDANCE: **Making up missed work:** Attendance is essential to learning, if you must miss class, get the assignments, handouts, and lecture notes from Angel. Do not expect the instructor to give them to you at the next session. Due dates are not extended except (rarely) by specific permission from the instructor.

Make up testing is allowed at **instructor's discretion** and convenience, but you **must** notify in **advance** if you will miss a test or quiz; otherwise, typically, no make-up will be given.

Excused absence: Examples of excused absence: Serious illness or injury, death in the family, car failure, court appearance, JJC field trip, mandatory overtime, and traffic accidents. Prolonged or repeated absence, even for acceptable reasons, will prevent you from learning the material.

DROP/WITHDRAW: At any time prior to the deadline dates established, an instructor may withdraw a student from class because of poor attendance, poor academic performance, inappropriate academic behavior such as, but not limited to, cheating or plagiarism, disregard for safety rules or for improper conduct. (See the College Catalog)

If you decide to drop due to excessive absences or other reasons, be sure you do the withdrawal paperwork before the last drop date. **Do not** simply stop coming to class. It is the student's responsibility to drop the course or to withdraw from the college. Failure to drop will result in a performance grade such as an "F." Contact the Registrar's Office for further information on withdrawal procedures.

SCHOOL POLICIES: Students are responsible for knowing and following the terms and conditions of Joliet Junior College Policies for **Angel** use, e-mail accounts and general classroom conduct. These policies and others may be found in the college catalog and student handbook, at the student kiosks, or online at www.jjc.edu.

CONDUCT: This class will operate under the guidelines presented in the current college catalog in reference to sexual harassment, academic misconduct and plagiarism. Professional standards of dress, courtesy, ethics, speech, and behavior are expected at all times. Bad conduct will result in disciplinary action, which may include dismissal. Especially, **academic misconduct** (plagiarism, cheating, copying) will not be tolerated. Committing some form of academic misconduct will lead to a zero on the test, quiz or homework in question. See the student handbook for more information.

SEXUAL HARASSMENT: The College has a clear and firm policy prohibiting sexual harassment. Such conduct will **not** be tolerated in this class, and victims are encouraged to report any unwelcome sexual advances to appropriate school authorities. (See college catalog and/or student handbook) Learning is best achieved in an environment of mutual respect and trust.

**TECHNICAL
ASSISTANCE:**

For technical problems related to the use of Angel, you should check the 24/7 Support Center website at www.jjc.edu/help where you may find a solution to your problem. Technicians are also available by phone 24 hours a day 7 days a week 365 days a year to answer your Angel related questions at 866-361-8864.

**ACADEMIC
ASSISTANCE:**

Students may wish to utilize the many services offered by the Academic Skills Center (J2013-Main Campus). Some students, for example, may schedule appointments with tutors in the ASC, who are available at no cost to provide assistance. Conferences may also be arranged with the instructor during office hours or by special appointment.

Academic Skills Center

Main Campus: J-2013

Phone: (815) 280-2261 or (815) 280-2284

Email: lkolesar@jjc.edu

Hours: (check for time changes)

Monday – Thursday: 7:30am – 7:30pm

Friday: 7:30am – 4:30pm

Saturday: closed

SPECIAL NEEDS:

Students with documented disabilities, including a learning disability, who require special accommodations, should identify themselves during the first few weeks of the semester. Please contact me privately at your earliest convenience so that we may discuss your special needs.

Student Accommodations and Resources

Main Campus: J-2025

Karen Strysik

Administrative Assistant

Phone: (815) 280-2230

Fax: (815) 280-2820

Email: kstrysik@jjc.edu

Hours: (check for time changes)

Monday – Friday: 7:30am – 4:00pm

CELLPHONES:

Please turn them off.

COMPUTER USE:

Students are encouraged to use the lab systems for email and internet research etc. subject to school policy (see student handbook).

**ANGEL
SOFTWARE:**

We will be using the Angel classroom support software this semester. You can access this via the internet from your home or workplace. You will find announcements, course documents, assignments, quizzes, tests and other information posted there. **Also check your campus email account**, which was created automatically when you registered for classes.

EVALUATION: Estimated percentage of final grade; may be adjusted by instructor-

Labs	20%
Homework/ Quizzes	20%
Mid-Term Exam	30%
Final Project or Exam	30%

GRADING SCALE (%): Estimated percentage range-

92 to 100	A
84 to 91	B
76 to 83	C
65 to 75	D
Below 65	F

CANCELLATION: When classes are cancelled due to weather conditions, the college will post this information on its website: www.jjc.edu or will notify area radio and television stations (see the Course Catalog).

FALL 2010:

Sep 6	Labor Day (H)
Nov 11	Veterans Day (H)
Nov 24	Fall Recess (H)
Nov 25 - 28	Thanksgiving (H)
Dec 13 - 17	Final Exams

EEAS 221 Course Outline

Lesson	Text Section	Topic
1	Chapter 2	Overview of the Programmable Logic Controller (PLC)
2	Chapters 1, 3 and 4 Class Notes	Electrical Safety, Fundamentals of Logic, Binary Number System
3	Chapters 2, 3, 4 and 5 Class Notes	Programmable Logic Controller Hardware Components, Octal and Hexadecimal Number systems
4	Chapter 2, 5 and 6 Class Notes	Interfacing I/O Devices, Binary-Coded Decimal (BCD), Gray Code, ASCII Code
5	Chapter 5 and 11 Class Notes	Program Control Instructions, Industrial Sensors
6	Chapter 7 Class Notes	Programming Timers
7	Chapter 7 Class Notes	Programming Counters
8	Chapter 8 Class Notes	Binary Arithmetic, Math Instructions
9	Chapter 9 Class Notes	Masking
10	Chapter 9 Class Notes	Sequencer Instruction
11	Chapter 23 Class Notes	PLC System Troubleshooting
12	Chapter 6 Class Notes	Introduction to Analog Inputs