

## Industrial Engineering Program

<b>1. COURSE NUMBER AND NAME</b>	<b>IE 455 – Robotics and Programmable Logic Controllers</b>
<b>2. CREDITS AND CONTACT HOURS</b>	3 Credits. 4 Contact Hours
<b>3. COURSE INSTRUCTOR</b>	Kevin McDermott
<b>4. TEXT BOOK</b>	Webb, John, Programmable Logic Controllers, 4 <sup>th</sup> Ed., Prentice Hall, Upper Saddle River, NJ.
<b>4A. OTHER MATERIAL</b>	Equipment manuals
<b>5A. CATALOG DESCRIPTION</b>	Introduction to the design and implementation of programmable logic controllers for use in industry in the areas of automotive assembly, pharmaceutical manufacturers, the chemical industry, and others. Includes ladder logic, input/output ports, continuous process control, timing and counting functions, chaining sequences, and digital gate logic.
<b>5B. PREREQUISITES</b>	Junior or senior standing
<b>5C. REQUIRED, ELECTIVE OR SELECTED ELECTIVE</b>	Elective
<b>6A. SPECIFIC OUTCOMES OF INSTRUCTION</b>	The students will: 1 Learn how to develop and design PLCs (k) 2 Learn to program in ladder logic (a, k). 3 Be able to do design and develop in groups and individually PLC-based work cells (a, b, d, k).
<b>6B. CRITERION 3 OUTCOMES ADDRESSED</b>	The mapping of the three (3) outcomes of instruction of item 6A to the Criterion 3 outcomes (a-k) is as follows: 1. Satisfies Criterion 3 outcome k. 2. Satisfies Criterion 3 outcomes a and k. 3. Satisfies Criterion 3 outcomes a, b, d and k.
<b>7. TOPICS COVERED</b>	<ol style="list-style-type: none"> <li>1. Programmable Logic Controllers in industry</li> <li>2. PLC memory, CPU interfaces</li> <li>3. Boolean algebra, PLC logic</li> <li>4. PLC programming procedures</li> <li>5. Programing input and output ports</li> <li>6. PLC robotic controllers</li> <li>7. Creating ladder diagrams from process control</li> <li>8. PLC timer functions</li> <li>9. PLC counter functions</li> <li>10. PLC arithmetic functions</li> <li>11. PLC number comparison functions</li> </ol>

	12. Analog PLC operations 13. Networking PLCs
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