

AUTOMATION AND ROBOTICS

*Effective Term – Fall 2007 [2007*03] – CRC 09/20/06*

ATR 111	Automation Systems	2	3	3
Prerequisites:	None			
Corequisites:	None			

This course introduces automation in today’s industrial environment and provides an overview of the many different elements which form an automation system. Topics include hydraulics/pneumatics, sensors/transducers, electronic motor controls, input/output interfaces between PLCs/sensors/transducers, and analysis of malfunctions based on measurements, physical symptoms, operating history, and observations. Upon completion, students should be able to understand the operation of various elements in an automation system.

*Effective Tern – Summer 1997 [1997*02]*

ATR 111	Modern Automation Systems	2	3	3
Prerequisites:	ELC 128			
Corequisites:	None			

This course introduces automation in today’s industrial environment and provides an overview of the many different elements which form an automation system. Topics include hydraulics/pneumatics, sensors/transducers, electronic motor controls, input/output interfaces between PLCs and sensors/transducers, and analysis of malfunctions based on measurements, physical symptoms, operating history, and observations. Upon completion, students should be able to understand the operation of various elements in an automation system.

*Effective Tern – Summer 1997 [1997*02]*

ATR 112	Intro to Automation	2	3	3
Prerequisites:	None			
Corequisites:	None			

This course introduces the basic principles of automated manufacturing and describes the tasks that technicians perform on the job. Topics include the history, development, and current applications of robots and automated systems including their configuration, operation, components, and controls. Upon completion, students should be able to understand the basic concepts of automation and robotic systems.

*Effective Term – Fall 1998 [1998*03]*

ATR 211	Robot Programming	2	3	3
Prerequisites:	None			
Corequisites:	None			

This course provides the operational characteristics of industrial robots and programming in their respective languages. Topics include robot programming utilizing teach pendants, PLCs, and personal computers; and the interaction of external sensors, machine vision, network systems, and other related devices. Upon completion, students should be able to program and demonstrate the operation of various robots.

		Class	Lab	Credit
<i>Effective Term – Summer 1997 [1997*02]</i>				
ATR 211	Robot Programming	2	3	3
Prerequisites:	CIS 110 or CIS 111			
Corequisites:	None			

This course provides the operational characteristics of industrial robots and programming in their respective languages. Topics include robot programming utilizing teach pendants, PLCs, and personal computers; and the interaction of external sensors, machine vision, network systems, and other related devices. Upon completion, students should be able to program and demonstrate the operation of various robots.

<i>Effective Term – Fall 2007 [2007*03] – CRC 09/20/06</i>				
ATR 212	Industrial Robots	2	3	3
Prerequisites:	None			
Corequisites:	None			

This course covers the operation of advanced industrial robots. Topics include the classification of robots, activators, grippers, work envelopes, computer interfaces, overlapping work envelopes, installation, and programming. Upon completion, students should be able to install, program, and troubleshoot industrial robots.

<i>Effective Term – Summer 1997 [1997*02]</i>				
ATR 212	Industrial Robots	2	3	3
Prerequisites:	ATR 211			
Corequisites:	None			

This course covers the operation of advanced industrial robots. Topics include the classification of robots, activators, grippers, work envelopes, computer interfaces, overlapping work envelopes, installation, and programming. Upon completion, students should be able to install, program, and troubleshoot industrial robots.

<i>End Term - Summer 2008 [2008*02] - CRC 09/20/06</i>				
<i>Effective Term – Summer 1997 [1997*02]</i>				
ATR 213	Programmable Controllers	3	3	4
Prerequisites:	ELC 131			
Corequisites:	None			

This course provides a detailed study of the PLC, related hardware and programming format, and applications in the automated work cell. Topics include input/output modules, power supplies, operator interface, ladder logic, and Boolean language programming. Upon completion, students should be able to install, program, and maintain PLC-controlled systems.

<i>Effective Term – Fall 2007 [2007*03] – CRC 09/20/06</i>				
ATR 214	Advanced PLCs	3	3	4
Prerequisites:	None			
Corequisites:	None			

This course introduces the study of high-level programming languages and advanced I/O modules. Topics include advanced programming languages; system networking; computer interfacing; analog and other intelligent I/O modules; and system troubleshooting. Upon completion, students should be able to write and troubleshoot systems using high-level languages and complex I/O modules.

*Effective Term – Summer 1997 [1997*02]*

ATR 214	Advanced PLCs	3	3	4
Prerequisites:	ATR 213			
Corequisites:	None			

This course introduces the study of high-level programming languages and advanced I/O modules. Topics include STATEMENT, GRAFCET, or other advanced programming languages; system networking; computer interfacing; analog and other intelligent I/O modules; and system troubleshooting. Upon completion, students should be able to write and troubleshoot systems using high-level languages and complex I/O modules.

*Effective Term – Fall 2007 [2007*03] – CRC 09/20/06*

ATR 215	Sensors and Transducers	2	3	3
Prerequisites:	None			
Corequisites:	None			

This course provides the theory and application of sensors typically found in an automated manufacturing system. Topics include physical properties, operating range, and other characteristics of numerous sensors and transducers used to detect temperature, pressure, position, and other desired physical parameters. Upon completion, students should be able to properly interface a sensor to a PLC, PC, or process control system.

*Effective Term – Summer 1997 [1997*02]*

ATR 215	Sensors and Transducers	2	3	3
Prerequisites:	ELN 131			
Corequisites:	None			

This course provides the theory and application of sensors typically found in an automated manufacturing system. Topics include physical properties, operating range, and other characteristics of numerous sensors and transducers used to detect temperature, pressure, position, and other desired physical parameters. Upon completion, students should be able to properly interface a sensor to a PLC, PC, or process control system.

*Effective Term – Fall 2007 [2007*03] – CRC 09/20/06*

ATR 218	Comp Intg Manufacturing	2	3	3
Prerequisites:	None			
Corequisites:	None			

This course introduces high technology systems which are currently being used in new automated manufacturing facilities. Topics include integration of robots and work cell components, switches, proxes, vision and photoelectric sensors, with the automated control and data gathering systems. Upon completion, students should be able to install, program, and troubleshoot an automated manufacturing cell and its associated data communications systems.

*Effective Term – Summer 1997 [1997*02]*

ATR 218	Comp Intg Manufacturing	2	3	3
Prerequisites:	ATR 211			
Corequisites:	None			

This course introduces high technology systems which are currently being used in new automated manufacturing facilities. Topics include integration of robots and work cell components, switches, proxes, vision and photoelectric sensors, with the automated control and data gathering systems. Upon completion, students should be able to install, program, and troubleshoot an automated manufacturing cell and its associated data communications systems.

*Effective Term – Fall 2007 [2007*03] – CRC 09/20/06*

ATR 219	Auto Sys Troubleshooting	1	3	2
Prerequisites:	None			
Corequisites:	None			

This course introduces troubleshooting procedures used in automated systems. Topics include logical fault isolation, diagnostic software usage, component replacement techniques, and calibration; safety of equipment; and protection of equipment while troubleshooting. Upon completion, students should be able to analyze and troubleshoot an automated system.

*Effective Tern – Summer 1997 [1997*02]*

ATR 219	Auto Sys Troubleshooting	1	3	2
Prerequisites:	ATR 213			
Corequisites:	None			

This course introduces troubleshooting procedures used in automated systems. Topics include logical fault isolation, diagnostic software usage, component replacement techniques, and calibration; safety of equipment; and protection of equipment while troubleshooting. Upon completion, students should be able to analyze and troubleshoot an automated system.

*Effective Tern – Summer 1997 [1997*02]*

ATR 280	Robotic Fundamentals	3	2	4
Prerequisites:	None			
Corequisites:	None			

This course covers application, programming, and maintenance fundamentals for robotic devices. Emphasis is placed on terminology, problem solving, robotic systems controls, and hands-on projects. Upon completion, students should be able to apply basic concepts in application, programming, and robotic control systems.

*Effective Term – Fall 2007 [2007*03] – CRC 09/20/06*

ATR 281	Automation Robotics	3	2	4
Prerequisites:	None			
Corequisites:	None			

This course introduces the concepts and principles of automation in the manufacturing environment. Emphasis is placed on the devices used in hard and flexible automated systems, including the study of inputs, outputs, and control system integration. Upon completion, students should be able to plan, design, and implement automation to support manufacturing processes.

*Effective Term – Spring 2005 [2005*01] – CRC 09/15/04*

ATR 281	Automation Robotics	3	2	4
Prerequisites:	ELC 111 and HYD 110 or MEC 265			
Corequisites:	None			

This course introduces the concepts and principles of automation in the manufacturing environment. Emphasis is placed on the devices used in hard and flexible automated systems, including the study of inputs, outputs, and control system integration. Upon completion, students should be able to plan, design, and implement automation to support manufacturing processes.

*Effective Term – Summer 1997 [1997*02]*

ATR 281	Automation Robotics	3	2	4
Prerequisites:	ELC 111 and HYD 110			
Corequisites:	None			

This course introduces the concepts and principles of automation in the manufacturing environment. Emphasis is placed on the devices used in hard and flexible automated systems, including the study of inputs, outputs, and control system integration. Upon completion, students should be able to plan, design, and implement automation to support manufacturing processes.

*Effective Term – Spring 2005 [2005*01] – CRC 09/15/04*

ATR 282	Robotics and CIM	3	2	4
Prerequisites:	None			
Corequisites:	None			

This course covers robotics and CIM. Topics include application, programming, and maintenance of robotic devices and the relationship between robotics and CIM. Upon completion, students should be able to safely program, operate, and maintain robots and understand the relationship between robotics and CIM.

See the SEL and SEM prefixes for generic Selected Topics and Seminar course descriptions.