COURSE OUTLINE

RAA203

Prepared: Dean Matthews   Approved: Corey Meunier

Course Code: Title	RAA203: ROBOT PERIPHERALS
Program Number: Name	4068: ROBOTICS AUTOMATION
Department:	ROBOTICS GRADUATE CERTIFICATE
Semester/Term:	18W
Course Description:	The objective of this course is to introduce students to peripheral devices associated with automation cells. A variety of hardware and software devices and applications will be covered including end effectors, sensors, conveyors, line tracking encoders and safety devices
Total Credits:	3
Hours/Week:	3
Total Hours:	45
Prerequisites:	RAA100, RAA101, RAA102, RAA103, RAA106
Vocational Learning Outcomes (VLO's): **Please refer to program web page for a complete listing of program outcomes where applicable.**	**4068 - ROBOTICS AUTOMATION** #2. Plan and lead the installation of new industrial equipment and its physical and digital integration with existing systems. #5. Validate and optimize the functioning of motor, drive, control, and robotic systems. #6. Integrate budgetary, technical, functional and safety considerations in the design and optimization of custom automation solutions. #7. Formulate and use a variety of troubleshooting techniques on new and legacy electromechanical equipment, processes, systems and subsystems.
Essential Employability Skills (EES):	#1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience. #2. Respond to written, spoken, or visual messages in a manner that ensures effective communication. #3. Execute mathematical operations accurately. #4. Apply a systematic approach to solve problems. #5. Use a variety of thinking skills to anticipate and solve problems. #6. Locate, select, organize, and document information using appropriate technology and information systems. #7. Analyze, evaluate, and apply relevant information from a variety of sources. #9. Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.

	#10. Manage the use of time and other resources to complete projects. #11. Take responsibility for ones own actions, decisions, and consequences.
Course Evaluation:	

Evaluation Process and Grading System:		
	Evaluation Type	**Evaluation Weight**
	Assignments	40%
	Test 1	30%
	Test 2	30%

Books and Required Resources:	Automation, Production Systems, and Computer-Integrated Manufacturing by Mikell P. Groover Publisher: Pearson Edition: Fourth ISBN: 978-0-13-349961-2

Course Outcomes and Learning Objectives:	

Course Outcome 1.

Examine various types of end effectors used in robotic applications

Learning Objectives 1.

Investigate the use and application of vacuum grippers
Investigate the use and application of parallel grippers
Investigate the use and application of servo grippers
Examine dress package requirements and cable management used in robot applications

Course Outcome 2.

Examine various types of sensors and their applications

Learning Objectives 2.

Investigate different sensor types used in automation
Compare and contrast different sensors (photoelectric, diffuse, ultrasonic, etc...)

Course Outcome 3.

Examine the use of actuators, solenoids and encoders in industrial applications

Learning Objectives 3.

Illustrate different types of encoders (incremental, absolute)
Investigate how encoders are used for tracking parts in automation cells
Examine robot tracking software and how it uses encoders
Investigate how actuators are used in automation cells
Investigate how solenoids are used in peripheral devices

Course Outcome 4.

Examine various software packages as they pertain to robotic applications

Learning Objectives 4.

Investigate safety software as it pertains to robot cell layout
Examine ABB Pickmaster software for use in palletizing applications
Examine Robot Studio add-ins and power pacs.

Course Outcome 5.

Examine various safety devices and their peripheral integration in automation cells

Learning Objectives 5.

Examine different safety devices such as light curtains, area scanners and emergency stop interfaces
Identify applications of safety devices
Examine different safety fieldbus protocols used in industry

Date: Monday, December 18, 2017

Please refer to the course outline addendum on the Learning Management System for further information.