

Industrial Automation Assessment Plan Rev. 11/16/2019

Industrial Automation	16-17	17-18	18-19	19-20	20-21	21-22
INDAB100 - Industrial Design Graphics I						
• 1. Upon successful completion of the course, the student will be able to create a process flow diagram (PFD) using AutoCAD for a given systems design scenario. (B.S. PLO 4, ILO 3, Course Objectives 1, 5)				P		
• 2. Upon successful completion of the course, the student will be able to create a piping and instrument diagrams (P&ID) using AutoCAD for a given instrumentation and process control design scenario. (B.S. PLO 4, ILO 3, Course Objectives 1, 4)					P	
• 3. Upon successful completion of the course, the student will be able to design an instrumentation control panel and create AutoCAD diagrams and drawings for the designed panel using parameters and specifications provided by the instructor. (B.S. PLO4, ILO 3, Course Objectives 1, 3)						P
• 4. Upon successful completion of the course, the student will be able to create an electrical ladder diagram that represents a given control system example. (B.S. PLO 4, ILO 3, Course Objectives 1, 2)						P
INDAB105 - Materials Science for the Technician						
• 1. Upon successful completion of the course, the student will be able to select appropriate industrial materials for technical applications based on an analysis of operational requirements of an instructor-provided set of requirements and parameters. (B.S. PLO 3, ILO 3, Course Objectives 1,5).			C			
• 2. Upon successful completion of the course, the student will be able to diagnose and solve mechanical problems related to corrosion, wear, and galling for instructor-provided scenarios. (B.S. PLO 1, ILO 1, Course Objective 3).					P	
• 3. Upon successful completion of the course, the student will be able to propose processes to improve the functionality of mechanical components, including heat treatment, plating, and coatings. (B.S. PLO 3, ILO 3, Course Objectives 1,4).					P	
• 4. Upon successful completion of the course, the student will be able to organize and prepare laboratory reports summarizing the results of the testing of materials properties. (B.S. PLO 2, ILO 2, Course Objective 1).						P
INDAB110 - Industrial Automation Networks						
• 1. Upon successful completion of the course, the student will be able to 1.evaluate DCS and SCADA system applications to arrive at the best option for a given industrial process or industry.				P		
• 2. Upon successful completion of the course, the student will be able to configure, troubleshoot and test an Ethernet/IP copper and fiber communications link connected to managed Ethernet switches.					P	
• 3. Upon successful completion of the course, the student will be able to						P
INDAB114 - Industrial Safety Principles and Management						
• 1. Upon successful completion of the course, the student will be able to apply the correct Occupational Safety and Health Administration (OSHA) standards and procedures to industrial scenarios provided by the instructor. (B.S. PLO 1, ILO 1, Course Objectives 1, 2).				P		
• 2. Upon successful completion of the course, the student will be able to assess the possible options for injury prevention and employee safety utilizing personal protective equipment (PPE) and safety resources, general safe operating procedures, and hazardous location precautions, and correctly apply those options to various industrial job classifications. (B.S. PLO 1, ILO 1, Course Objectives 1, 2, 3).					P	
• 3. Upon successful completion of the course, the student will be able to						P
• 4. Upon successful completion of the course, the student will be able to apply the correct Occupational Safety and Health Administration (OSHA) standards and procedures to industrial scenarios provided by the instructor. (B.S. PLO 1, ILO 1, Course Objectives 1, 2).						P
INDAB120 - Industrial Automation Systems - Robotics						
• 1. Upon successful completion of the course, the student will be able to select the appropriate automated system components, including robotic systems, power systems, electromechanical systems, sensing and end-of-arm tooling, and vision systems, in order to implement an automated system or process (B.S. PLO 1, ILO 1, Course Objective 1).				P		
• 2. Upon successful completion of the course, the student will be able to develop a basic automated control systems maintenance plan for a set of equipment used in a sample production line (B.S. PLO 4, ILO 3, Course Objective 2).			C			
• 3. Upon successful completion of the course, the student will be able to perform basic robotic manipulations and program modification utilizing industry related robotic platforms. (B.S. PLO 4, ILO 3, Course Objective 3).					P	
• 4. Upon successful completion of the course, the student will be able to implement a series of automation processes utilizing industry related automation equipment. (B.S. PLO 1, ILO 1, Course Objective 3).						P

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INDAB122 - Applied Methods of Motion and Process Control						
• 1. Upon successful completion of the course, the student will be able to create an accurate P&ID (piping and instrument diagram), including instrument tags, utilizing a given scenario or process flow diagram. (B.S. PLO 1, ILO 1, Course Objectives 1, 5).			C			
• 2. Upon successful completion of the course, the student will be able to choose the correct calibration and verification method for a pressure, differential pressure, or temperature transmitter, given the process application for the instrument. (B.S. PLO 4, ILO 3, Course Objective 2).				P		
• 3. Upon successful completion of the course, the student will be able to assess a given process system or industrial application and determine the best choice of PID algorithms/control schemes. (B.S. PLO 4, ILO 3, Course Objectives 1, 3, 5).			C			
• 4. Upon successful completion of the course, the student will be able to design a operation/motion profile and program a variable frequency drive (VFD) or servo control drive system so that it will function according to parameters and guidelines provided to the student. (B.S. PLO 1, ILO 1, Course Objectives 1, 4, 5).			C			
• 5. Upon successful completion of the course, the student will be able to develop an operation procedure, Functional test, or trouble shooting procedure that applies to an industrial motion or process control system. Documentation will include product data sheets, safety procedures, and operation/function limit graphs. (B.S. PLO 4, ILO 3, Course Objective 5).			C			
INDAB125 - Operations Management in the Automation Field						
• 1. Upon successful completion of the course, the student will be able to compare and contrast various manufacturing industry sectors by examining similar and different process, layout, and location strategies. (B.S. PLO 1, ILO 1, Course Objectives 1,2,3).				P		
• 2. Upon successful completion of the course, the student will be able to categorize the various quality control and plant management of industry sectors. (B.S. PLO 4, ILO 3, Course Objective 4).					P	
• 3. Upon successful completion of the course, the student will be able to analyze optimal facility locations for both manufacturing and service organizations and select effective and efficient layout strategies. (B.S. PLO 5, ILO 4, Course Objectives 1,2,3,5).						P
INDAB132 - Project Management						
• 1. Upon successful completion of the course, the student will be able to define and analyze the benefits of project management and techniques to manage projects.				P		
• 2. Upon successful completion of the course, the student will be able to analyze project management terms and techniques such as initiating, planning, executing, monitoring, controlling, and closing projects, selection methods, work breakdown structures, Gantt charts, network diagrams, critical path analysis, and cost estimates while relating these to the Project Management Body of Knowledge (PMBOK) guide.					P	
• 3. Upon successful completion of the course, the student will be able to develop a plan using project management software to plan and manage a project including assignment and tracking of resources, tasks, budgets, costs and milestones.						P
INDAB135 - Economic Decision Making						
• 1. Upon successful completion of the course, the student will be able to analyze the effects of labor and material costs on selling price, profit margins, and breakeven analysis.				P		
• 2. Upon successful completion of the course, the student will be able to discuss the concept of an accounting analysis to include financial statements, depreciation methods, budgeting concepts, and overhead allocation.			C			
• 3. Upon successful completion of the course, the student will be able to apply cost and time estimating relationships and apply general cost and operations estimating methods and analysis.					P	
INDAB140 - Quality Management						
• 1. Upon successful completion of the course, the student will be able to describe concepts of quality management and improvement.			C	P		
• 2. Upon successful completion of the course, the student will be able to assess the role of technology, managers, employees, and customers in developing a quality-based workplace.			C		P	
• 3. Upon successful completion of the course, the student will be able to assess an organization or process through the application of Total Quality Improvement including, statistical process control, control charts, and quality function deployment techniques.			C			P
• 4. Upon successful completion of the course, the student will be able to collect data and analyze utilizing tools as related to process control and process capability.			C	P		
• 5. Upon successful completion of the course, the student will be able to describe current trends and benchmark organizations related to Quality Management.			C		P	
• 6. Upon successful completion of the course, the student will be able to appraise the ethical issues as related to quality of services and products.			C			

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INDAB143 - Materials and Maintenance Management						
• 1. Upon successful completion of the course, the student will be able to describe the strategic importance of a structured maintenance plan and analyze system reliability to interpret key failure metrics.			C	P		
• 2. Upon successful completion of the course, the student will be able to distinguish between preventive and corrective maintenance.			C		P	
• 3. Upon successful completion of the course, the student will be able to compare and interpret preventive maintenance costs and corrective maintenance costs			C			P
• 4. Upon successful completion of the course, the student will be able to analyze maintenance improvement methodologies and develop a Total Productive Maintenance (TPM) program plan.			C	P		
INDAB144 - Leadership						
• 1. Upon successful completion of the course, the student will be able to define the elements of leadership, discuss its importance, and understand the relationship of competence and how it relates to adding value to others.			C	P		
• 2. Upon successful completion of the course, the student will be able to analyze the values that guide your moral compass and the role of the leader in setting the moral tone and ethical climate of the workplace, learn and relate the Ethics of John C. Maxwell toward the Golden Rule and how its origins in many global religions and cultures developed, and research and understand the origins of ethical standards and how they apply to society and business operations.			C		P	
• 3. Upon successful completion of the course, the student will be able to appraise the practical steps a leader can take to empower others and develop a high-performance workplace.			C			P
INDAB150 - Systems Design and Integration (Senior Project)						
• 1. Upon successful completion of the course, the student will be able to develop, determine, or design a solution to a technical problem or challenge posed by the sponsoring company or BSIA program faculty in accordance with the required process of the course.			C			
• 2. Upon successful completion of the course, the student will be able to present and justify the solution to the technical problem or challenge, including: oral, written, and visual documentation and presentations.			C			
• 3. Upon successful completion of the course, the student will be able to create an adequate and successful working prototype or design.			C			