W11130-BA00XEN - Pegasus Robotics Simulation

Pegasus robotics simulation discusses the basic operation of the Pegasus robot. These skills include safety, power-up, shutdown, manual operation, homing, end effector operation. Skills taught also include basic robot programming including movement and effector commands, interfacing and material handling, application development, flexible manufacturing cells, quality control, production control, and work-cell development.

W-11130-BA-01 - Basic Robot Operation

Segment 1 - Power Up and Shutdown
Objective 1 - Define a Robot and Give an Application
Objective 2 - Describe Three Advantages of Robots
Objective 3 - Describe the Five Basic Robot Components
Activity 1 - Identification of Robot Components
Objective 4 - List Eight Rules of Robot Safety
Objective 5 - Describe the Operation of Five Types of Robot Safety Devices
Activity 2 - Pegasus Control Software Component Identification
Skill 1 - Power Up and Shut Down a Servo Robot
Self Review 1

Segment 2 - Manual Operation
Objective 6 - Describe Six Axes of a Robot Manipulator
Objective 7 - Describe Three Types of Jog Applications
Objective 8 - Describe the Function of a Robot Teach Pendant
Skill 2 - Jog a Servo Robot Using a Teach Pendant
Skill 3 - Jog a Servo Robot Using the Pegasus Control Software
Skill 4 - Adjust the Fast and Slow Jog Speed Settings
Self Review 2

Segment 3 - Homing
Objective 9 - Describe the Functions of the Four Components of a Servo Robot Axis
Activity 3 - Identification of Robot Axis Components
Objective 10 - Describe the Function of the Homing Procedure
Objective 11 - Describe the Operation of the Homing Procedure for a Servo Robot
Skill 5 - Home a Servo Robot
Self Review 3

Segment 4 - End Effector Operation
Objective 12 - Describe the Functions of Two Types of End Effectors
Objective 13 - List Two Types of Gripper Finger Designs and Describe Their Operation
Skill 6 - Manually Operate a Robot Gripper
Activity 4 - Robot Simulation Software Viewing Tools
Skill 7 - Move Parts Using the Manual Jog Function
Self Review 4
W-11130-BA-02 - Basic Robot Programming

Segment 1 - Teaching Points
Objective 1 - Describe the Function and Operation of a Robot Program
Objective 2 - Describe How Position Points are Recorded in a Robot's Memory
Skill 1 - Use a Teach Pendant to Teach Robot Position Points
Skill 2 - Test Teach Points
Skill 3 - Edit Teach Points
Self Review 1

Segment 2 - Basic Programming
Objective 3 - Describe the Function of Robot Programming Software and Give an Advantage
Skill 4 - Enter and Edit a Basic Robot Program
Objective 4 - Explain Four Ways to Stop a Servo Robot
Skill 5 - Run a Servo Robot Program
Skill 6 - Stop a Servo Robot Program
Self Review 2

Segment 3 - Movement and End Effector Commands
Objective 5 - Describe the Operation of the Command: PMOVE
Objective 6 - Describe the Operation of a Robot Program
Skill 7 - Enter a Robot Program that Uses the PMOVE Command
Objective 7 - Describe the Operation of the Program Commands: GRASP and RELEASE
Skill 8 - Enter a Robot Program that Uses the GRASP and RELEASE Commands
Skill 9 - Design a Robot Program to Perform a Basic Material Handling Task
Self Review 3

W-11130-BA-03 - Interfacing and Material Handling

Segment 1 - Looping and Speed Commands
Objective 1 - Describe the Operation of the Commands: LABEL and BRANCH
Skill 1 - Enter a Robot Program that Uses the LABEL and BRANCH Commands
Objective 2 - Describe the Operation of the Program Commands: SPEED and DELAY
Skill 2 - Enter a Robot Program that Uses the SPEED and DELAY Commands
Skill 3 - Design a Robot Program that Uses Looping, SPEED and DELAY Commands to Move an Object
Self Review 1

Segment 2 - I/O Interfacing
Objective 3 - Explain the Function of a Robot's Digital Inputs and Outputs
Skill 4 - Connect Digital Input and Output Devices to a Robot Controller
Objective 4 - Describe the Function of a Robot Operator Station
Skill 5 - Manually Test Discrete Inputs and Outputs
Objective 5 - Describe the Operation of the I/O Interface Commands: WAITI and WRITEO
Skill 6 - Enter a Program that Has WAITI and WRITEO Commands
Skill 7 - Design a Robot Program that Uses a Manual Operator Station
Self Review 2

**Segment 3 - Material Handling**
Objective 6 - Describe Three Applications of Robots in Material Handling
Objective 7 - Describe How Robots Are Applied to Plastic Injection Molding and List an Advantage
Skill 8 - Design a Robot Program that Will Unload an Automatic Machine
Self Review 3

**W-11130-BA-04 - Application Development**

**Segment 1 - CNC Machine Loading**
Objective 1 - Describe Three Classifications of Robot Applications
Skill 1 - Connect a Solenoid-Operated Pneumatic Valve to the Output of the Robot Controller
Skill 2 - Connect a Robot Operator Station to the Robot Controller
Objective 2 - Describe how Robots are Applied to CNC Machine Loading and Give an Advantage
Skill 3 - Design a Robot Program that Will Load and Unload an Automatic Machine
Self Review 1

**Segment 2 - Robot Workcell Envelope**
Objective 3 - Define the Work Envelope of a Robot
Objective 4 - Describe the Work Envelope of a Double-Jointed Robot and Give an Advantage
Skill 4 - Teach Points with a Double-Jointed Robot Arm Using the Full Range of Its Work Envelope
Skill 5 - Design a Robot Program that Uses a Robot's Double-Jointed Design
Objective 5 - Describe the Four Types of Robot Geometry and Give an Advantage of Each
Self Review 2

**Segment 3 - Robot Application Development**
Objective 6 - Describe Six Steps Used to Develop a Robot Program for a Given Application
Skill 6 - Design a Robot Program Given a General Description of the Application
Self Review 3

**Segment 4 - Basic Conveyor Operation**
Objective 7 - Define Material Transfer and Describe Five Methods
Objective 8 - Describe Three Conveyor Applications
Skill 7 - Connect and Configure a Servo Conveyor to a Servo Robot
Objective 9 - Describe Two Types of Conveyors and Give an Application of Each
Objective 10 - Describe the Operation of the External Motor Commands MON and MOFF
Skill 8 - Enter a Robot Program that Has MON and MOFF Commands
Skill 9 - Design a Robot Program that Uses a Conveyor
Self Review 4
Segment 1 - Conditional Commands
Objective 1 - Describe the Function of a Flow Chart and How to Construct One
Skill 1 - Construct a Flow Chart Given a General Sequence of Operations
Objective 2 - Describe the Function of Conditional Commands and Give an Advantage
Objective 3 - Describe the Operation of the Conditional Commands: IF-THEN, ELSE, ENDIF, and INP
Skill 2 - Enter a Robot Program that Has Conditional Commands: IF-THEN, ELSE, ENDIF, and INP
Skill 3 - Design a Robot Program that Sorts Parts
Self Review 1

Segment 2 - Flexible Manufacturing Cells
Objective 4 - Describe How Robots Are Applied to Multiple Machine Loading Cells and Give an Advantage
Skill 4 - Design a Robot Program that Will Unload Two or More Automatic Machines
Self Review 2

Segment 3 - Subroutine Commands
Objective 5 - Describe the Function of a Subroutine and Give an Advantage
Objective 6 - Describe the Operation of the Subroutine Commands: CALL, RETURN, and SUB
Skill 5 - Enter a Robot Program that Has Subroutine Commands: CALL, RETURN, and SUB
Skill 6 - Design a Robot Application Using a Subroutine
Self Review 3

Segment 4 - Servo Conveyor Operation
Objective 7 - Describe Two Methods of Controlling Conveyors and Give an Advantage of Each
Objective 8 - Describe the Operation of the Robot Command DDMOVE
Objective 9 - Describe How to Vary the Speed of a Conveyor Controlled by a Robot
Skill 7 - Enter a Robot Program that Has a DDMOVE Command
Skill 8 - Design a Robot Program that Uses a Servo Conveyor
Self Review 4
W-11130-BA-06 - Quality Control

Segment 1 - Cartesian Coordinate Programming
Objective 1 - Explain How the Cartesian Coordinate System Is Used with Robots
Skill 1 - View the Current Location of a Robot in Cartesian Coordinates
Objective 2 - Describe How a Move Command Is Specified Using Cartesian Coordinates
Skill 2 - Use the PMOVE Function with Cartesian Coordinates to Move a Robot to a Position
Skill 3 - Enter a Robot Program that Uses Points Stored in Cartesian Coordinates
Self Review 1

Segment 2 - Go No-Go Inspection
Objective 3 - Describe How Robots Are Applied to a Go No-Go Inspection
Objective 4 - Describe the Operation of the Command: TESTI
Skill 4 - Enter a Robot Program that Has the TESTI Command
Skill 5 - Design a Robot Program to Perform a Go No-Go Inspection
Self Review 2

Segment 3 - Robot Operator Interface
Objective 5 - Explain How Robots and Operators Communicate with Each Other and Give an Application
Objective 6 - Describe the Function of Two Types of Variables
Objective 7 - Explain Five Rules for Naming Variables
Objective 8 - Describe Two Ways Variable Names Can Be Used with Move Commands
Skill 6 - Enter a Robot Program that Uses a Variable Name
Objective 9 - Describe the Operation of the Operator Interface Commands: PRINT and PRINTLN
Skill 7 - Enter a Robot Program that Uses the PRINT and PRINTLN Commands
Skill 8 - Design a Program that Provides an Operator Interface on a Computer Screen
Self Review 3

Segment 4 - Parts Measurement
Objective 10 - Explain How Robots Are Used to Measure Parts
Objective 11 - Describe the Operation of the Measuring Command: MEASURE
Skill 9 - Enter a Robot Program that Has a MEASURE Command
Skill 10 - Design a Robot Program to Inspect Parts by Measuring Them in the Robot's Gripper
Self Review 4
Segment 1 - Operator Input Interface
Objective 1 - Describe the Operation of the INPUT Command
Skill 1 - Enter a Robot Program that Uses an INPUT Command
Self Review 1

Segment 2 - Relational and Arithmetic Operators
Objective 2 - List and Describe the Function and Operation of Four Basic Arithmetic Operators
Objective 3 - List and Describe the Function and Operation of Six Relational Operators
Skill 2 - Enter a Robot Program that Uses Arithmetic and Relational Operators
Skill 3 - Design a Robot Program that Stops a Production Process if a Quality Standard Is Not Met
Self Review 2

Segment 3 - Loop Commands
Objective 4 - Describe the Function of a Loop Command
Objective 5 - Describe the Operation of the Loop Commands: FOR, NEXT, and STEP
Skill 4 - Enter a Robot Program that Has Loop Commands
Skill 5 - Design a Robot Application Using FOR-NEXT Commands
Self Review 3

W-11130-BA-08 - Workcell Development

Segment 1 - Object Creation
Objective 1 - Describe the Function of Robotic Simulation Software
Objective 2 - Describe Two Types of Robotic Simulation Objects
Objective 3 - Define a Simple Object and List Four Types
Objective 4 - Describe How to Create a Simple Robotic Simulation Object
Skill 1 - Create a Simple Object
Objective 5 - Describe How to Position a Workcell Object
Skill 2 - Position a Workcell Object
Objective 6 - Describe How to Rotate Workcell Objects
Skill 3 - Rotate a Workcell Object
Self Review 1

Segment 2 - Functional Objects
Objective 7 - Define a Functional Object and List Five Types
Objective 8 - Describe How to Configure and Load a Feeder
Skill 4 - Configure and Load a Feeder
Objective 9 - Describe a Static Object and Give an Example
Skill 5 - Insert a Static Object Into a Workcell
Self Review 2
Segment 3 - Discrete I/O Objects
Objective 10 - Describe How to Configure an Input Object
Skill 6 - Configure an Input Object
Objective 11 - Describe How to Configure an Output Object
Skill 7 - Configure an Output Object
Objective 12 - Describe How to Configure an Auxiliary Servo Object
Skill 8 - Configure an Auxiliary Servo Object
Skill 9 - Design a Workcell for a Production Task
Self Review 3