App B Competencies Title	App B Competencies Subsecton(s)
ELECTRONICS-MECHANIC (CNC SYSTEMS MAINTENANCE)	Trade Theory - Hydraulics
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Employer Input (Importance/Frequency)	Learning Objectives
N/A	Intro to Hydraulics
Important/Everyday	Circuit Connections
Important/Everyday	Hands On Activity 1
Important/Everyday	Basic Cylinder Circuits
Important/Everyday	Hands On Activity 2
Very Important/Once a Week	Hands On Activity 3
Very Important/Once a Week	Pumps
Very Important/Once a Week	Needle Valves
Very Important/Once a Week	Hands On Activity 4
Important/Once a Month	Basic Motor Circuits
Extremely Important/Once a Week	Hands On Activity 5
Extremely Important/Once a Week	Relief & Check Valves
Extremely Important/Once a Week	Flow Control Valve
Extremely Important/Once a Week	Meter-In / Meter-Out Flow Control
Important/Everyday	Hands On Activity 6
Very Important/Once a Month	Pressure vs Cylinder Force
Very Important/Once a Month	Hydraulic Leverage
Very Important/Once a Month	Fluid Friction
Very Important/Once a Month	Hands On Activity 7

Course Assessment(s)
Hands On Activity 1, Online Quiz
Hands On Activity 1, Online Quiz
Completion of Hands On Activity 1
Hands On Activity 2 & 3, Online Quiz
Completion of Hands On Activity 2
Completion of Hands On Activity 3
Hands On Activity 4, Online Quiz
Hands On Activity 4, Online Quiz
Completion of Hands On Activity 4
Hands On Activity 5, Online Quiz
Completion of Hands On Activity 5
Hands On Activity 6, Online Quiz
Hands On Activity 6, Online Quiz
Hands On Activity 6, Online Quiz
Completion of Hands On Activity 6
Hands On Activity 7, Online Quiz
Hands On Activity 7, Online Quiz
Hands On Activity 7, Online Quiz
Completion of Hands On Activity 7

Learning Activities
Discuss Intro to Hydraulics topics
Discuss Circuit Connections
Perform hands on activites to include: 1) Draw a hydraulic schematic from the actual circuit connections
Discuss Basic Cylinder Circuits
Perform hands on activites to include: 1) Hydraulic component identification
Perform hands on activites to include: 1) Basic operation of a double-acting cylinder
Discuss Pumps
Discuss Needle Valves
Perform hands on activites to include: 1) Connect and read a flow meter
Discuss Basic Motor Circuits
Perform hands on activites to include: 1) Connect and operate a bi-directional hydraulic motor using a 3-position, manually-operated
Discuss Relief & Check Valves
Discuss Flow Control Valve
Discuss Meter-In / Meter-Out Flow Control
Perform hands on activites to include: 1) Connect a relief valve in a circuit to limit pressure in the system
Discuss Pressure vs Cylinder Force
Discuss Hydraulic Leverage
Discuss Fluid Friction
Perform hands on activites to include: 1) Calculate the extension force of a cylinder given its size and pressure

Resources (Content)	Completed
Presentation slides, interactive online activities, online quiz	N/A
Presentation slides, interactive online activities, online quiz	N/A
Hydraulics control system lab equipment, pressure gauge, motor, cylinder, DCV, needle	N/A
Presentation slides, interactive online activities, online quiz	N/A
Hydraulics control system lab equipment, pressure gauge, motor, cylinder, DCV, needle	N/A
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Presentation slides, interactive online activities, online quiz	N/A
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Presentation slides, interactive online activities, online quiz	N/A
Presentation slides, interactive online activities, online quiz	N/A
Hydraulics control system lab equipment, pressure gauge, motor, cylinder, DCV, check	N/A
Presentation slides, interactive online activities, online quiz	N/A
Presentation slides, interactive online activities, online quiz	N/A
Hydraulics control system lab equipment, pressure gauge, motor, cylinder, DCV, needle	N/A