

- (iv) apply competencies related to problem solving
 - (v) apply competencies related to critical thinking
 - (vi) apply competencies related to systems of operation
- (E) demonstrate knowledge of personal and occupational safety, health, environmental regulations, and first-aid policy in the workplace; and
- (i) demonstrate knowledge of personal safety policy in the workplace
 - (ii) demonstrate knowledge of occupational safety policy in the workplace
 - (iii) demonstrate knowledge of personal health policy in the workplace
 - (iv) demonstrate knowledge of occupational health policy in the workplace
 - (v) demonstrate knowledge of personal environment (f) 3 (w) (e) 7.1 (al) 3 (t) 0.7 (h) -2.1 (p) -2.1 (ol) 3 (w) (e) 7.1 (al) 3 (t) 0.7

- (B) demonstrate safety precaution measures in pneumatics and discuss the importance of safety equipment during this process; and
 - (i) demonstrate safety precaution measures in pneumatics
 - (ii) discuss the importance of safety equipment during [the pneumatic] process
 - (C) demonstrate and explain the importance of a pressure regulator in pneumatics, including the historical significance.
 - (i) demonstrate the importance of a pressure regulator in pneumatics, including the historical significance.
 - (ii) explain the importance of a pressure regulator in pneumatics, including the historical significance.
- (5) The student demonstrates an understanding of basic cylinder circuits and pneumatic cylinder circuits and their significance and applications in the petroleum engineering industry. The student is expected to:
- (A) explain the functions of the operation of a double acting pneumatic cylinder and each of its functions;
 - (i) explain the functions of the operation of a double acting pneumatic cylinder
 - (ii) explain each of [double acting pneumatic cylinder's] functions
 - (B) describe the operation of five-way three-position directional control valves (DCV);
 - (i) describe the operation of five-way three-position directional control valves (DCV)
 - (C) describe the function of a pneumatic quick-connect fitting; and
 - (i) describe the function of a pneumatic quick-connect fitting
 - (D) demonstrate how to safely connect the pneumatic circuit with a quick-connect fitting.
 - (i) demonstrate how to safely connect the pneumatic circuit with a quick-connect fitting
- (6) The student understands the impact of a hydraulic schematic in oil field applications. The student is expected to:
- (A) describe ISO symbols and appropriately use them to draw a hydraulic schematic; and
 - (i) describe ISO symbols
 - (ii) appropriately use [ISO symbols] to draw a hydraulic schematic
 - (B) create a hydraulic schematic.
 - (i) create a hydraulic schematic
- (7) The student identifies the principles of hydraulic pressure and flow and discusses the basic hydraulic cylinder circuits and their application. The student is expected to:
- (A) calculate the force output of an extending cylinder and the retraction force of a cylinder;
 - (i) calculate the force output of an extending cylinder
 - (ii) calculate the retraction force of a cylinder
 - (B) explain the relevance of Pascal's Law to hydraulics;
 - (i) explain the relevance of Pascal's Law to hydraulics

- (C) identify and discuss hydraulic motors and pumps; and
 - (i) identify hydraulic motors
 - (ii) identify hydraulic pumps
 - (iii) discuss hydraulic motors
 - (iv) discuss hydraulic pumps
- (D) identify hydraulic cylinders and their impact on single and double acting circuits.
 - (i) identify hydraulic cylinders
 - (ii) identify [hydraulic cylinders'] impact on single acting circuits
 - (iii) identify [hydraulic cylinders'] impact on double acting circuits