

Bossier Parish Community College
Master Syllabus

Course Prefix and Number: OGPT 153

Credits: 3-2-2

Course Title: Hydraulic/Pneumatic Applications for the Oil and Gas Industry with Lab

Course Prerequisite: MATH 102

Textbook: Klette, Patrick. Fluid Power Systems. American Technical Publishers, 2010. ISBN: 9780826936288.

Other reference materials for class instruction: Amatrol Lab Reference Books and Manuals; LabVolt Lab Reference Books and Manuals; Simtronics Simulation Software

Course Description: Major topics include pressure units applicable to hydraulics systems, Pascal's Law, transmission of energy in hydraulic systems, mechanical advantage, flow measurement, pumps, motors, accumulators, cylinders, pipe networks, open channels, dams, reservoirs and flow measurement devices. Students will learn to calculate properties of fluids such as velocity, pressure, density and temperature, and calculating and evaluating the characteristics of the flowing and static fluids in various tubular and annular systems. Curriculum presents a study of the functions and properties of the fluids used in drilling an oil or gas well, such as the various types of mud systems for different formations. Students will learn to perform and interpret basic calculations and tests that are performed on these fluids. Additional topics include maintenance, safety, preventive maintenance, and troubleshooting. Course materials and instruction is referenced to common oil and gas industry applications and practices.

Learning Outcomes:

At the end of the course, the student will:

- A. demonstrate familiarization with symbols and terminology used to design, develop, and analyze hydraulic systems and pneumatic systems as applied to the upstream energy industry;
- B. determine and measure force transmitted through hydraulic systems and pneumatic systems in oil and gas applications;
- C. described Hydraulic Principles commonly practiced in the oil and gas industry;
- D. described Pneumatic Principles commonly practiced in the oil and gas industry; and
- E. demonstrate fluid and pneumatic characteristics and applications utilized within the energy industry.

To achieve the learning outcomes, the student will or will be able to:

(The letter designations at the end of each statement refer to the learning outcome(s).)

1. define terminology and measurement used in hydraulic/pneumatic systems; (B)
2. describe how hydraulic/pneumatic transmission of force and energy is accomplished; (A,B)
3. describe the dynamics of fluid hydrostatic pressures; (C)
4. list different types of hydraulic/pneumatic actuators; (C, D)

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5. describe how control of hydraulic/pneumatic energy is accomplished; (E)
6. identify check valves, accumulators, and cylinders; (C, D)
7. identify directional valves and explain the difference between 4-way, 3-way, and 2-way controllers valves; (C, D)
8. draw the symbol and explain operation of “flow control” and hydraulic/pneumatic systems; (A, B, C, D)
9. explain the uses of pressure control valves, pumps, and hydraulic motors; and (C, E)
10. describe hydraulic fluid pressures and dynamics, reservoir dynamics, coolers, fluid weight, viscosity and filters. (E)

Course Requirements: Complete all homework assignments, lecture tests and final exam.

Course Grading Scale:

90% to 100%	=	A
80% to < 90%	=	B
70% to < 80%	=	C
60% to < 70%	=	D
< 60%	=	F

Attendance Policy: The college attendance policy is available at <http://www.bpcc.edu/catalog/current/academicpolicies.html>

Course Fees: This course is accompanied with an additional non-refundable fee for supplemental materials, laboratory supplies, software licenses, certification exams, and/or clinical fees.

Nondiscrimination Statement: Bossier Parish Community College does not discriminate on the basis of race, color, national origin, gender, age, religion, qualified disability, marital status, veteran's status, or sexual orientation in admission to its programs, services, or activities, in access to them, in treatment of individuals, or in any aspect of its operations. Bossier Parish Community College does not discriminate in its hiring or employment practices.

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