**Oakton Community College**

**Hydraulics, Pneumatics, and Controls**

**I.     Course Prefix/Number:** MFG 135

**Course Name:** Hydraulics, Pneumatics, and Controls

**Credits:** 3 (2 lecture; 2 lab)

**II.    Prerequisite**

None

**III.   Course (Catalog) Description**

Instruction is divided between hydraulic, pneumatic, and control areas. Hands-on operation and troubleshooting of training equipment is used to illustrate fluid properties, pressure, and pipe friction. Actual components used includes: pumps, reservoirs and accumulators, actuators, control valves, packing and seals, compressors, and electrical controls (including PLC’s). The course targets those who maintain and design fluid power systems.

**IV.   Learning Objectives**

To understand the theory and practices of fluid power.

**V.    Academic Integrity**

Students and employees at Oakton Community College are required to demonstrate academic integrity and follow Oakton's Code of Academic Conduct. This code prohibits:  
  
• cheating,   
• plagiarism (turning in work not written by you, or lacking proper citation),   
• falsification and fabrication (lying or distorting the truth),   
• helping others to cheat,   
• unauthorized changes on official documents,   
• pretending to be someone else or having someone else pretend to be you,   
• making or accepting bribes, special favors, or threats, and   
• any other behavior that violates academic integrity.   
  
There are serious consequences to violations of the academic integrity policy. Oakton's policies and procedures provide students a fair hearing if a complaint is made against you. If you are found to have violated the policy, the minimum penalty is failure on the assignment and, a disciplinary record will be established and kept on file in the office of the Vice President for Student Affairs for a period of 3 years.   
Details of the Code of Academic Conduct can be found in the Student Handbook.

**VI.   Sequence of Topics**

1. Principles of Hydraulics  
2. Fluids for Hydraulics  
3. Sealing Hydraulic Devices  
4. Hydraulic Power  
5. Hydraulic Power Sources  
6. Control of Hydraulic Power  
    6.1 Directional Valves  
    6.2 Open and Closed Center Circuits  
    6.3 Flow Control Valves  
    6.4 Restrictors  
    6.5 Metering Circuits  
7. Hydraulic actuators  
    7.1 cylinders  
    7.2 motors  
8. Troubleshooting of hydraulic systems  
9 Principle of pneumatics  
10. Compressed air systems  
11. Pneumatics controls  
    11.1 directional valves  
    11.2 solenoid valves  
    11.3 regulators  
    11.4 filters  
    11.5 lubricators  
12. Use of pneumatic power and troubleshooting pneumatic systems  
13. Electrical control including PLC’s

**VII.  Methods of Instruction**

Lectures, demonstrations, and weekly labs.  
Course may be taught as face-to-face, media-based, hybrid or online course.

**VIII. Course Practices Required**

Regular attendance and participation in labs is required.

**IX.   Instructional Materials**

Parker Hannafin ‘Guide to Hydraulics/Pneumatics’

**X.    Methods of Evaluating Student Progress**

Examinations, quizzes, and lab practicals.

**XI.   Other Course Information**

If you have a documented learning, psychological, or physical disability you may be entitled to reasonable academic accommodations or services. To request accommodations or services, contact the ASSIST office in the Learning Center. All students are expected to fulfill essential course requirements. The College will not waive any essential skill or requirement of a course or degree program.

**XII. Instructor:**

Dave Geller

Chair, Manufacturing and CAD Technology

847-376-7707

dgeller@oakton.edu

This workforce solution was funded by a grant awarded by the U.S. Department of Labor’s Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timelines, usefulness, adequacy, continued availability, or ownership. This solution is copyrighted by the institution that created it. Internal use, by an organization and/or personal use by an individual for non-commercial purposes, is permissible. All other uses require the prior authorization of the copyright holder.