

Purpose:

To develop a course that links Fluid Power to Automation.

Rationale:

Fluid power has long been thought to be a mature technology. However as with most technologies new life is being breathed into it by the intimate marriage between Fluid Power and Automation. The modern technician must possess a strong understanding of the principals of Fluid Power and the interfacing with Automation.

Internal course description:

In any Automation System the final output to the real world requires usable force at many power levels. Due to its ability to provide infinitely small to extremely large forces with great precision, Fluid power is one of the key technologies linked to automation. This course is concerned with the integration of the brain and muscle of automated systems. Students of this course will be primarily engineering technologists who are geared toward the Automation Field.

State common course description:

*This course is active within the CCL.*

HYD-180\_2013FA                                      Fluid Power in Automation                                      HYD-180

CIS Course ID    S23491

Effective Term    Fall 2013

End Term

Class    2    Lab    3    Clinical    0    Work    0    Credit    3

This course introduces the basic components and functions of hydraulic and pneumatic systems and their application to automated machinery. Topics include standard symbols, compressors, control valves, control circuits, actuators, maintenance procedures, switching and control devices as applied to automated machinery. Upon completion, students should be able to demonstrate an understanding of the operation of hydraulic fluid and compressed air and vacuum systems including design, troubleshooting, and applications.

Minimum State Prerequisites                      None

Minimum State Co-requisites                      None

College Transfer                                      N/A

National ID (CIP)                                      15.1103 Hydraulics and Fluid Power Technology/Technician

Illustration of course segment relationships:

Appendix A

Course layout:

- 1) Review of control Theory and Application of control loops
- 2) The Brains of Automation
- 3) Crossing the Brain Machine Barrier-Equipment interface
- 4) Control of Digital Fluid power- Hard wired or Field Bus
- 5) Sensors-Pressure, Position, Temperature
- 6) Precision Positioning-Balanced Pressure\ Lock and Hold
- 7) Servo Control Components-Valve Types
- 8) Servo Control Integration-The Time Problem
- 9) Variable Flow Control-VSD, Prime Mover, Pressure Compensation
- 10) The Special Problem- Human Machine Interface

Lab work Layout:

Similar to course work- Exact Labs to be determined by equipment to be acquired

Textbook:

No acceptable textbook found. Use online resources available and homegrown material using automation studio. The student assignments will be research assignments particular to each of the ten subject areas.

Course initiation:

The Course has been set to have its first offering in fall 2013. The course start day is set by the State curriculum standard and by the college's curriculum improvement process. All curriculum standards have been submitted and approved.

# Fluid Power In Automation

