



COURSE OUTLINE

MCH258

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Prepared: Cam Pucci Approved: Corey Meunier

Course Code: Title	MCH258: PNEUMATICS AND HYDRAULICS
Program Number: Name	4039: MECH. ENG. TN-MANUFA
Department:	MECHANICAL TECHNIQUES PS
Semester/Term:	17F
Course Description:	This course will cover hydraulics and pneumatics. On completion of the course, the student will understand basic hydraulic/pneumatic theory. Discussion will include advantages, design, safety, servicing, replacing parts, conducting lines, proper installation, functions of fluids, and troubleshooting. Reservoirs, filters, pumps, valves, motors, actuators, accumulators and other various equipment will be discussed. The student will be able to design, draw and assemble schematic circuits using Vickers' trainers and the Lab-Volt computerized simulators. Modern testing equipment will be used to test circuits and valves.
Total Credits:	4
Hours/Week:	4
Total Hours:	60
This course is a pre-requisite for:	MCH125
Vocational Learning Outcomes (VLO's):	<p>#1. Complete all work in compliance with current legislation, standards, regulations and guidelines.</p> <p>#3. Comply with current health and safety legislation, as well as organizational practices and procedures.</p> <p>#5. Use current and emerging technologies to support the implementation of mechanical engineering projects.</p> <p>#6. Analyze and solve mechanical problems by applying mathematics and fundamentals of mechanical engineering.</p> <p>#7. Interpret, prepare and modify mechanical engineering drawings and other related technical documents.</p> <p>#8. Contribute to the design and the analysis of mechanical components, processes and systems applying fundamentals of mechanical engineering.</p> <p>#9. Manufacture, assemble, maintain and repair mechanical components according to required specifications.</p> <p>#10. Verify the specifications of materials, processes and operations to support the design and production of mechanical components.</p>
Please refer to program web page for a complete listing of program outcomes where applicable.	



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Essential Employability Skills (EES):	<p>#2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.</p> <p>#3. Execute mathematical operations accurately.</p> <p>#4. Apply a systematic approach to solve problems.</p> <p>#5. Use a variety of thinking skills to anticipate and solve problems.</p> <p>#6. Locate, select, organize, and document information using appropriate technology and information systems.</p> <p>#7. Analyze, evaluate, and apply relevant information from a variety of sources.</p> <p>#9. Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.</p> <p>#10. Manage the use of time and other resources to complete projects.</p>										
Course Evaluation:	<p>Passing Grade: 50%, D</p>										
Other Course Evaluation & Assessment Requirements:	<p>Grade Definition Grade Point Equivalent A+ 90 – 100% 4.00 A 80 – 89% B 70 - 79% 3.00 C 60 - 69% 2.00 D 50 – 59% 1.00 F (Fail) 49% and below 0.00</p> <p>CR (Credit) Credit for diploma requirements has been awarded. S Satisfactory achievement in field /clinical placement or non-graded subject area. U Unsatisfactory achievement in field/clinical placement or non-graded subject area. X A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course. NR Grade not reported to Registrar’s office. W Student has withdrawn from the course without academic penalty.</p>										
Evaluation Process and Grading System:	<table border="1"> <thead> <tr> <th>Evaluation Type</th> <th>Evaluation Weight</th> </tr> </thead> <tbody> <tr> <td>Final Exam</td> <td>5%</td> </tr> <tr> <td>Student Performance</td> <td>15%</td> </tr> <tr> <td>Term Assignments</td> <td>40%</td> </tr> <tr> <td>Term Tests</td> <td>40%</td> </tr> </tbody> </table>	Evaluation Type	Evaluation Weight	Final Exam	5%	Student Performance	15%	Term Assignments	40%	Term Tests	40%
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Books and Required	<p>Industrial Hydraulic Manual by Eaton Vickers</p>										



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Resources:

Publisher: Eaton Corporation Industrial Section - Hydraulics Group Edition: 5th
ISBN: 9780978802202
2nd print

Course Outcomes and Learning Objectives:

Course Outcome 1.

Discuss the physical laws and concepts dealing with hydraulics and pneumatics.

Learning Objectives 1.

- Pascal's Law - force / area / pressure
- Conservation of Energy Law
- Boyle's Law
- Bernoulli's Law
- Bramah's design
- Laminar / turbulent flows
- Gauge / atmospheric pressures
- Basic design calculations
- Velocity characteristics
- Discuss aeration, cavitation, pump flow

Course Outcome 2.

- Compare hydraulics to other sources
- Understand why hydraulics is used today

Learning Objectives 2.

- List proper safety measures to be used when servicing hydraulics/pneumatics systems
- Understand how to adjust valves using safe practices
- Be able to safely replace components on a any system using safe work practices
- Understand safe lock out practices for systems
- Understand the dangers involved in various types of high pressure hydraulics

Course Outcome 3.



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Types of hydraulic and pneumatic conductors used today

Learning Objectives 3.

- Discuss various types of steel piping and fittings used in hydraulics
- Discuss various types of tubing and fittings used today
- Discuss hydraulic hoses used
- Discuss sizing, grade, strength, and safety rating of each type of conductor
- Discuss proper installation techniques for each type of conductor

Course Outcome 4.

Hydraulic Fluids

Learning Objectives 4.

- Understand the functions of fluids in hydraulic systems
- Be knowledgeable of the various types of hydraulic fluids used and why
- Understand basic fluid conditioning monitoring needed
- Discuss proper filtering methods and ratings used today
- Discuss proper testing methods available today

Course Outcome 5.

Hydraulic and Pneumatic Components / Accessories

Learning Objectives 5.

- Reservoirs
- Pumps/Compressors
- Filters
- Directional valves
- Relief valves
- Pressure valves
- Actuators



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- Accumulators and other system accessories

Course Outcome 6.

Systems

Learning Objectives 6.

- Be able to draw, and hook up various circuits on the Vickers's trainers in the Lab as assigned.
- Simulate circuits using Lab-Volt computerized programs
- Perform basic troubleshooting on the Trainers as assigned
- Be able to perform basic preventative maintenance measures

Date:

Friday, September 1, 2017

Please refer to the course outline addendum on the Learning Management System for further information.