

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: HYDRAULICS-PNEUMATICS

CODE NO: MCH243 **SEMESTER:** 4

PROGRAM: MECHANICAL ENGINEERING TECHNICIAN - MACHINING

AUTHOR: BRUCE PROUT

DATE: JAN. 1992 **PREVIOUS OUTLINE DATED:** JAN. 1987

APPROVED:


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INDUSTRIAL HYDRAULICS/PNEUMATICS - MCH 243

COURSE DURATION - 48 HOURS

PROFESSOR - MR. BRUCE PROUT

1.0 INTRODUCTION

1.1 Course Objectives

Hydraulic and pneumatic systems are widely used in industry as means to transmit power, control motion and to do work. Tradesmen and Technicians are often required to assist in maintenance, repair and troubleshooting of hydraulic and pneumatic systems.

In order to be effective in the field, knowledge of hydraulic fundamentals is required. This course is intended to provide an basic understanding of hydraulic and pneumatic theory, component operation and circuit design.

1.2 Performance Objectives

Upon successful completion of this course, the student will have demonstrated:

- a) an understanding of hydraulic theory, based on principles of Physics and Fluid Mechanics.
- b) familiarity with terminology and circuit schematics.
- b) knowledge of the components in a hydraulic system, their functions, and operating details.
- c) an understanding of the process of system design.
- d) an ability to specify components required for a simple hydraulic system.
- e) an ability to complete a standard series of lab exercises involving hydraulic and pneumatic circuits.
- f) an basic understanding of circuit troubleshooting techniques.
- g) regular and punctual class attendance and assignment completion.

1.3 Course Structure

- a) Introduction - Background
 - Introduction to Hydraulics
 - Principles of Power Hydraul
- b) Actuators
- c) Fluids, Reservoirs, Filters
- d) Pumps
- e) Directional Control
- f) Flow Control
- g) Pressure Control
- h) Valve Design and Control
- i) Accessory Equipment
- j) Hydraulic Circuits
- k) Lab Circuit Exercises

1.4 Learning Methods

- a) Topic Discussion
- b) Individual reading and study
- c) Summary notes
- d) Film viewing and analysis
- e) Circuit design
- g) Tests and assignments
- h) Lab exercises

1.5 Textbook

Vickers Industrial Hydraulics Manual

2.0 GRADING

2.1 Final Mark

Final marks will be compiled in the following way:

Tests.....70%
Quizzes/Assignments.....30%

2.2 Final Grade

Final grade will be assigned according to the final mark as follows:

A+ = 90% - 100%
A = 80% - 89%
B = 70% - 79%
C = 55% - 69%
R, I = less than 55%

Notes: Successful completion of all the lab assignments is a requirement for receiving a completion credit for this course.

Students having "I" grades may be given opportunity to repeat up to two "incomplete" tests, one time only. If the revised average is over 55%, the previous "I" grade will be replaced with a "C" grade (55%). If revised final mark is not over 55%, a final "R" grade will be assigned, and the student will be obliged to repeat the course.

To qualify for a re-write opportunity, a student must have completed at least 80% of the quizzes and assignments, AND have a class attendance record of greater than 80% for the term.

2.3 Tests

A maximum of four written tests are planned throughout the term.

There will at least one week notice provided for each test, to allow for preparation.

Students who will be absent for a scheduled test must contact the instructor in ADVANCE. Students absent without prior notification and a valid reason will be assigned a "ZERO" grade for the missed test.

2.4 Quizzes

Quizzes will be held without notice, throughout the term. One of the purposes of quizzes is to encourage regular attendance. Students who are absent the day of a quiz will be given a "ZERO" grade, unless the instructor was contacted in ADVANCE. Having a valid reason, the student will be given the opportunity to write the quiz. There will be no "re-writes" for "I" grade quizzes.

2.5 Assignments

Homework assignments may be given throughout the term. Late or unsubmitted assignments will be given a "zero" grade, unless PREVIOUS arrangements were made with the instructor.

3.0 Classroom Order

- a) Discussion, questions, and general interaction will be encouraged as positive features of the learning process.
- b) Disruptive conduct is not acceptable.
- c) Other course work or study will not be permitted during lecture or lab periods.
- d) Honesty, fairness and respectable treatment of others are basic principles that will govern at all times.

4.0 Special Notes

Students with special needs (eg. physical limitations, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

Your instructor reserves the right to modify the guidelines as deemed necessary under special circumstance.