

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



Sault College

**COURSE OUTLINE**

**COURSE TITLE:** HYDRAULIC SYSTEMS

**CODE NO. :** MCH 221 **SEMESTER:** 5

**PROGRAM:** AVIATION TECHNOLOGY (FLIGHT)

**AUTHOR:** Karl Uchmanowicz

**DATE:** Jan / 04 **PREVIOUS OUTLINE DATED:** /00

**APPROVED:**

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**DEAN** **DATE**

**TOTAL CREDITS:** 4

**PREREQUISITE(S):**

**HOURS/WEEK:** 4 HRS/WEEK plus labs

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*For additional information, please contact Colin Kirkwood, Dean*  
*School of Technology, Skilled Trades & Natural Resources*  
*(705) 759-2554, Ext. 688*

- I. COURSE DESCRIPTION:** Hydraulics is used as a power and control of many operations on aircraft. This course is intended to provide a fundamental understanding of hydraulic theory, fluid power theory, component operations, circuit design and system troubleshooting.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

Upon successful completion of this course, the student will demonstrate the ability to:

1. Understand fundamental fluid principles

Potential Elements of the Performance:

- determine correct solutions to assorted fluid mechanics problems

2. Be familiar with terminology and circuit schematics

Potential Elements of the Performance:

- develop with calculations and sketches, basic hydraulic circuits using accepted symbols

3. Demonstrate knowledge of key components of hydraulic systems

Potential Elements of the Performance:

- identify hydraulic components and explain their function

4. Demonstrate knowledge of aircraft hydraulic systems

Potential Elements of the Performance:

- examine aircraft hydraulic schematics and manufacturers manuals

5. Understand basic hydraulic control systems

Potential Elements of the Performance:

- explain sequence of operation using electrical over hydraulic schematics

6. Apply trouble shooting skills

Potential Elements of the Performance:

- with schematics and simulated scenarios, identify causes and effects of hydraulic problems

**III. TOPICS:**

1. Introduction to Fluid statics, Fluid properties, Work & Power
2. Terms, symbols and circuits
3. Fluid power (hydraulic components)
4. Aircraft
  - Landing gear
  - Brakes
  - Flight surfaces
5. Controls
6. Troubleshooting

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

FLUID POWER WITH APPLICATIONS - ANTHONY ESPOSITO  
Edition Six

**V. EVALUATION PROCESS/GRADING SYSTEM:**

Final Grades - Tests 70% - Quizzes/labs/assignments/attendance 30%

Attendance – scheduled labs are mandatory

Tests – 4 tests are planned for the semester, one week notice will be given. 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.

Quizzes – Quizzes will be held without notice throughout the term. One purpose of the quiz is to encourage regular attendance. Students who are absent will be given a 'zero grade' for the missed quiz.

The following semester grades will be assigned to students in postsecondary courses:

<b>Grade</b>	<b><u>Definition</u></b>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00

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.

## VI. SPECIAL NOTES:

### Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Special Needs office. Visit Room E1101 or call Extension 493 so that support services can be arranged for you.

### Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

### Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

**VII. PRIOR LEARNING ASSESSMENT:**

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

**VIII. DIRECT CREDIT TRANSFERS:**

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.