

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY  
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: INTRODUCTORY SCIENCE

Code No.: SCI 150-3

Program: PULP AND PAPERMAKING OPERATIONS

Semester: SEMESTER I

Date: MARCH 1989

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New:

Revision:

APPROVED:

  
Chairperson

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Date

CALENDAR DESCRIPTION

INTRODUCTORY SCIENCE

SCI 150-3

COURSE NAME

COURSE NUMBER

PHILOSOPHY/GOALS ;

This course deals with the scientific fundamentals from the chemistry and physics disciplines that are the bases for understanding the technologies used in the pulp and paper industry. The course material will be split in approximately equal portions between chemistry and physics.

Chemical fundamentals to be covered will include the following: atomic theory, elements, chemical solutions, simple reactions, factors controlling reaction rates and balancing simple chemical equations. Fundamentals to be covered from the physics discipline will include concepts of mass, volume, density, specific gravity, pressure systems, levers, gears and pulleys, energy and work, hydraulic systems, electrical basics and light. %

The course will be based on theory and classroom and/or lab. Demonstrations will be used to reinforce the major concepts studied.

**METHOD OF ASSESSMENT:**

Students will be graded on the basis of their performance in four tests (two each for the chemistry and physics components) given at appropriate intervals during the semester.

Letter grades will be assigned according to the standard Sault College system. Students having a final overall cumulative percentage between 50 and 59% may be permitted to write a supplemental examination that will cover the material from the entire course.

TEXTBOOK(S) :

There has been no textbook assigned for this course at this time. However, there are several useful texts that could be used that will cover both the chemistry and physics aspects of the course.

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**OBJECTIVES :**

The overall educational objective of this course is that the student will be able to demonstrate knowledge of those chemical and physical concepts that are relevant to his or her further studies in pulp and paper. More specific objectives are as follows:

1. Demonstrate knowledge of and to be able to apply chemical concepts of atomic theory, solutions, reactions and equations.
2. Demonstrate knowledge and be able to apply physical concepts of mass, volume, density and specific gravity.
3. Demonstrate knowledge of and to apply physical concepts of energy, power, work and simple machines.
4. Demonstrate knowledge of electrical and light fundamentals.

**NATURE OF PRESENTATION;**

The course will be given for 3 hours per week using one single and one double period. In this way, two hours per week will be available for classroom/laboratory demonstrations to be used to reinforce theoretical concepts. It is planned that the double period coincides with a time when the chemistry laboratory is otherwise free so that it can be used for demonstrations.

**TOPICS COVERED:**

**WEEK**

**TOPIC**

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| 1. | -Introduction to course; why chemistry and physics are required for pulp and paper.<br>-Nature of matter<br>-Atomic theory |
| 2. | -Molecular theory<br>-Chemical elements<br>-Chemical radicals  |
| 3. | -Mixture and solutions<br>-Separation of parts of mixtures and solutions<br>-Test 1  |

WEEK	TOPIC
4.	-Chemical reactions -Acid-base reactions -Oxidation-reduction reactions
5.	-Oxidation-reduction reactions -Factors controlling reaction rates
6.	-Balancing chemical equations of reactions -Some industrial chemical problems
7.	-Some industrial chemical hazards -Test 2
8.	-Mass -Volume -Density
9.	-Specific gravity of solids and liquids -Concepts of pressure: solids, liquids and gases
10.	-Energy and work -Problems
11.	-Types of simple machines -Three types of levers
12.	-Gears and pulleys -Hydraulic systems -Test 3
13.	-Electricity -Power, current and resistance
14.	-Electromagnetic spectrum -Visible, infrared and ultraviolet spectra
15.	-Some industrial physics problems -Test 4