

SAOLT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: PULPING PROCESSES  
Code No.: PPE 152-5  
Program: PULP AND PAPERMAKING OPERATIONS  
Semester: SEMESTER I  
Date: MARCH 89  
Author: ADAM SUGDEN

New:

Revision:

APPROVED:

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Chairperson

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Date

CALENDAR DESCRIPTION

PULPING PROCESSES

PPE 152-5

COURSE NAME

COURSE NUMBER

**PHILOSOPHY/GOALS:**

This course provides the student with the basic knowledge of the most important mechanical, chemimechanical, semichemical and full chemical pulping processes in current use. Chemical recovery systems, where applicable, will be studied and particular attention will be given to energy requirements.

The major emphasis in this course will be the understanding of the process flows. The theory behind each process will be dealt with in less detail.

Upon successful completion of the course the student will be able to demonstrate a broad knowledge of the different pulping processes, their inherent advantages and disadvantages.

**METHOD OF ASSESSMENT;**

Students will be graded on the basis of their performance in three tests to be given at appropriate intervals during the semester.

Letter grades will be assigned according to the standard Sault College system. Those students having a cumulative percentage between 50 and 59% may be permitted to write a supplemental test covering material from the entire course.

**TEXTBOOK(S);**

Smook, G. Handbook for Pulp & Paper Technologists. Joint Textbook Committee of the Paper Industry, CPPA, Montreal, 1982.

**OBJECTIVES;**

The overall educational objective of this course is that the student will be able to demonstrate knowledge, at the process level, of all major pulping processes in current use. Further, the student will be able to demonstrate a working knowledge of the main underlying theories for mechanical and chemical pulping as well as those for chemical recovery processes.

More specific objectives to be achieved by the course are as follows:

1. Demonstrate knowledge of the theory of fibre separation during pulping processes.
2. Demonstrate knowledge of the major differences between mechanical and chemical pulping processes.
3. Demonstrate the ability to understand the "alphabet soup" of pulping processes, e.g. SGW, PGW, RMP, TMP, CTMP etc.
4. Demonstrate a knowledge of the specific equipment used for the production of mechanical pulps, e.g. grinders, stones, atmospheric and pressurized refiners.
5. Demonstrate a knowledge of the structure and operation of batch and continuous digesters.
6. Demonstrate knowledge of the kraft and some soluble-base bisulphite pulping processes.
7. Demonstrate a knowledge of chemical recovery systems for kraft and bisulphite processes.

**NATURE OF PRESENTATION:**

The course will be given for 4 hours per week using two single and one double period. The double period will be periodically used for the presentation of audio-visual instructional aids. Basically the course will be given in the form of lectures and class exercises. Assignments will be given to be completed out of class hours.

**TOPICS COVERED:**

**WEEK**

**TOPIC**

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|----|---|
| 1. | - Introduction to course<br>- All you ever wanted to know about pulping<br>- How fibres are separated from wood                                   |
| 2. | - Major differences between mechanical and chemical pulping processes   |
| 3. | - Understanding the "vegetable soup" of processes<br>- Stone groundwood and pressurized stone groundwood<br>- Process flow, controlling variables |

WEEK	TOPIC
4.	<ul style="list-style-type: none"><li>- Stones, grinders and the principles of grinding</li><li>- Test 1</li></ul>
5.	<ul style="list-style-type: none"><li>- Refiner mechanical pulp and thermomechanical pulp</li><li>- Process flows, additives</li><li>- Controlling variables</li></ul>
6.	<ul style="list-style-type: none"><li>- Disc refiners, plates and principles of refining</li></ul>
7.	<ul style="list-style-type: none"><li>- Properties and uses of mechanical pulping</li></ul>
8.	<ul style="list-style-type: none"><li>- Digesters, blow tanks, heat recovery</li><li>- Principles of cooking, variables involved</li></ul>
9.	<ul style="list-style-type: none"><li>- The bisulphite pulping process</li><li>- Process flow, chemicals, pulp properties</li><li>- Test 2</li></ul>
10.	<ul style="list-style-type: none"><li>- The kraft pulping process</li><li>- Reactions between chemicals and wood</li></ul>
11.	<ul style="list-style-type: none"><li>- Process flow, chemicals</li><li>- Pulp properties</li></ul>
12.	<ul style="list-style-type: none"><li>- Principles and operation of chemical recovery processes</li></ul>
13.	<ul style="list-style-type: none"><li>- Chemimechanical pulping processes, e.g. CTMP</li><li>- Equipment, process flow, chemical additives</li><li>- Pulp properties</li></ul>
14.	<ul style="list-style-type: none"><li>- Semicheical pulping processes, e.g. SCMP, NSSC</li><li>- Equipment, process flow, chemical additives</li></ul>
15.	<ul style="list-style-type: none"><li>-Pulping safety</li><li>-Review</li><li>-Test 3</li></ul>