

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY  
SAULT STE MARIE, ON



Sault College

COURSE OUTLINE

Course Title: PULP & PAPER INDUSTRY OVERVIEW

Code No.: PPE 150-3

Semester: 1

Program: PULP & PAPERMAKING OPERATIONS

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Date: AUG. 2001

Previous Outline Date: NOV. 1998

Approved: \_\_\_\_\_

Dean

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Date

Total Credits: 3

Prerequisite(s): none

Length of Course: 16 weeks

Total Credit Hours: 48

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*For additional information, please contact Kitty DeRosario, Dean, School of Trades & Technology Studies, (705) 759-2554, Ext. 642.*

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 COURSE NAME

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## **I. COURSE DESCRIPTION:**

This is a survey course designed to give the beginning student a broad understanding of the scope of the Ontario, Canadian and global pulp and paper industry. The size, socio-economic value and product range of the industry will be covered.

The basic technologies used in product manufacture also will be covered.

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

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

- 1) Indicate a knowledge of the size, importance and range of products made in the Ontario pulp and paper industry.

Potential Elements of the Performance:

- name four factors that caused the early increase in the demand for paper in Ontario
- give three reasons why early pulp mills were built near rivers
- name four factors that caused building booms in pulp mills in the 1930's and 1940's
- identify the difference between a pulp mill and an integrated pulp mill
- name and describe five major products made by the Ontario pulp & paper industry
- indicate how many people are employed in the pulp and paper industry in Ontario
- indicate the value of products exported by the pulp and paper industry

- 2) Indicate a working knowledge of the size, importance and location of pulp and paper production facilities in Ontario.

Potential Elements of the Performance:

- describe how pulp and/or paper mills are sized
- relate three uses for market kraft pulp
- indicate on a map of Ontario where at least three kraft pulp mills and three newsprint mills and three specialty paper mills are located
- describe how paper board is different from paper
- define the term "paper and paperboard converting"

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## II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE (Continued)

- 3) Indicate a working knowledge of the size, importance and location of pulp and paper production facilities in the rest of Canada.

Potential Elements of the Performance:

- show the number of pulp mills in each province of Canada
- explain why fine paper mills tend to be located in Ontario and Quebec
- explain why the larger size mills are in British Columbia
- discuss the socio-economic impact the industry has on Canadians

- 4) Indicate a knowledge of the important areas of the world that compete with Canadian markets for pulp & paper.

Potential Elements of the Performance:

- recite the world's approximate production of pulp and paper
- name four regions or countries in the world that have the highest pulp and paper productions levels
- indicate why the northern hemisphere has the highest level of pulp and paper production
- identify various grades of pulp and paper from standard letter codes
- describe the significance of per capita consumption of paper and paperboard

- 5) Indicate a knowledge of the raw materials used by the pulp and paper industry.

Potential Elements of the Performance:

- define the term fibrous
- explain how fibres in paper are held together
- explain when, where and why paper was invented
- indicate the differences between fibres from hardwood and softwood trees
- indicate the differences between pulps made by chemical and mechanical methods
- define "non-woody, plant fibres"
- name five non-woody, fibre sources
- explain what secondary fibres are
- describe how fibre properties can affect the physical properties of paper
- explain why non-fibrous raw materials are used in paper manufacture

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

- 6) Differentiate between the basic technologies used in the manufacture of pulp and paper.

Potential Elements of the Performance:

- indicate the main differences between mechanical and chemical pulping processes
- explain the differences between RMP and TMP processes
- convert given units of specific energy such as HPD/ODT to MJ/kg
- explain the main differences between semi chemical and chemi mechanical pulping processes
- explain three factors that control reactions in cooking
- explain the difference between sulphite and kraft pulping
- explain the differences between batch and continuous digesters
- discuss what takes place in the absorption tower of a sodium bisulphite pulp mill
- explain the reactions that occur in the slaker, causticizer and lime kiln
- explain the difference between coarse and fine screening
- discuss what happens during various bleaching stages
- explain the difference between screening and cleaning

- 7) Indicate a knowledge of the basic technologies used in the manufacture of paper.

Potential Elements of the Performance:

- discuss what conditions must be met in order to get effective fibre to fibre bond
- discuss refining in papermaking
- explain what Canadian standard freeness is
- discuss stock proportioning and process control
- tell what the purpose is of a rectifier roll
- discuss the difference between stock being pushed or pulled onto a paper machine wire
- explain the purpose of a foil
- explain the functions of a press felt, a pocket dryer and a calender
- list two advantages of a twin-wire machine

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

- 8) Explain the environmental impact of the pulp and paper industry.

Potential Elements of the Performance:

- list 5 circumstances that lead to waste being emitted by the pulp and paper industry
- explain photosynthesis
- explain why oxygen depletion from water is important to aquatic life
- define BOD
- explain why chlorinated wastes are dangerous to the environment
- list four solid wastes coming from a pulp mill
- explain the green house effect
- explain primary treatment and secondary treatment
- differentiate between aerobic and anaerobic treatment
- explain a control order

## **III. TOPICS:**

- 1) An overview of the Ontario Pulp & Paper Industry
- 2) Size, location and products of the Ontario Pulp & Paper Industry
- 3) Size, location and products of the Canadian Pulp & Paper Industry
- 4) Global competition in pulp and paper
- 5) Raw materials used by the Pulp & Paper Industry
- 6) Basic technologies used to manufacture pulp
- 7) Basic technologies used to manufacture paper
- 8) Environmental aspects of the Pulp & Paper Industry

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

Sugden, A., Course Manual for PPE 150, Sault College of Applied Arts & Technology, Sault Ste. Marie, 1989.

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

A final grade in this course will be based on the results of three tests weighted equally. For testing purposes, the course will be divided as follows:

Test No. 1 on Module 1

Test No. 2 on Module 2

Test No. 3 on Modules 3 and 4

The grading system will be as follows:

A+ = 90-100      A = 80-89      B = 70-79      C = 60-69      R = less than 60

Students with a final grade between 55-59 will be allowed to write a supplemental exam.

## **VI. SPECIAL NOTES:**

- Special Needs  
If you are a student with special needs (eg. physical limitations, visual impairments, hearing impairments, learning disabilities), you are encouraged to discuss required accommodations with the instructor and/or contact the Special Needs Office, Room E1204, Ext. 493, 717, 491 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 post-secondary institutions.
- Disclaimer for Meeting the Needs of the Learners
- Substitute Course Information is available at the Registrar's Office.
- Any Other Special Notes appropriate to your course.

## **VII. PRIOR LEARNING ASSESSMENT**

Students who wish to apply for advanced credit in the course should consult the instructor.