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

COURSE OUTLINE

Course Title; PULP & PAPER INDUSTRY OVERVIEW

Code No.: PPE 150-2 **Semester: 1**

Program: PULP & PAPERMAKING OPERATIONS

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Date: NOV. 1998 **Previous Outline Date: AUG. 1990**

Approved: ^ / 2 f ? f / / <&&< <f /fa* /7/f^**
Dean **Date**

Total Credits: 2 **Prerequisite(s): none**
Length of Course: 16 weeks **Total Credit Hours: 32**

PULP AND PAPER INDUSTRY OVERVIEW PPE 150-2

COURSE NAME COURSE NUMBER

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.

H. 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"

H. 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

H. 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

H. 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

m. 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.

V. EVALUATION PROCESS/GRADING SYSTEM

A final grade in this course will be based on the results of three tests weighted equally. 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 El204, 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.

VH. PRIOR LEARNING ASSESSMENT

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