

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 discussed. 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 terms "paper and paperboard converting"

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

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 chemical 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 calendar
List two advantages of a twin-wire machine

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

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. and Bethune, J., Study Guide for PPE 150, Pulp and Paper Industry Overview.” Sault College of Applied Arts and Technology. 2000

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 following semester grades will be assigned to students in all credit courses:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 - 100%	4.00
A	80 - 89%	4.00
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 - 59%	1.00
F (Fail)	49% or below	0.00
S	Satisfactory achievement in field/clinical placement or non-graded subject areas.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject areas.	
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.	

Under extreme circumstances, students receiving a final grade of 45-49% may be permitted to write a supplementary exam for a maximum grade of D provided they receive a minimum grade of at least 60% on the average of the other two tests.

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 instructor and/or the Special Needs office. Visit Room E1204 or call Extension 493, 717, or 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 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.