

Revised by
A. Sudden
Feb 1987

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: PULP TECHNOLOGY I
Code No.: PPE 230-4
Program: PULP AND PAPER ENGINEERING TECHNOLOGY
Semester: II
Date: JUNE, 1986
Author: J. KORREY

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New:

Revision: X

APPROVED:


Chairperson

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CALENDAR DESCRIPTION

PULP TECHNOLOGY 1

PPE 230-4

Course Name

Course Number

PHILOSOPHY/GOALS: Pulp Technology I is an introductory course on the theory of the Kraft pulping process. This includes a study of pulping terms, digestion, heat and chemical recovery, equipment, balances, bleaching and control tests.

METHOD OF ASSESSMENT (GRADING METHOD): Evaluation will be made on the basis of four tests and a seminar topic to be researched and presented to other members of the class.

Four tests x 20 marks = 80 marks

Assignments = 10 marks

Seminar Report = 20 marks

Seminar Presentation = 10 marks

120 marks

TEXT(S):

Smook, G. A., "Handbook for Pulp and Paper Technologists",
Joint textbook committee of the Pulp and Paper Industry

REFERENCES:

The Pulping of Wood ^ Pulp and Paper Manufacture Series,
McGraw-Hill, Volume 1, 1969.

Britt, Kenneth W., "Handbook of Pulp and Paper Technology",
Reinhold Publishing Co., N.Y. 1964.

Rydholm, Sven A., "Pulping Processes", Intersciences Publishers,
division of John Wiley and Sons, Toronto, 1965.

Casey, James P., "Pulp and Paper Chemistry and Chemical
Technology", 3rd edition, Wiley Interscience, Toronto, 1981.

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THE CHEMICAL COMPOSITION OF WOOD

1. INTRODUCTION
2. POLYSACCHARIDES
 - a) cellulose
 - b) hemicellulose
 - c) summary
3. LIGNIN
4. EXTRACTIVES
5. INORGANICS

II INTRODUCTION TO PULPING (General Principles of Pulping)

1. PULPING PROCESSES
 - a) mechanical - groundwood
- T.M.P.
 - b) chemi-thermomechanical (C.T.M.P.)
 - c) semi-chemical
 - d) sulphite

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TEST #1**III ALKALINE PULPING - KRAFT**

1. HISTORICAL BACKGROUND
2. DESCRIPTION OF THE PROCESS
3. THE CHEMISTRY OF KRAFT PULPING
 - a) the composition of pulping liquor
4. VARIABLES IN ALKALINE PULPING
 - a) wood, species and conditions
 - b) alkali charge
 - c) composition of cooking liquor
 - d) temperature of digestion
 - e) time of digestion
 - f) balances - heat, material

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5. CONTINUOUS COOKING
6. CONTROL METHODS

TEST #2

IV ALKALINE RECOVERY AND BY-PRODUCTS

1. INTRODUCTION AND IMPORTANCE
2. EVAPORATION OF BLACK LIQUOR
3. RECOVERY FURNACE
4. PREPARATION OF COOKING LIQUOR
5. TALL OIL RECOVERY
6. BALANCES

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- a) material - cooking and washing
 - causticizing
 - lime kiln
 - b) heat - recovery furnace
 - lime kiln
 - c) water

TEST #3

V SULPHITE PULPING

1. INTRODUCTION AND ORIGIN OF THE PROCESS
2. OUTLINE OF THE SULPHITE PROCESS
3. CHEMISTRY OF SULPHITE PULPING
4. PREPARATION OF COOKING-ACID
5. PREPARATION OF SULPHUR DIOXIDE
6. SULPHUR BURNERS
7. GAS COOLERS

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8. ABSORPTION SYSTEMS
9. HEAT RECOVERY AND SULPHUR DIOXIDE
10. GENERAL CONDITIONS
11. CHEMICAL TESTS
12. BATCH DIGESTERS
13. COOKING PROCEDURE - BATCH OPERATION
 - filling the digester
 - cooking the digester
 - circulation of acid
 - steaming
 - relief
 - end point of cook
 - emptying the digester (blowing)
14. SODIUM BASE SULPHITE PULPING
15. MULTISTAGE PROCESSES
16. AMMONIUM BISULPHITE PULPS
17. MAGNESIUM-BASE SULPHITE PULPING
18. CONTINUOUS SULPHITE PULPING
19. RECOVERY SYSTEMS

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TEST #4

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