DOC.#601

SAOLT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: INTRODUCTION TO PULP TESTING

CODE NO. PPE 155-2 **SEMESTER**

PROGRAM: PULP AND PAPERMAKING OPERATIONS (Distance Education Only)

AUTHOR: ADAM SUGDEN

DATE: MAY 1990 **PREVIOUS OUTLINE DATED:** APRIL 1990

APPROVED: _____ **DATE** 7

DEAN

INTRODOCTION TO PULP TESTING **PPE 155-2**

COURSE NAME **COURSE NUMBER**

TOTAL CREDIT HOURS: 32

PREREQUISITE: NONE

I. PHILOSOPHY/GOALS:

This is a laboratory course for Pulp and Papermaking Operations students in the distance education format. The course is given at Sault College or at a remote location such as a mill or another community college.

The course is designed to help students develop some basic laboratory skills commensurate with those an entry-level employee may be required to use. Included in this part are tests to determine consistency/ freeness, permanganate number, pulping liquor and leach liquor strengths. Additionally, the students will be taught how to do some basic tests on paper. Actual laboratory experiments performed may vary depending on the interests of the group of students.

II. STUDENT PERFORMANCE OBJECTIVES:

The overall educational objective of this course is that the student will be able to successfully perform a number of standard industry tests to the desired level of accuracy. By doing so, the student will learn the importance of careful work, accuracy and clear reporting of results.

Upon successful completion of this course the student will be able to:

1. Determine mass, volume, density and specific gravity of solids and liquids.

2. Demonstrate an ability to accurately perform a variety of physical tests on pulp and paper.

3. Demonstrate an ability to accurately perform a variety of chemical tests on pulp and process liquors.

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III. TOPICS TO BE COVERED:

(NOTE: Lab numbers (A) and (B) indicate alternate labs depending on student needs.)

DAY **TOPIC**

1. LAB **1. INTRODUCTORY LAB SKILLS**

Mass, volume, density and specific gravity of solids and liquids.

2. LAB 2. **DETERMINATION OF MOISTURE-FREE MASS OF PULP**

- Percent solids and consistency

LAB 3A. **SODIUM SULPHITE COOKING LIQUOR STRENGTH**

Liquor strength tests for sulphite, NSSC, CTMP and SCMP pulping processes.

LAB 3B. **FREENESS OF DIFFERENT PULPS**

Canadian Standard Freeness measurements on a variety of pulps.

3. LAB **4. ANALYSES OF KRAFT PULPING LIQUORS**

Effective and active alkalinity and sulphidity of kraft white and green liquors.

LAB 5. **RAW PULP TESTING BY KAPPA AND PERMANGANATE NUMBERS**

Use of these two comparable tests to measure degree of cooking of kraft and sulphite pulps.

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III. TOPICS TO BE COVERED (Continued):

(NOTE: Lab numbers (A) and (B) indicate alternate labs depending on student needs.)

DAY	**TOPIC**
4.	LAB **6. STRENGTH OF CHLORINE BLEACH LIQUORS** Available chlorine in chlorine water and sodium hypochlorite bleach liquors.
	LAB 7A. **STRENGTH PROPERTIES OF COMMERCIAL PAPER** Basic physical and strength properties of machine-made papers
	LAB 7B. **MAKING PAPER HANDSHEETS** Preparation of paper sheets for testing Testing the handsheets
5.	LAB 8. **SURFACE AND OPTICAL PROPERTIES OF PAPER** Smoothness, absorbtivity, brightness, capacity and colour of paper.
	LAB TEST. General test of skills and knowledge gained from lab program.

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IV. EVALUATION METHODS: (INCLUDES ASSIGNMENTS, ATTENDANCE REQUIREMENTS ETC.)

The final grade for this course will be based on the student's performance on 7 lab exercises and one general lab test. Each lab is worth 10% and the test is worth 30%.

Letter grades for the course are assigned based on a final accumulated percentage mark. Letter grades are as follows:

A+, 90-100%; A, 80-89%; B,70-79%; C,60-69%, R<60%

Students who have completed all labs and the test and who have a final percentage mark of 50-59% may be permitted to write a supplemental lab test for a passing "C" grade.

V. REQUIRED STUDENT RESOURCES

TEXTBOOK(S):

A prepared text, "A Laboratory Manual for PPE-155: Introduction to Pulp Testing" will be available from the College Bookstore.

VI. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY BOOK SECTION:

In addition, a reference book is recommended for this and other courses. This book is:

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

VII. SPECIAL NOTES

NATURE OF PRESENTATION

Distance Education Students:

The students will use the prepared lab manual for all lab exercises. Each lab will be completed and turned in for marking. This course will be completed at Sault College or an alternate location during a selected one-week period.