

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

PAPER FINISHING

PPE 365-4

SEMESTER:

PULP AND PAPER ENGINEERING TECHNOLOGY

ADAM SUGDEN

JULY 1990

NOVEMBER 1984

PREVIOUS OUTLINE DATED:

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COURSE NAME

CODE NUMBER

TOTAL CREDIT HOURS: 16

PREREQUISITES(S): PPE340

I. PHILOSOPHY/GOALS:

This course deals with the final steps in the manufacture of paper and includes aspects of size press operations, on-manufacture coating, calendering, reeling and roll winding. Paper machine drive systems and controls will be studied as will other operations such as re-winding, slitting, sheeting, wrapping and storage. Aspects of quality control of the paper and specific tests used to provide this information will be dealt with. State-of-the-art on-line monitoring and control systems for moisture, basis weight and caliper will be studied.

II. STUDENT PERFORMANCE OBJECTIVES:

On completion of the course, the student will be conversant with all the various aspects of the paper finishing operations in a paper mill. The student will be able to describe and compare different techniques for calendering, will be able to analyze the different variables involved in calendering and will understand the different components of the reeling stage of papermaking. Sizing and coating systems will be studied and compared in terms of economy and effectiveness. The student will be able to describe the types of on-line apparatus used and their operating principles.

Various calender stack combinations will be studied such as on-line and off-line calenders and supercalenders. Smoothness measuring devices such as Bendtsen, Sheefield, Parker Print-Surf will be discussed and compared. Printing press requirements are compared.

Paper machine winders are discussed. The fundamentals of tension Nip and Torque are developed. The student will be able to plot winder time vs. paper velocity time cycles for a variety of winder situations.

This course also covers in detail the various related operations involved in winding, slitting, sheeting, wrapping and storage will all be evaluated. The student will be able to describe these processes as well as analyze their importance in the whole papermaking operation. Aspects of quality control of papermaking will be studied and the student will be able to recount the underlying principles and importance of each of several examples.

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III. TOPICS TO BE COVERED:

The various topics covered in this course are detailed in the table below:

TOPIC NUMBER	TOPIC
1.	INTRODUCTION <ul style="list-style-type: none">- Scope of the course- Review of paper manufacturing to the dryer exit- Reasons for finishing paper
2.	CALENDERING <ul style="list-style-type: none">- Its effect on paper, the theory of calendering- Calender variables versus sheet variables<ul style="list-style-type: none">-temperature-pressure-moisture content-controls- Calender configurations and equipment- Power consumption and costs
3.	ON-LINE CONTROL EQUIPMENT <ul style="list-style-type: none">- Moisture profile- Basis weight- Caliper (thickness)
4.	REELING <ul style="list-style-type: none">- Equipment involved- Controls and Tests- Effects of sheet variables on roll formation

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III. TOPICS TO BE COVERED: (cont'd)

TOPIC NUMBER TOPIC

5. SIZING AND COATING SYSTEMS

- Size press operations and design
- On-machine coating
- Off-machine coating
- Coating requirements
- Control systems and tests
- Effect of sheet properties on sizing and coating

PAPER MACHINE DRIVE SYSTEMS

- Mechanical drives
- Electric sectional drives
- Control systems
- Draws

7. WINDING, SLITTING AND SHEETING

- Customer requirements(Finish vs. Printing Presses)
- Equipment used
- The role of cores
- Sheet sizes
- Control mechanisms

WRAPPING AND STORAGE

- Equipment design and operation
- Processes used
- Conditions of storage
- Warehousing and inventory control
- Shipping and computer networks for customer service

QUALITY CONTROL

- Specifications
- Physical and optical testing
- Complaints
- Settlements of claims

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IV. EVALUATION METHODS:

Students will be graded on the basis of their performance on three tests of which each one is worth one third of the final grade for the course. Letter grades will be assigned as follows:

A+ = 90% or higher	A = 80-89%	B = 70-79%
	C = 60-69%	R = 59% or less

Students having a final standing of "R" and who have a course average of at least 55% will be permitted to write a supplemental test.

V. REQUIRED STUDENT RESOURCES:

Unfortunately, at the time of writing, there does not exist a suitable textbook for this course. However, there are a number of extremely useful reference books available and a list of these will be available at the beginning of the semester.

VI. SPECIAL NOTES:

NATURE OF PRESENTATION:

This course will be given three 1-hour periods per week and will be based on theory only. It is hoped that, when feasible, outside speakers will be invited to participate in this course. It is planned that one field trip will be made early in the semester in order to ensure that all students have a common basis of understanding of the processes involved.