

**Fond du Lac Tribal and Community College
COURSE OUTLINE FORM**

03/19/19

Please return this form to the college vice president of academic affairs and the chairperson of the Academic Affairs and Standards Council (AASC)

1. Prepared by: _____
2. Date submitted: _____
3. Date approved: 02/27/2020 Date revised _____
4. Department/discipline: Engineering
5. Department(s) endorsement(s): _____
(Signatures of the person(s) providing the endorsement are required.)
6. Course Title: Introduction to Pulp & Paper Technologies
Abbreviated course title for Transcripts (25 characters or less): _____
7. Course Designator: ENGR 8. Course Level: 1100
9. Number of Credits: Lecture 3 Lab _____
10. Control Number (on site) _____ Control Number (online) 25

11. Catalog/Course description:

This course provides an introductory overview of the technology of pulp and paper manufacturing. The course provides stepwise descriptions of the manufacturing process, from harvesting trees to fiber production, fiber properties, papermaking, coating, sizing, and other technologies. Terminology and key parameters are introduced. This course is an ideal introduction to the pulp and paper industry for students seeking entry-level employment in the industry or for those considering an engineering degree in bioproduct manufacturing or paper science.

12. Course prerequisite(s) or co-requisite(s): Accuplacer scores/ Other courses

Prerequisite(s): High School Chemistry

Co-requisite:

13. **Course Materials** (Recommended course materials and resources. List all that apply, e.g. textbooks, workbooks, study guides, lab manuals, videos, guest lecturers).

Downloadable course material will be available on the D2L site. The *Handbook for Pulp and Paper Technologists*, 4th edition, by Gary Smook (TAPPI press; ISBN 978-1-59510-245-4), is the primary industry reference and will be available in the FDLTCC library.

14. **Course Content** (Provide an outline of major topics covered in course)

1. Wood (biomass) Procurement and Chip Manufacturing
Introduction of different tree harvesting and processing methods, including different debarkers and chippers.
2. Wood Properties and Fiber Characteristics
Differences between softwood and hardwoods and how this translated to property differences for papermaking processes
3. Pulping Processes
Introduction to mechanical, chemical, and semichemical pulping

4. Bleaching Technology
Differences between bleaching of chemical and mechanical pulps and discussion of typical bleaching sequences for both options
5. Chemical Recovery
Importance of chemical recovery in chemical pulping, cooking chemical recovery, and energy production
6. Stock Preparation
Refining and beating and influence on paper properties. Stuffbox, white water return, fillers, and wet end chemicals
7. Paper Machine Operations
Paper machine options, dewatering, pressing, and drying
8. Coating and Calendering
Different coater options, sizing, and calendar stacks
9. Converting and Finishing
Sheet finishing and converting
10. Pulp and Paper Properties and Characterization
Typical Pulp and Paper Properties tested and what they tell us
11. Environmental Treatment Technologies:
Water and Waste Water Treatment and Air Pollution Treatment options
12. Process Instrumentation and Controls
Sensors, measurements
13. Quality and Statistical Process Control
Simple statistical consideration, quality control

15. Learning Goals, Outcomes, and Assessment

At FDLTCC we have 4 Competencies Across the Curriculum (CAC) areas. They are as follows:

- A. Information Literacy (the ability to use print and/or non-print tools effectively for the discovery, acquisition, and evaluation of information)
- B. Ability to Communicate (the ability to listen, read, comprehend, and/or deliver information in a variety of formats.)
- C. Problem Solving (the ability to conceptualize, apply, analyze, synthesize, and/or evaluate information to formulate and solve problems.)
- D. Culture (knowledge of Anishinaabe traditions and culture, knowledge of one's own traditions and culture, knowledge of others' traditions and cultures, culture of work, culture of academic disciplines and/or respect for global diversity.)

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

Learning Outcomes	Competencies (CAC)	Cultural Standards
Demonstrate correct usage of terminology used in Pulp and Paper industry.	A, B	
Describe and provide examples of the processes and products of the pulp and paper industry.	B, C	
Demonstrate effective communication with personnel in the pulp and paper industry.	B	
Summarize and describe the different sections of the	A, B, C	

pulp and paper process to understand the overall picture.		
Demonstrate mastery (70% performance threshold) of the core concepts in each unit.	A, B, C	

WINHEC Cultural Standards:

1. **GIKENDAASOWIN – *Knowing knowledge*:** To develop human beings who value knowledge, learning, and critical thinking and are able to effectively use the language, knowledge, and skills central to an Ojibwe-Anishinaabe way of knowing.
2. **GWAYAKWAADIZIWIN – *Living a balanced way*:** To develop balanced human beings who are reflective, informed learners who understand the interrelatedness of human society and the natural environment, recognize the importance of living in harmony with creation, and are able to apply a systems approach to understanding and deciding on a course of action.
3. **ZOONGIDE'EWIN – *Strong hearted*:** To increase the students' capacity to live and walk with a strong heart, humble and open to new ideas and courageous enough to confront the accepted truths of history and society.
4. **AANGWAAMIZIWIN – *Diligence and caution*:** To develop students' capacity to proceed carefully, after identifying, discussing, and reflecting on the logical and ethical dimensions of political, social, and personal life.
5. **DEBWEWIN – *Honesty and integrity*:** To increase students' capacity to think and act with honesty and integrity as they understand and face the realities of increasingly interdependent nations and people
6. **ZAAGI' IDIWIN – *Loving and Caring*:** To encourage students' acceptance of the diversity within their school, community, and environment by developing healthy, caring relationships built on respect for all.
7. **ZHAWENINDIWIN – *Compassion*:** To expand students' knowledge of the human condition and human cultures and the importance of compassion especially in relation to behavior, ideas, and values expressed in the works of human imagination and thought.

16. **Minnesota Transfer Curriculum (MnTC):** List which goal area(s) – up to two – this course fulfills.

See www.mntransfer.org

Goal Area(s): _____

Provide the specific learning outcomes as listed on the mntransfer.org website that pertain to this course.

17. Are there any additional licensing/certification requirements involved?

_____ Yes _____ No

Provide the required documentation to show course meets required licensing/certification standards.

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