MINNESOTA WEST COMMUNITY & TECHNICAL COLLEGE
COURSE OUTLINE

DEPT: Renewable Energy Technology    COURSE NO. RNEW 1101

NUMBER OF CREDITS: 2    COURSE TITLE: Ethanol Process Fundamentals

CATALOG DESCRIPTION:

This course, offered in the spring semester, will cover the history, rational, and overall fundamental process of ethanol production. A Process Flow Diagram (PFD) of a typical dry mill ethanol plant will be used to examine the sequence of operation, including residence time, pressures, and temperatures seen in various stages of production. This course will explain the rational for feedstock and additives used in ethanol processing as well as product and co-product production and use.

AUDIENCE:  
Ethanol process operators, managers and lab personnel

PREREQUISITES OR NECESSARY ENTRY SKILLS/KNOWLEDGE:

A basic understanding of biology, chemistry, and mechanical fundamentals

LENGTH OF COURSE: 2 lecture credits

THIS COURSE IS USUALLY OFFERED:
Every other year    fall    spring X    summer    undetermined

Four goals emphasized in this course are:

1) ACADEMIC CONTENT: The student will acquire an understanding of the dry mill ethanol process, a brief history of ethanol, and the social, economic, and environmental benefits of ethanol production.

2) THINKING SKILLS: The student will understand the information required to apply the components and concepts discussed in this course.

3) COMMUNICATIONS SKILLS: The student will demonstrate written communication skills.

4) HUMAN DIVERSITY: The student will gain self-awareness regarding the feelings towards people regardless of culture, values or socioeconomic status.
TOPICS TO BE COVERED:

1. Introduction to the Ethanol Industry
2. Milling and Mixing
3. Cook and Liquefaction
4. Fermentation
5. Distillation
6. Dehydration
7. Evaporation
8. Drying
9. Thermal Oxidation
10. Alternative Feedstock

LEARNING/TEACHING TECHNIQUES used in the course are:

___Collaborative Learning    X Problem Solving
X Student Presentations   X Interactive Lectures
___Creative Projects       ___Individual Coaching
X Lecture                  X Films/Videos/Slides
X Demonstrations           ___Other (describe below)
X Lab

ASSIGNMENTS AND ASSESSMENTS FOR THIS CLASS INCLUDE:

X Reading            X Tests            X Individual Projects
___Oral Presentations X Worksheets       ___Collaborative Projects
X Textbook Problems  ___Papers           ___Portfolio
___Group Problems    ___Term Paper
___Other (describe below)

EXPECTED STUDENT LEARNING OUTCOMES:

The student will understand the fundamental concepts of ethanol production in a modern dry mill ethanol facility. This course is a prerequisite for Process Optimization, which will utilize the Ethanol Process Simulator.

The information in this course outline is subject to revision

Veteran Services: Minnesota West is dedicated to assisting veterans and eligible family members in achieving their educational goals efficiently. Active duty and reserve/guard military members should advise their instructor of all regularly scheduled military appointments and duties that conflict with scheduled course requirements. Instructors will make every effort to work with the student to identify adjusted timelines. If you are a veteran, please contact the Minnesota West Veterans Service Office.

To receive reasonable accommodations for a documented disability, please contact the campus Student Services Advisor or campus Disability Coordinator as arrangements must be made in advance. In addition, students are encouraged to notify their instructor.

This document is available in alternative formats to individuals with disabilities by contacting the Student Services Advisor or by calling 800-658-2330 or Minnesota Relay Service at 800-627-3529 or by using your preferred relay service.

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