

# MINNESOTA WEST COMMUNITY & TECHNICAL COLLEGE

## COURSE OUTLINE

DEPT. RNEW

COURSE NUMBER: 1101

NUMBER OF CREDITS: 2

Lecture: 2 Lab: 0 OJT 0

### Course Title:

Ethanol Process Fundamentals

### Catalog Description:

Ethanol Process Fundamentals covers the history, rationale, 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 rationale for feedstock and additives used in ethanol processing as well as product and co-product production and use.

### Prerequisites or Necessary Entry Skills/Knowledge:

None

### FULFILLS MN TRANSFER CURRICULUM AREA(S) (*Leave blank if not applicable*)

- Goal 1: Communication: By meeting the following competencies:
- Goal 2: Critical Thinking: By meeting the following competencies:
- Goal 3: Natural Sciences: By meeting the following competencies:
- Goal 4: Mathematics/Logical Reasoning: By meeting the following competencies:
- Goal 5: History and the Social and Behavioral Sciences: By meeting the following competencies:
- Goal 6: The Humanities and Fine Arts: By meeting the following competencies:
- Goal 7: Human Diversity: By meeting the following competencies:
- Goal 8: Global Perspective: By meeting the following competencies:
- Goal 9: Ethical and Civic Responsibility: By meeting the following competencies:
- Goal 10: People and the Environment: By meeting the following competencies:

### Topics to be Covered

Introduction to the ethanol industry

Milling and mixing

Cook and liquefaction

Fermentation

Distillation

Dehydration

Evaporation

Drying
Thermal oxidation
Alternative feedstock

<b>Student Learning Outcomes</b>
Explain the dry mill ethanol process
Discuss the history of ethanol and the social, economic and environmental benefits of ethanol production
Describe the sequence of operation, including residence time, pressures and temperatures in various stages of production.
Explain the rationale for feedstock and additives used in ethanol processing
Describe product and co-product production and use.

**Is this course part of a transfer pathway: Yes  No**   
**\*If yes, please list the competencies below**

Revised Date: 1/1/2022