

# MINNESOTA WEST COMMUNITY & TECHNICAL COLLEGE

## COURSE OUTLINE

DEPT. RNEW

COURSE NUMBER: 1300

NUMBER OF CREDITS: 3

Lecture: 3 Lab: 0 OJT: 0

### Course Title:

Introduction to Traditional and Renewable Energy

### Catalog Description:

Introduction to Traditional and Renewable Energy introduces students to various forms of energy stemming from both renewable and non-renewable sources. Students will study many sources of energy including solar thermal power, solar photovoltaics, bioenergy, hydroelectricity, tidal power, wind energy, wave energy, geothermal energy and fossil fuels. The First Law of Thermodynamics is studied along with conversion and efficiency of various forms of energy. The economics, potential and environmental impact will be covered for each topic.

### 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

Force, energy and power relationships

Energy conservation: The First Law of Thermodynamics

Conversion and efficiency

Solar Thermal Energy

Solar Photovoltaics

Bioenergy

Hydroelectricity
Tidal Power
Wind Energy
Wave Energy
Geothermal Energy
Natural Gas
Coal
Energy integration
Career opportunities/exploration

Student Learning Outcomes	
Discuss fundamentals and basic principles of operating and maintaining wind, solar, and fossil fuel power generation and distribution facilities.	
Discuss basic principles of operating and maintaining biofuel plants.	
Discuss basic principles of operating and maintaining natural gas pipelines.	
Identify career opportunities as they relate to the various energy industries.	
Identify sources used to provide energy in today's society.	
Identify major components of various energy systems and the technologies associated with them.	
Discuss economic, potential impact and environmental impact of various energy systems.	
Discuss the issues relating to energy integration.	

<b>Is this course part of a transfer pathway:</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<i>*If yes, please list the competencies below</i>

Revised Date: 3/29/2022