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.

**Is this course part of a transfer pathway:** Yes ☐ No ☒

*If yes, please list the competencies below

Revised Date:  3/29/2022