Course Title: Introduction to Traditional and Renewable Energy

Catalog Description:
Designed to introduce 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)
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

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

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

Revised Date: August. 2020