Faculty members are required to have the outline submitted to the Academic Affairs Office. The course outline is the form used for approval of new courses by the Academic Affairs and Standards Council.

**DEPT. RNEW**

**COURSE NUMBER:** 1102

**NUMBER OF CREDITS:** 2

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**Course Title:**

Biodiesel Process Fundamentals

**Catalog Description:**

Biodiesel Process Fundamentals provides detailed information regarding the overall fundamental process of biodiesel production. The course will include a review of biodiesel chemistry, process engineering, post reaction processing, fuel specification and properties, feedstock preparation, treatment and recovery of side streams, fuel transportation storage and general plant operations.

**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

- History of biodiesel
- Define the common terminology
- Define the chemistry relating to biodiesel production:
  - Reactants: triglycerides, fatty acids, alcohol, catalyst
  - Products: biodiesel, water, crude glycerin, soap
- Reaction trouble shooting
- Describe the process engineering
- Fuel properties
  - Comparison to petroleum diesel
- Fuel specifications according to ASTM and European standards
- Introduction to BQ-9000
- Social, economic, and environmental benefits and concerns of biodiesel production
- Globalization

### Student Learning Outcomes

1. Explain biodiesel processing and the chemistry that supports the production technology.
2. Discuss process parameters.
3. Identify fuel properties.
4. Differentiate between biodiesel and petroleum diesel properties.
5. Describe fuel specifications.
6. Discuss the social, economic, and environmental benefits and concerns associated with biodiesel production.

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

Revised Date: January 2021