Faculty is 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. Biofuels Technology COURSE NUMBER: RNEW 1175

NUMBER OF CREDITS: 2

COURSE TITLE: Industrial Water Treatment

CATALOG DESCRIPTION: This course covers the basic understanding of primary water treatment systems and chlorination. Students will be able to describe problems that can be caused by impurities in the water and explain how they can be removed physically and chemically. This course will also familiarize students with the basic concepts of treating industrial wastewater so it can be reused or discharged into the environment.

AUDIENCE: This course is designed for any individual that would like to increase their knowledge about industrial water treatment.

FULFILLS MN TRANSFER CURRICULUM AREA(S) *(Leave blank if not applicable)*
Area: by meeting the following competencies:
Area: by meeting the following competencies:
Area: by meeting the following competencies:

PREREQUISITES OR NECESSARY ENTRY SKILLS/KNOWLEDGE: none

LENGTH OF COURSE: One semester

THIS COURSE IS USUALLY OFFERED:
Every other year ☐ fall ☐ spring X summer ☐ undetermined ☐

Four goals are emphasized in course at Minnesota West Community & Technical College:

1) ACADEMIC CONTENT: The academic objectives of this course are:
   a. Students will gain a foundational knowledge about industrial water treatment systems.
   b. Students will increase their knowledge about the effects that water treatment systems can have on production and discharge.
   c. Students will understand the effects of improper management and control on industrial water treatment systems.
2) THINKING SKILLS: This course will help students improve the effectiveness of their thinking skills through:
   a. Students will understand the information required to apply the theory and concepts discussed in this course.
   b. Written explanation of chapter topics

3) COMMUNICATIONS SKILLS: This course will help students improve their oral and written communication skills through:
   a. Interactive electronic classroom discussion
   b. Electronic communications with faculty and fellow students

4) HUMAN DIVERSITY: This course will help students recognize, understand, and appreciate human diversity through:
   a. Respectable participation in on-line classroom discussions
   b. Working on a team project in a cyber classroom, and recognizing the challenges that accompany such a task.

TOPICS TO BE COVERED:
The chemistry of water, scale, corrosion, microbial fouling, water treatment methods, steam generation and condensation, boiler systems, water cooling systems, wastewater treatment systems, basic analytical procedures, monitoring and control systems, and chemicals and safety.

LIST OF EXPECTED COURSE OUTCOMES:
Upon successful completion of this course, students will:

1. Understand the chemical and physical properties associated with water.

2. Understand the effects that scale, corrosion, and microbial fouling can have on water treatment systems.

3. Understand the role of steam generation and cooling systems in water treatment programs.

4. Identify and describe the social, economic, and environmental benefits of proper industrial water treatment.

LEARNING/TEACHING TECHNIQUES used in the course are:

X Collaborative Learning
X Problem Solving
☐ Student Presentations
☐ Creative Projects
☐ Lecture
☐ Demonstrations
☐ Lab
X Films/Videos/Slides
☐ Other (describe below)
ASSIGNMENTS AND ASSESSMENTS FOR THIS CLASS INCLUDE:

X Reading X Tests X Individual Projects
☐ Oral Presentations X Worksheets X Collaborative Projects
X Textbook Problems X Papers ☐ Portfolio
☐ Group Problems ☐ Term Paper
☐ Other (describe below)

EXPECTED STUDENT LEARNING OUTCOMES:
Upon successful completion of this course, students will:

1. Demonstrate their understanding of the chemical and physical properties associated with water.
2. Demonstrate their knowledge about the effects that scale, corrosion, and microbial fouling can have on water treatment systems.
3. Understand the role of steam generation and cooling systems in water treatment programs.
4. Identify and describe the social, economic, and environmental benefits of proper industrial water treatment.

The information in this course outline is subject to revision

Veteran Services: Minnesota West is dedicated to assisting veterans and eligible family members in achieving their educational goals efficiently. Active duty and reserve/guard military members should advise their instructor of all regularly scheduled military appointments and duties that conflict with scheduled course requirements. Instructors will make every effort to work with the student to identify adjusted timelines. If you are a veteran, please contact the Minnesota West Veterans Service Office.

To receive reasonable accommodations for a documented disability, please contact the campus Student Services Advisor or campus Disability Coordinator as arrangements must be made in advance. In addition, students are encouraged to notify their instructor.

This document is available in alternative formats to individuals with disabilities by contacting the Student Services Advisor or by calling 800-658-2330 or Minnesota Relay Service at 800-627-3529 or by using your preferred relay service.

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