

Fond du Lac Tribal and Community College
COURSE OUTLINE FORM

03/19/19

Please return this form to the college vice president of academic affairs and the chairperson of the Academic Affairs and Standards Council (AASC)

1. Prepared by: _____

2. Date submitted: _____

3. Date approved: 3/4/24 Date revised _____

4. Department/discipline: Chemistry

5. Department(s) endorsement(s): _____
(Signatures of the person(s) providing the endorsement are required.)

6. Course Title: Environmental Chemistry
Abbreviated course title for Transcripts (25 characters or less): _____

7. Course Designator: CHEM 8. Course Level: 1020

9. Number of Credits: Lecture 3 Lab 1

10. Control Number (on site) 48 Control Number (online) 24

11. Catalog/Course description:

Students will learn basic concepts of chemistry in the context of environmental science topics. How is the chemical composition of water, earth, and air affected by pollution and climate change? How can chemistry be used to improve industrial processes such as energy production and storage? Scientific ideas and skills will be introduced and practiced during the course to make the chemistry of the environmental topics understandable. Designed for environmental science students and those planning to transfer the course as a general education science course with lab.

12. Course prerequisite(s) or co-requisite(s): Accuplacer scores/ Other courses

Prerequisite(s): None

Co-requisite:

13. **Course Materials** (Recommended course materials and resources. List all that apply, e.g. textbooks, workbooks, study guides, lab manuals, videos, guest lecturers).

Instructor's choice.

Recommended:

- Chemistry in Context, 10th Edition, American Chemical Society, McGraw Hill, and associated lab manual. Students will need to purchase a scientific calculator, for about \$15. **OR**
- A compilation of open resource materials from chem.libretexts.org and a lab manual will be provided for student use. Students will need to purchase a scientific calculator, for about \$15.

14. **Course Content** (Provide an outline of major topics covered in course)

1. Elements and compounds

2. Minerals and Mining
3. Air composition and pollution
4. Ultraviolet radiation and the ozone layer
5. Climate change and carbon
6. Water and water pollution
7. Combustion and greenhouse gases
8. Alternative energy & energy storage
9. Polymers and plastics

15. Learning Goals, Outcomes, and Assessment

At FDLTCC we have 4 Competencies Across the Curriculum (CAC) areas. They are as follows:

- A. Information Literacy (the ability to use print and/or non-print tools effectively for the discovery, acquisition, and evaluation of information.)
- B. Ability to Communicate (the ability to listen, read, comprehend, and/or deliver information in a variety of formats.)
- C. Problem Solving (the ability to conceptualize, apply, analyze, synthesize, and/or evaluate information to formulate and solve problems.)
- D. Culture (knowledge of Anishinaabe traditions and culture, knowledge of one's own traditions and culture, knowledge of others' traditions and cultures, culture of work, culture of academic disciplines and/or respect for global diversity.)

Upon completion of this course, the student will be able to:

Learning Outcomes	Competencies (CAC)	Cultural Standards
Describe the chemical impacts of the combustion of fossil fuels on air, water, and ground pollution.	B, C	2
Interpret chemical and environmental data presented in graphical form.	A	
Apply the principles of chemistry to a specific environmental topic or issue.	B	
Demonstrate effective environmental chemistry laboratory techniques.	C	

WINHEC Cultural Standards:

1. **GIKENDAASOWIN – *Knowing knowledge*:** To develop human beings who value knowledge, learning, and critical thinking and are able to effectively use the language, knowledge, and skills central to an Ojibwe-Anishinaabe way of knowing.
2. **GWAYAKWAADIZIWIN – *Living a balanced way*:** To develop balanced human beings who are reflective, informed learners who understand the interrelatedness of human society and the natural environment, recognize the importance of living in harmony with creation, and are able to apply a systems approach to understanding and deciding on a course of action.

3. **ZOONGIDE'EWIN – *Strong hearted***: To increase the students' capacity to live and walk with a strong heart, humble and open to new ideas and courageous enough to confront the accepted truths of history and society.
4. **AANGWAAMIZIWIN – *Diligence and caution***: To develop students' capacity to proceed carefully, after identifying, discussing, and reflecting on the logical and ethical dimensions of political, social, and personal life.
5. **DEBWEWIN – *Honesty and integrity***: To increase students' capacity to think and act with honesty and integrity as they understand and face the realities of increasingly interdependent nations and people.
6. **ZAAGI' IDIWIN – *Loving and Caring***: To encourage students' acceptance of the diversity within their school, community, and environment by developing healthy, caring relationships built on respect for all.
7. **ZHAWENINDIWIN – *Compassion***: To expand students' knowledge of the human condition and human cultures and the importance of compassion especially in relation to behavior, ideas, and values expressed in the works of human imagination and thought.

16. **Minnesota Transfer Curriculum (MnTC)**: List which goal area(s) – up to two – this course fulfills.

See www.mntransfer.org

Goal Area(s): 3 & 10

Goal Area 3: Natural Sciences

To improve students' understanding of natural science principles and of the methods of scientific inquiry, i.e., the ways in which scientists investigate natural science phenomena. As a basis for lifelong learning, students need to know the vocabulary of science and to realize that while a set of principles has been developed through the work of previous scientists, ongoing scientific inquiry and new knowledge will bring changes in some of the ways scientists view the world. By studying the problems that engage today's scientists, students learn to appreciate the importance of science in their lives and to understand the value of a scientific perspective. Students should be encouraged to study both the biological and physical sciences

Students will be able to:

- Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
- Communicate their experimental findings, analyses, and interpretations both orally and in writing.
- Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

Goal Area 10: People and the Environment

To improve students' understanding of today's complex environmental challenges. Students will examine the inter-relatedness of human society and the natural environment. Knowledge of both bio-physical principles and socio-cultural systems is the foundation for integrative and critical thinking about environmental issues.

Students will be able to:

- Explain the basic structure and function of various natural ecosystems and of human adaptive strategies within those systems.
- Evaluate critically environmental and natural resource issues in light of understandings about interrelationships, ecosystems, and institutions.
- Propose and assess alternative solutions to environmental problems.
- Articulate and defend the actions they would take on various environmental issues.

17. Are there any additional licensing/certification requirements involved?

_____ Yes X No

Provide the required documentation to show course meets required licensing/certification standards.

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