



**KASKASKIA COLLEGE**

**CHEM 106 COURSE SYLLABUS**

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TEXT: Environmental Chemistry

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Grading policy:

Quizes 150

Discussions 100

Exams 750

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TOTAL 1000

Scores Letter grade

900-1000 A

800-899 B

700-799 C

600-699 D

<600 F

**. OBJECTIVES OF THE COURSE**

A. To Introduce the basic structure and bonding in molecules which include the periodic table

and its elements

B. To introduce how the human society is affected by the environmental chemistry

C. To introduce the structure and the composition of earth

D. To learn how water or air is polluted and how those can be prevented or how are those purified

E. To introduce how the metals can be identified, extracted and purified

F. To introduce the chemical structure and composition of soil. How soil can be contaminated and how to avoid contamination

G. To introduce and the formation and accumulation of oil as fossil fuels

H. To introduce the ideas how environment is affected by using wastes for the formation of oils

**Exams:** There will be total **4** exams. The Final Exam is Comprehensive

Discussion will be held every week . Each of the students need to participate in discussion to earn discussion credits

**Quizzes:** Please find the quizzes in the Assessment section.

### **Chapter 1: Concepts and Skills in Environmental Chemistry**

A. **Units of Measurements:** and their Importance, Errors, Precisions and Accuracy. Detection Limits and Significant Figures.

B. **Elements:** Periodic Table, Atomic Structures, Chemical bonding(p-91,ref-Chapter 4) and Crystals, structures, shapes and Classification of molecules with their Nomenclatures

C. **Moles and Molarity and Stoichiometric Calculations**

D. **Types of Chemical Reactions:**Acid-Base, Oxidation-Reduction, Precipitation and Complex Formation

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**EXAM I** \_\_\_\_\_

**Chapter 4: The Structure and Composition of the Earth**

E. The Structure and Compositions of Earth

F. **Weathering Processes:** Physical and Chemical Weathering with Mechanisms

G. **The Composition and Properties of Soil:** Soil Solutions, Soil Erosion, Soil Fertility and Soil **Contamination.**  
Determination of Soil pH. Determination of Organic Matter Content in Soil

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## EXAM II

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### Chapter 5: Earth's Vital Resources

H. **Mineral, Metal and Fuel Resources**

I. **Environmental Warfare:** The Corrosion Chemistry of Metals and Corrosion Protection

J. **Fossil fuels:** The Formation and Accumulation of Oil and Natural Gas, The Crude Oil and the Environment

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## EXAM III

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### Chapter 6: Natural Cycles

K. **Natural Cycles:** Cycling of Iron, Iron in Biological and Environmental Systems. Cycling of Carbon, Nitrogen, Oxygen, Sulfur, and Phosphorus

L. **Water:** The Lifeblood of the Earth: The types of water. The Properties, Importance and Cycle of Water with purification. Water Pollution and Quality of Water(Inland and Coastal)

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**FINAL EXAM: Comprehensive:**

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## Learning Outcomes

The Students will be able to understand and learn

1. The basic chemistry including the elements, atomic structures, chemical bonding, shapes and properties of molecules including their classification and distributions in the environment. The basic calculations using various units.
2. How the environment is rich in chemistry and our lives are affected and dependent environment
3. The composition and formation of earth
4. The composition and properties of soil, water and air. Soil solutions and their erosions
5. About the resources of minerals, metals and fuels
6. The formation and accumulation of oil and natural gas.
7. How the environment is affected by Crude oil
8. The Cycles and Purification of Minerals and important molecules like oxygen, sulfur, nitrogen and phosphorus
9. How water are classified. How water can be purified. Lead and Mercury Poisoning of water and how they affect our health
10. How environmental chemistry can change our health and economy