

DEPARTMENT OF CHEMISTRY

Common Course Outline

CHEM 105 – Chemistry and Society

Course Description

Designed for non-science majors and emphasizing the significance of chemistry in everyday lives and society. Topics may include the connection of chemistry to environmental resources, global climate change, consumer products or industrial applications. *Credits* – 3 semester hours.

Assessment Level(s): ELAI 990/ENGL 101/ENGL 011, MATH 050, READ 120.

General Education – Natural Science Distribution (NSND)

CHEM105 will satisfy the NSND General Education requirement. When CHEM106 is taken concurrently or in any later term, the combination of CHEM105 and CHEM106 will satisfy the NSLD General Education requirement. The General Education Program is designed to build the skills, knowledge, and attitude necessary for success in work and personal life. This course provides multiple opportunities to develop two or more of the following competencies: written and oral communication, scientific and quantitative reasoning, critical analysis and reasoning, technological competency, and information literacy.

Course scheduling

CHEM105 is scheduled at the Rockville campus every Fall and Spring semesters. CHEM105 DL (Distance Learning) option offered Fall, Spring, Extended Winter and Summer I sessions.

Broad Course Outcomes

Upon successful course completion, a student will be able to:

- Describe chemical and physical properties of atoms, ions, and molecules.
- Discuss topics of current social, economic, environmental and scientific interest.
- Evaluate risk-benefit decisions based on scientific information.

Specific Course Objectives

Upon successful course completion, a student will be able to:

- Identify matter as elements, compounds, or mixtures
- Use scientific measurements in chemistry calculations
- Distinguish between physical and chemical changes and properties
- Identify the basic components of the atom and distinguish between atoms, ions, and molecules
- Use the periodic table to determine the elemental information and periodic trends
- Write formulas of and names of chemical compounds and balance chemical equations
- Define acids and bases; recognize common acids and bases and describe their uses
- Discuss major air pollutants

- Describe properties of water and understand wastewater treatment methods.
- Balance nuclear equations and solve simple half-life problems.
- Describe additional topics of current social and economic interest, such as medicines, chemical risks and benefits, pollutants, polymers, synthetic materials, energy production and consumption.
- Make risk-benefit decisions based on scientific information.

Major Lecture Topics

Introduction to General Chemistry, Sustainability, Ecological Footprint, General Principles in Chemistry – Inorganic nomenclature, molecular formulas, balancing chemical equations. Composition of air, air quality, oxygen and ozone, electromagnetic spectrum, greenhouse gases, global climate change, unusual properties of water, water pollution and treatment techniques, acids and bases, pH scale, ocean acidification, acid rain, nuclear chemistry, radio-dating techniques, nuclear energy, combustion reactions and different forms of energy, plastics.

Course Requirements

Grading procedures will be determined by the individual faculty instructor, but will include the following *minimum* criteria:

- Minimum of three examinations
- Homework, quizzes, other assignments or projects as assigned by the instructor
- Signature General Education Assignment: Research paper and/or presentation

Grading Policy

The following letter grade policy will be used to determine the final course grade:

A 100 - 90% **B** 89 - 80% **C** 79 - 70% **D** 69 - 60% **F** <60%

Textbook Information

Chemistry in Context; Applying Chemistry to Society, 9th ed. American Chemical Society, McGraw Hill.

Textbook Chapter Coverage

- Chapter 1 – Portable Electronics: The Periodic Table in the Palm of Your Hand
- Chapter 2 – The Air We Breathe
- Chapter 3 – Radiation from the Sun
- Chapter 4 – Climate Change
- Chapter 5 – Energy from Combustion
- Chapter 6 – Energy from Alternative Sources
- Chapter 7 – Energy Storage
- Chapter 8 – Water Everywhere: A Most Precious Resource
- Chapter 9 – The World of Polymers and Plastics

Student Code of Conduct and Academic Honesty

Montgomery College Syllabus Information