

## General Chemistry I

### CHM 1045

#### Course Description:

This course is designed for students pursuing careers in the sciences or who need a more rigorous presentation of chemical concepts than is offered in an introductory course. Students will engage in problem solving and critical thinking while applying chemical concepts. Topics will include the principles of chemistry including atomic theory, electronic and molecular structure, measurement, stoichiometry, bonding, periodicity, thermochemistry, nomenclature, solutions, and the properties of gases.

#### Prerequisite:

MAC 1105 with a grade of "C-" or better or placement beyond MAC 1105. Students taking CHM 1045 after taking CHM 1020 and/or CHM 1032 may register for reduced credit, as indicated in the department's policy on reduced credit.

**Course Learning Objectives** (including liberal studies learning objectives assigned to the course):

Upon completion of this course, generally students will be able to

- use chemistry concepts and terms to describe everyday phenomena.
- use scientific thinking to solve real-world problems.
- appreciate the types of problems chemistry can be used to solve.
- engage in inquiry (especially by asking why and how questions).
- evaluate the reasonableness of your own and other people's answers to questions.
- make reasonable estimates and recognize trends.
- use images, diagrams, and structural models to represent chemical phenomena.
- think critically and cogently about causal relationships with scientific reasoning.
- assess previous experimentation and published scientific results.
- critically examine and evaluate scientific observation, hypothesis or model construction.
- articulate a variety of issues created by the complex interactions among science, technology, and society.
- use scientific perspectives to evaluate contemporary problems facing society.
- translate real-world observations into chemical terms, including by translating an observation to symbolic representation (e.g., heat to temperature) and describing chemical relationships using symbolic representations, and making decisions (i.e., conclusions) based on those relationships.

and more specifically students will

- differentiate between accuracy and precision in measurements.
- implement rules of significant numbers to all measurements.
- solve problems using the Unit-Label/Dimensional Analysis method.
- apply IUPAC rules of nomenclature.

- write formulas for ionic and molecular compounds.
- solve problems using mole relationships.
- balance chemical equations and predict products of chemical reactions.
- use balanced chemical equations to solve stoichiometry problems.
- predict and explain the products of chemical reactions (e.g., acid-base, oxidation-reduction, precipitation, dissociation).
- write net ionic equations for double replacement reactions.
- solve problems using solution concentration (molarity).
- solve problems using the gas laws.
- apply the law of conservation of matter and energy.
- relate the spectrum of an element to the structure of the atom.
- write the electron configuration for an element and relate to the structure of the atom.
- name and identify the four quantum numbers for an element.
- explain the fundamental properties of matter including but not limited to atomic and electronic structure, and periodicity.
- differentiate between ionic and covalent bonding.
- draw Lewis structures.
- predict molecular geometry and properties from bonding theories.

### **Grading Assignments:**

Homework; quizzes; worksheets; participation assignments; chemistry concept surveys; examinations; final examination; liberal studies assignment

### **LIBERAL STUDIES STATEMENTS**

This course has been approved to meet FSU's Liberal Studies Natural Sciences requirement and helps you become an effective interpreter of scientific results and a critical analyst of claims about the natural world.

By the end of this course, students will:

1. Pose questions or hypotheses based on scientific principles.
2. Use appropriate scientific methods and evidence to evaluate claims or theoretical arguments about the natural world.
3. Analyze and interpret research results using appropriate methods.

### **UNIVERSITY ATTENDANCE POLICY**

Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

## **ACADEMIC HONOR POLICY**

The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to "...be honest and truthful and... [to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy, found at <http://fda.fsu.edu/Academics/Academic-Honor-Policy>)

## **AMERICANS WITH DISABILITIES ACT**

Florida State University (FSU) values diversity and inclusion; we are committed to a climate of mutual respect and full participation. Our goal is to create learning environments that are usable, equitable, inclusive, and welcoming. FSU is committed to providing reasonable accommodations for all persons with disabilities in a manner that is consistent with academic standards of the course while empowering the student to meet integral requirements of the course.

To receive academic accommodations, a student:

(1) must register with and provide documentation to the Office of Accessibility Services (OAS); (2) must provide a letter from OAS to the instructor indicating the need for accommodation and what type; and, (3) should communicate with the instructor, as needed, to discuss recommended accommodations. A request for a meeting may be initiated by the student or the instructor.

Please note that instructors are not allowed to provide classroom accommodations to a student until appropriate verification from the Office of Accessibility Services has been provided. This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact the

Office of Accessibility Services  
874 Traditions Way  
108 Student Services Building  
Florida State University, Tallahassee, FL 32306-4167  
(850) 644-9566 (voice) (850) 644-8504 (TDD)  
[oas@fsu.edu](mailto:oas@fsu.edu)  
<https://dsst.fsu.edu/oas>

## **ACADEMIC SUCCESS**

Your academic success is a top priority for Florida State University. University resources to help you succeed include tutoring centers, computer labs, counseling and health services, and services for designated groups, such as veterans and students with disabilities. The following information is not exhaustive, so please check with your advisor or the Dean of Students office to learn more.

## CONFIDENTIAL CAMPUS RESOURCES

Various centers and programs are available to assist students with navigating stressors that might impact academic success. These include the following:

### **Victim Advocate Program**

University Center A, Rm. 4100

(850) 644-7161

Available 24/7/365

Office Hours: M-F 8-5

<https://dsst.fsu.edu/vap>

### **Counseling and Psychological Services (CAPS)**

Florida State University's Counseling and Psychological Services (CAPS) primary mission is to address psychological needs and personal concerns, which may interfere with students' academic progress, social development, and emotional well-being. The following in-person and virtual (tele-mental health) services are available to all enrolled students residing in the state of Florida:

1. Individual therapy
  2. Group therapy
  3. Crisis Intervention
  4. Psychoeducational and outreach programming
  5. After hours crisis-hotline
  6. Access to community providers for specialized treatment
- Call 850-644-TALK (8255) for more information on how to initiate services.

Counseling and Psychological Services

250 Askew Student Life Center

942 Learning Way

(850) 644-TALK (8255)

Walk-in and Appointment Hours:

M-F 8 am – 4 pm

<https://counseling.fsu.edu/>

### **Services at UHS are available to all enrolled students residing in Florida:**

The mission of University Health Services (UHS) is to promote and improve the overall health and well-being of FSU students. UHS provides a coordinated continuum of care through prevention, intervention, and treatment. Services include general medical care, priority care, gynecological services, physicals, allergy injection clinic, immunizations, diagnostic imaging, physical therapy, and a medical response unit. The Center for Health Advocacy and Wellness (CHAW) assists students in their academic success through individual, group, and population-based health and wellness initiatives. Topics include wellness, alcohol and other drugs, hazing prevention, nutrition and body image, sexual health, and power based personal violence prevention. For more information, go to [uhs.fsu.edu](https://uhs.fsu.edu).

University Health Services

Health and Wellness Center

960 Learning Way

Tallahassee, FL 32306

Hours: M-F, 8 am – 4 pm

(850) 644-6230

<https://uhs.fsu.edu/>