

Florida Agricultural and Mechanical University
College of Science and Technology
Tallahassee, Florida 32307

Syllabus for
CHM1045-02 General Chemistry I
Term: [Fall 2022] Credit Hours: [3],

Instructor Information

Instructor: Dr. Keerthi Senevirathne

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Phone: 850-599-3638

Office Location: 4045 Journalism **Place and Time:** MWF 8:00-8:50 am, TBA

Office Hours: MWF 3:30-4:30 pm

Delivery Mode

Face to Face

E-mail Communications: Instructor will communicate with students only by FAMU e-mail. No replies will be made for messages sent from e-mail addresses other than FAMU e-mail. No exception!

Academic Calendar: Fall 2022

Aug. 22 nd , 2022	Classes begin (Full-Time Studies)
Aug. 26 th , 2022	Last day to drop and add
Sept. 5 th , 2022	Labor day
Nov. 4 th , 2022	Last day to withdraw
Nov. 11 th , 2022	Veteran's day
Nov. 23 th – 25 th , 2022	Thanksgiving holiday
Dec. 2 nd , 2022	Last day of classes
Dec. 5 th -9 th , 2022	Final exam week

Philosophical Statement for Student Success

Your Work Ethic Determines What You Learn, What You Learn Determines Your Grade

Course Description

Fundamental principles and concepts of chemistry will be introduced. Topics include properties of matter, nomenclature, reactions, including redox reactions, concepts chemical stoichiometry, concepts of aqueous reactions and solution stoichiometry, concepts of thermochemistry, concepts of electronic structure of atoms, concepts of periodicity of elements, concepts of chemical bonding, concepts of molecular geometry and bonding theories, concepts of gases and gas laws.

This course should instill in you a strong appreciation of the importance of chemistry to other disciplines, such as biology, pharmacy, medicine and engineering. This course will also teach you to solve problems using analytical thinking skills as opposed to memorization techniques.

Course Purpose

Required course for science, engineering, pharmacy and pre-health professions majors.

Course Objectives

In accordance with the Academic Learning Compact specific outcomes of the Department of Chemistry for CHM1045 students can be summarized under the following rubrics:

- Demonstrate critical thinking skills as measured by the ability to solve chemical problems, and read, evaluate, and interpret numerical, chemical and general scientific information.
- Demonstrate proficiency in written and oral communications.
- Possess a thorough knowledge of basic chemistry
- Possess the ability to make effective use of information resources in chemistry applications.

Academic Learning Compact (ALC) / Expected Outcome

The ALC is located at the home page of the University (<http://www.famu.edu>) under 'Academics'

https://www.famu.edu/administration/strategic-planning-analysis-and-institutional-effectiveness/university-assessment/pdf/2019_2020current-alcs/ChemistryALCs.pdf

Graduates will demonstrate the following:

- 1. Communication:**
Effectively communicate concepts and principles of organic chemistry both orally and in writing.
- 2. Content:**
Knowledge of chemical principles and other chemical information gained through the aforementioned 'Learning objectives'.
- 3. Critical Thinking:**
Ability to analyze and solve chemical problems, read, evaluate and interpret numerical and general chemical information.
- 4. Information Resources:**
Ability to make effective use of information, resources and technology in chemical applications.

Course Requirements

Pre-requisites/Competencies:

Prerequisite(s): CHM 1025 or equivalents with passing grade.

Required Textbook:

Chemistry: A Molecular Approach, 4th Ed., Pearson, Tro, Nivaldo J.

Web Materials: Pearson Mylab and Mastering Chemistry Account, Famu Canvas

Supplies: **Non-programmable scientific calculator**

Required Technology:

- Internet connection
- Access to Canvas
- Web camera
- Headset with microphone

Online Materials

Constant use of the course website will have a major impact on your success in this course. Most of the relevant course material (i.e., syllabus, problem sets, test/quiz grades, homework, etc.) will be presented to you online via Pearson Mylab and mastering chemistry and blackboard, and not in class.

If you do not have access to a computer in your dormitory room, you may use the computers located in the various facilities on campus such as Coleman Library.

Pearson's MyLab Mastering Chemistry

Students must enroll in Pearson Mylab and Mastering Chemistry. All course material will be posted on **famu.canvas.com** or **Mylab and Mastering Chemistry (Quizzes and homework)**.

Instructional Strategies

Combined (Hybrid) pedagogic approaches will be practiced.

- a. Traditional Lecturing.
- b. Active Learning
- c. Supplemental Instruction

FAMU LMS Access

To access this course you will need access to the Internet and a supported Web browser (Internet Explorer, Firefox, Safari and/or Google Chrome). To ensure that you are using a supported browser and have required plug-ins, please run the Check Browser found in the course under **“How to Get Started”**.

Technical Assistance

If you need technical assistance at any time during the course or to report a problem with Canvas you can:

- Visit the [Office of Instructional Technology](#) page
- Contact the Office of Instructional Technology at 850-599-3460 or oit@famu.edu
- View tutorials to learn more about using Canvas

Course Outline/Schedule

Chapter/Sections	Topic	Assignments
Chapter 1 Sections: 1.6–1.8	<u>Matter, Measurement, and Problem Solving:</u> Measurements and units; SI base units; Temperature scales; Prefix multipliers; Volume and density; Intensive and extensive properties; Exact and inexact numbers, rounding, significant digits in calculations; Accuracy and precision; Conversion of units (dimensional analysis); Solving chemical problems;	Pearson Mylab & Mastering Chemistry Homework Chapter 1
Chapter 2 Sections: 2.3–2.9	<u>Atoms and Elements:</u> Atomic theories and laws that lead to them; The discovery of the electron; The structure of an atom; Subatomic particles, Introduction to the periodic table; Elements, isotopes, ions; Periodic law and the periodic table; Atomic mass, calculation of atomic mass by isotopic composition; Molar mass, the mole, Avogadro's number; Converting between mass, number of moles, number of particles.	Pearson Mylab & Mastering Chemistry Homework Chapter 2
Chapter 3 Sections: 3.2–3.12	<u>Molecules, Compounds, and Chemical Equations:</u> Chemical bonds; Representing chemical compounds; Writing chemical formulas and equations; Composition of and bonding in molecular and ionic compounds; Predicting formulas of ionic compounds, nomenclature (naming) of molecular and ionic compounds; Molar mass of a compound; Using molar mass to count molecules by weighing. Percent composition of compounds. Determination of chemical formulas (empirical and molecular) from experimental mass measurements – data given as masses, percent composition, or combustion analysis; Balancing chemical equations. Organic compounds.	Pearson Mylab & Mastering Chemistry Homework Chapter 3
Chapter 4 Sections: 4.2-4.9	<u>Chemical Quantities and Aqueous Reactions:</u> Reaction stoichiometry, mole-to-mole and mass-to-mass conversions; Definitions and calculations of limiting reactant, theoretical yield, and percent yield; Definitions of concentration, molar concentration, dilution, utilization in calculations; solution stoichiometry. Solubility, electrolytes and non-electrolytes, weak and strong electrolytes, solubility rules; Precipitation reactions – writing molecular, complete ionic, and net ionic equations; Acid-base and gas evolution reactions, strong and weak acids and bases; acid-base titrations; Oxidation reactions, assigning oxidation numbers to atoms; identifying oxidizing and reducing agent.	Pearson Mylab & Mastering Chemistry Homework Chapter 4
Chapter 5 Sections: 5.2-5.10	<u>Gases:</u> Pressure, units of pressure, conversion between units of pressure, instruments to measure pressure; Simple gas laws, ideal gas laws. Applications of the gas laws: molar volume, density, molar mass of a gas, definitions of partial pressures and Daltons law, utilization in calculations; Stoichiometry involving gaseous reactants or products; Kinetic molecular	Pearson Mylab & Mastering Chemistry Homework Chapter 5

Chapter/Sections	Topic	Assignments
	theory, mean free path, diffusion, effusion, Graham's law of effusion; Effect of intermolecular forces, real gases, Van der Waals equation.	
Chapter 6 Sections: 6.2–6.9	<u>Thermochemistry:</u> Key definitions; The first law of thermodynamics, internal energy, state function, system, surroundings, energy flow; quantification of heat and work: heat capacity, specific heat capacity, molar heat capacity; pressure-volume work; utilization of a bomb calorimeter to calculate ΔE . Enthalpy, exo-and endothermic processes; Thermochemical equations, stoichiometry involving enthalpy; Coffee-cup calorimetry and measuring the enthalpy of a reaction; Hess' law, standard enthalpy of formation, calculation of reaction enthalpy using standard enthalpy of formation.	Pearson Mylab & Mastering Chemistry Homework Chapter 6
Chapter 7 Sections: 7.2–7.6	<u>The Quantum Mechanical Model of the Atom:</u> The nature of light, parameters describing the wave; calculations of frequency and wavelength; electromagnetic spectrum, trends in energy, wavelength, and frequency; interference and diffraction; The particle nature of light, calculation of the energy of a photon, Bohr's model, explanation of the atomic emission; Wave nature of matter and De Broglie's wavelength. Quantum-mechanical model of the atom, quantum numbers, Shapes of atomic orbitals.	Pearson Mylab & Mastering Chemistry Homework Chapter 7
Chapter 8 Sections: 8.2-8.8	<u>Periodic Properties of the Elements:</u> Development of the periodic table; Definition of spin, Pauli's principle and Hund's rule; Electron levels and sublevels; Shielding and effective nuclear charge; Distribution of electrons in multielectron atoms; Periodic table and electron structure; Periodic trends in the atomic sizes. Electron configuration of ions; Trends in ionic radii; Ionization energy and trends in the ionization energies; Electron affinity and trends in the electron affinity.	Pearson Mylab & Mastering Chemistry Homework Chapter 8
Chapter 9 Sections: 9.2-9.10	<u>Chemical Bonding I: Lewis Theory:</u> Types of chemical bonding; Valence electrons in single atoms; Lewis dot structures for ions and ionic compounds; covalent bonding ; Lewis structures for covalent compounds, Electronegativity, bond polarity based on electronegativity differences; Trends in electronegativity; Dipole moment and percent ionic character; Lewis structures of molecular compounds, resonance structures, multiple bonds, formal charge; Exceptions to octet rule; Bond enthalpy, bond strength and bond length;	Pearson Mylab & Mastering Chemistry Homework Chapter 9

Chapter/Sections	Topic	Assignments
Chapter 10 Sections: 10.2-10.8	<u>Chemical Bonding II: Molecular Shapes, Valence Bond Theory, and Molecular Orbital Theory:</u> Molecular geometry; Prediction molecular shapes using the VESPR model; Electron group geometry and molecular geometry; Molecular symmetry and the polarity of molecules. Valence bond theory and covalent bonding; Explaining molecular geometries using hybrid orbitals; Describing multiple bonds using hybrid orbitals; Molecular orbital theory and covalent bonding; Bonding and antibonding orbitals; Bond order	Pearson Mylab & Mastering Chemistry Homework Chapter 10

Obtain schedule from the PDF file in Blackboard Master Course Shell.

Course Evaluation

- 4 Quizzes
- 4 Tests, and
- 10 Homeworks

Examinations:

There will be 4 periodic examinations. Questions may involve multiple choice and true/false responses.

Quizzes:

All quizzes will be given online through Canvas. Questions are in multiple choice formats. The quiz schedule is given in the "Quiz and Test Schedule" table. **The quizzes are timed, therefore, students are not allowed to take the quiz after the designated time has passed. No exception.**

Homework:

There will be 10 homeworks which will be given on Pearson Mylab and Mastering Chemistry. It is students' responsibility to complete homework in a timely manner. Homework WILL NOT be reopened under any circumstances.

Quiz and Test Schedule:

Quiz #	Exam #	Date
Quiz-1 [chapters 1-3] 9/15	EXAM I: [chapters 1-3]	9/17
Quiz-2 [chapters 4-5] 10/13	EXAM II: [chapters 4-5]	10/15
Quiz-3 [chapters 6-7] 11/3	EXAM III: [chapters 6-7]	11/5

Quiz #	Exam #	Date
Quiz-4 [chapters 8-10] 12/1	EXAM IV: [chapters 8-10]	12/3

The homework, quiz, and test schedule is tentative and the instructor reserves every right to adjust the dates as appropriate. Students will be promptly notified when and if adjustments are made.

Make-up exams:

Make-up exams will only be given for special circumstances, outlined by the University and/or college of Science and Technology, with the permission from the dean within a week of the particular exam. A dean-signed excuse form must be presented prior to the makeup exam. You must be aware that no makeup exams for exam 4 will be provided under any circumstances.

Make-up quizzes:

No makeup quizzes or homework will be given in this course.

Grading Scale

The final grade for this class will be based on the following:

Event	% Contribution
Four (4) Tests	80
Ten (10) Homework	10
Four (4) Quizzes	10
Total Points:	100

Grading scale:

Final Grades	(%)
A	85-100
B	75-84
C	65-74
D	50-64
F	below 50

Examinations:**Grade Calculation:***Example:*

Test 1= 80, Test 2= 50, Test 3= 85, Final exam= 60

Test Average = $(90 + 50 + 85 + 60) / 4$

Test Avg. = 71.25

Point contribution from tests for the final grade = $(\text{Test avg} \times 80) / 100$
= $(71.25 \times 80) / 100$
= 57 line 1

Quiz 1= 60, Quiz 2= 75, Quiz 3= 55, Quiz 4= 65

Quiz Average = $(60 + 75 + 55 + 65) / 4$

Quiz Avg. = 63.75

Point contribution from Quizzes for the final grade = $(\text{Quiz Avg} \times 10) / 100$
= $(63.75 \times 10) / 100$
= 6.38 line 2

HW 1=90, HW 2= 90, HW 3=70, HW 4=90, HW 5= 85, HW 6=70, HW 7=90,

HW 8= 80, HW 9=70, HW10=100

HW Average = $(90 + 90 + 70 + 90 + 85 + 70 + 90 + 80 + 70 + 100) / 10$ (total number of HWs it may be more than 10)

HW Avg. = 83.5

Point contribution from Homework for the final grade = $(\text{HW Avg} \times 10) / 100$
= $(83.50 \times 10) / 100$
= 8.35 line 3

To calculate final grade point, add lines 1, 2, and 3

Your final grade point = $57 + 6.38 + 8.35$
= 71.73 points ~ 72 points, Letter grade C

Re-grading Policy

If you feel that your test has been graded improperly, you may request in writing that it be re-graded. After a test is returned, you have exactly one week to hand in your test paper and written request for re-grading. The written request must be a single paragraph stating that the test has been graded improperly and why you are turning it in for re-grading. Staple the request to a copy of the test. Under no circumstances a test is accepted for re-grading after one week or without the written request. Under no circumstances disputed test items will be discussed until this procedure is exactly followed. If a different score is resulted from the re-grading process, the latest score (higher or lower) shall replace the old exam score.

WF: Assigned to students who stop submitting assignments, home works, and exams etc. before the published last day to withdraw (**Date 11/04**), without officially withdrawing from the class. The above scale should serve as a guide to show how your grade will be calculated.

The instructor reserves the right to adjust the grading scale so as to conform to the performance of the class. Please note that this does not in any way imply "CURVING." Students will be informed when and if any adjustments are made to the grading scale. Note: Last day to withdraw from course is **Nov. 4th 2022**.

Late Work Policy

Be sure to pay close attention to deadlines—there will be no make-up assignments or exams, or late work accepted without a serious and compelling reason, and approval.

Procedure for Resolving Faculty-Student Conflicts:

- Student first attempts to resolve issue with instructor
- Student submits written statement of problem to Departmental chair
- Chair forwards student statement to instructor
- Instructor responds in writing to chair
- Chair meets with instructor and/or student if necessary
- Chair forwards response/recommendation to Dean's office

Makeup Policy

A conflict exam/quiz will be offered to those students with valid conflicts. It is your responsibility to identify yourself as requiring such accommodation at least one week prior to the exam/quiz. If you experience technical difficulties with Canvas, contact the Office of Instructional Technology (OIT) immediately at 850-599-3460 or oit@famuedu.edu. Also you must contact your instructor via e-mail within 24 hours of the technical difficulty to be considered for a make-up. The office of Instructional Technology (OIT) must recognize your reported difficulty as an actual technical error from Blackboard (they may provide written note about the error) in order to schedule a make-up exam. If you have any other legitimate reason for a make-up (illness, family emergency, etc.) you (if you are in a specific program at FAMU) must contact your Dean's Office to have the situation verified before a make-up will be considered. Students who have not enrolled in a specific program at FAMU must directly submit documents (doctors notes or other proof for emergency) to the instructor to be considered for a make-up. Students must take their make-ups (Exam or quiz) within two weeks of the original exam/quiz date with the Dean's excuse/official note from OIT which explains about technical difficulties. You must be aware that no makeup exams for exam 4 WILL be provided under any circumstances.

Note: It is your responsibility to renew your password to i-Rattler/Canvas every 90 days; failure to log-in to Canvas due to the expired password or delaying to setup your password is not a valid reason for a Make-up exam/quiz or to reopen home works or any other kind assignments.

Intent to Grieve Form. Students must submit Intent to Grieve Forms, online, within two weeks of grades being made available for students to view in accordance with the University Registrar's calendar. Students cannot submit an Academic Grade Grievance without submitting an Intent to Grieve Form unless they receive an exception from the Associate Dean.

WF Assigned to students, who stop attending class before published last day to withdraw (November 4th), without officially withdrawing from the class.

The instructor reserves the right to adjust the grading scale so as to conform to the performance of the class. Please note that this does not in any way imply "CURVING." Students will be informed when and if any adjustments are made to the grading scale.

NOTE: LAST DAY TO WITHDRAW FROM COURSE IS **Nov. 4th 2022**
The above scale should serve as a guide to how your grade will be arrived at.

Viewing Grades in Canvas

- Points you receive for graded activities will be posted to the FAMU Canvas Grade Book. Click on the My Grades link on the left navigation to view your points.
- Your instructor will update the online grades each time a grading session has been completed—typically 3 days following the completion of an activity.

Course Policies

Attendance Holds

A brief quiz over the syllabus content is available in canvas. Once you take the quiz and score 100 percent you will be marked as attending (attendance holds will be removed) within 24 hours. You may take the quiz as many times as you like until you make 100 percent. Please review the syllabus carefully and take the quiz during the first three days of the semester.

Assignments

The homework and the quizzes for this course will be submitted electronically through canvas, unless otherwise instructed. Assignments must be submitted by the given deadline or special permission must be requested from instructor *before the due date*. Be aware that all assignments/ assessment correspond with the eastern standard time zone. Extensions will not be given beyond the next assignment except under extreme circumstances.

All discussion assignments must be completed by the assignment due date and time. Late or missing discussion assignments will result with a zero.

If you find that you have any trouble keeping up with assignments or other aspects of the course, make sure you let your instructor know as early as possible. Make sure you are proactive in informing your instructor when difficulties arise during the semester so that we can help you find a solution.

Dropping the Course

It is the student's responsibility to understand when they need to consider dropping a course. Refer to the FAMU Course Schedule for dates and deadlines for registration. After this period, a serious and compelling reason is required to drop the course. Serious and compelling reasons include: (1) Documented and significant change in work hours, leaving student unable to attend class, or (2) Documented and severe physical/mental illness/injury to the student or student's family.

Incomplete Policy

Under emergency/special circumstances, students may petition for an incomplete grade. An incomplete will only be assigned if the student has a passing score in the course. All incomplete course assignments must be completed within two weeks.

Online Etiquette

1. **Respect others and their opinions.** In online learning, students from very different backgrounds come together to learn. It is important to respect their feelings and opinions, even when they are quite different from your own.
2. **Watch your language and tone.** When you are communicating online, you have to rely solely on words to get your point across. The other person cannot see your facial expression or hear your tone of voice, so things like sarcasm and humor often don't come across very well. That's why it's important to take your time, choose your words carefully, and be as straightforward as you can.
3. **Consider the privacy of others.** Always ask for permission before you forward someone's email messages to someone else, and if you do reuse someone else's words (with their permission), make sure to acknowledge them appropriately. Keep in mind that all private email mail is considered copyrighted by the original author.
4. **Avoid inappropriate material.** It's tempting to forward messages you find clever or links to websites you find entertaining. If they are not directly relevant to the course, please don't do this, especially if the material is sexually suggestive, politically sensitive, or otherwise "edgy." Same goes for frivolous "joke" emails and chain messages. This is not the place for it.

5. **Be forgiving.** If someone writes something that you find offensive, mention it directly to the instructor. He or she is best equipped to address the situation. Remember that the person contributing to the discussion might be new to this form of communication. What you find offensive may have been unintended.
6. **Be concise.** When you are contributing to a discussion, be as brief as you can to get your point across. Adding a lot of unnecessary words just makes your message less clear. Try to stick to the point and not go off on irrelevant tangents.
7. **Read first, write later.** Don't add your comments to a discussion before reading the comments that are already there. And if you are responding to a previous comment, always make clear which comment you are responding to.
8. **DON'T TYPE IN ALL CAPS OR USE EXCESSIVE PUNCTUATION!!!!!!** Most people find this annoying and you may not be communicating your thoughts effectively.
9. **Proofread before you hit the send button.** Learning to be your own editor is a difficult and important skill. Think carefully about the content of your message before you send or post it. Once you push the button, there is no taking it back. Also, grammar and spelling is very important!

Policy Statement on Non-Discrimination

It is the policy of Florida Agricultural and Mechanical University to assure that each member of the University community be permitted to work or attend classes in an environment free from any form of discrimination including race, religion, color, age, disability, sex, marital status, national origin, veteran status and sexual harassment as prohibited by state and federal statutes. This shall include applicants for admission to the University and employment.

Academic Honor Policy Statement

Florida A&M University is committed to academic honesty and its core values, which include scholarship, excellence, accountability, integrity, fairness, respect, and ethics. These core values are integrated into this academic honesty policy. Being unaware of the Academic Honesty Policy is not a defense for violations of academic honesty. Additional detail on FAMU Academic Honesty Violations are provided in University Policy 2.012 (10).(s). If you have any questions, please see your Academic Advisor.

“All members of, and participants in, the academic life of the University are to be governed by academic honesty in all of their endeavors. Students and faculty are expected to uphold academic integrity and combat academic dishonesty.”

University Americans with Disabilities Act (ADA) Statement

The Florida A&M University Americans with Disabilities Act (ADA) Policy Statement states that “Individuals who need a reasonable accommodation must notify the Office of Equal Opportunity Programs at 599-3076.” It is the responsibility of the FAMU Equal Opportunity Programs (EOP) Office, through the ADA Coordinator, to ensure the Florida A&M University is in compliance with the Americans with Disabilities Act. If you have any questions, please contact your Academic Advisor or the University EOP Officer, Equal Opportunity Programs, 674 Gamble Street, Tallahassee, FL 32307, (850) 599-3076.

If you have a documented disability and verification from the [Center for Disability Access and Resources](#) (CeDAR) and wish to discuss academic accommodations, please contact your instructor as soon as possible. It is the student's responsibility to provide documentation of disability to CeDAR and meet with a CeDAR counselor to request special accommodation *before* classes start. CeDAR is located at 667 Ardelia Court, Tallahassee, FL 32307 and can be contacted by phone at (850)599-3180.

