**SYLLABUS**

# CHEM 1405

# INTRODUCTORY CHEMISTRY-I

## (SECTION 221CL)

**Prepared by**
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**COLLEGE OF THE MAINLAND**
**TEXAS CITY, TEXAS-77591**

**FALL 2021**

College of the Mainland™
SCIENCE AND MATH DEPARTMENT

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***Course Title, Course number & Course Section***

CHEM 1405.221CL

**Name of Course**
Introductory Chemistry-1

**Course Semester**
Fall 2021

**Time and Days of the Course**
6:00 PM-8:50 PM Tuesdays and Thursdays Room:346 Steam Building

**Instructor Information:**
**Name**: John Valdes, M.S., Professor of Chemistry,
**Email:** jvaldes@com.edu;
**Phone:** 409-933-8244
***Office Hours:*** Tuesdays and Thursdays 8:50-9:20 PM
**Location:** Room 346 Steam Building
**Course Communication:** Preferably by e-mail. You will get a reply before the next class period.
**Required Textbook:** Ebook from Achieve

**Course Description**
This course is an introduction to the language, techniques, methods and principles of chemistry primarily for chemical and refinery plant operators and technicians. Topics include measurements and conversion, basic atomic structure and periodic trends, basic molecular structure, inorganic and organic nomenclature, and organic functional groups. The states of matter, behavior of solids, liquids and gases, and the properties of solutions and solubility are addressed, especially as they relate to organic functional groups and molecular structure. The chemical properties of selected functional groups are described in the context of elementary stoichiometry, kinetics, equilibrium, acidity and alkalinity, and oxidation/reduction.

***Course Requirements***
During the semester student performance will be evaluated based on the semester exams, the cumulative final exam, Sapling homework, Laboratory experiments, Lab Journal & Lab reports, class participation, etc. You are required to purchase the scantrons for answering multiple choice portions in the exams and quizzes.

Each major examination will be announced prior to its scheduled administration, especially if any change is anticipated from the published class schedule. It is the student's responsibility to be aware of the time examinations are given if they are absent from class when the announcements are made.

**NOTE:** No examination may be taken more than once. Retake examinations will not be administered. There will be three exams, a final exam, and a small Laboratory test administered during the semester. In addition, a Chemical Elements exam will be given at the beginning of the semester. This exam is worth 50 points.

Details given below:

***1. Chapter Exams***

Three exams, three chapters each. If a student, without a valid, verifiable reason does not take one of the Chapter exams, a grade of zero may be recorded. You are allowed to make-up one of the missed chapter exams during the next scheduled class day, therefore maybe missing the lab session with no points scored for that lab. **These exams are in addition to the Chemical Elements exam, which is given the second week from the beginning of the course. Each of these exams are worth 100 points.**

***2. Final Exam***

The final exam is worth 100 points. **It is a mandatory exam.** The final exam will be a cumulative exam encompassing the material for the entire semester. Failure to take the final exam represents unsatisfactory progress and failure to complete the course. This will result in a course grade of "F".

***3. Laboratory Grade***

Laboratory sessions are a required portion of this course and allow you to practice skills and make observations of the concepts studied during class sessions. Your lab performance will be a part of your final grade. In order to fulfill all requirements you must attend laboratory sessions and demonstrate your ability to physically manipulate equipment and make detailed observations. Also, you must ***safely*** perform all lab experiments and clean up your lab station. Certain rules of conduct must be followed to minimize the possibility of your harming yourself or your fellow students. (Carelessness, horseplay, or destructiveness will result in your instructor dropping you from this course immediately). A laboratory test will be given at the end of the semester that includes details of labs that have been performed during the semester**. Again, all students within a group must leave together when finished, so to not leave his/her other lab partners to clean up or pick up afterward by themselves. Attendance and evaluation of the student will be graded by the instructor during the lab(s) section .**

A Pre-Lab talk covering specific instructions, procedures and safety features for some laboratory session will be given to you before you enter the laboratory. It is **mandatory** to attend this session before you perform a Laboratory experiment. The data that you obtain during the course of each experiment must be recorded on a DATA SHEET and later transfer to the appropriate place in your laboratory All questions and problems following each experiment are to be completed, unless the instructor directs otherwise.

The recording of data and solutions/answers to problems/questions are to be neatly written and legible. Failure to record data in this manner will result in a grade penalty. A pre-laboratory quiz may be given to assess the student's familiarity with the experiment. It will be worth half the lab points (5 points, one point each question). If given, those points will be part of the 10 points for the lab on that day.

The cumulative laboratory grade is used toward the total grade points, not including 30 points for the laboratory test. Each laboratory will be worth 10 points.

**At his discretion, the instructor may give a short "pre-lab" quiz before any laboratory to see if the student has read the lab in advance to become familiarized with the work for that day. If the student cannot answer the simple questions about that day's lab, 5 points will be deducted from the lab score. Since the procedure for the day's lab will be explained by the instructor, redundant questions once in the lab by the student on how to calculate a question, or a "how do I do this" will result in points taken off from the instructor's evaluation.**

**Students must earn a 70% or better in the laboratory component to successfully pass the course. Earning less than 70% in the laboratory component will result in an F for the course regardless of the lecture grade. Passing the laboratory component and failing the lecture component will not guarantee a passing grade for the course.**

**Each student must successfully attend and complete 70% or more of all laboratory assignment to pass the laboratory portion. Failure to attend and complete u0% or more of the laboratory assignments may result in a failing laboratory grade and a failing grade for the course.**

**Deviations from this policy will be at the sole discretion of the instructor.**

***4. Online -Home Work : Achieve Learning***

Completing assigned homework problems for the maximum of six chapters is worth 80 points (10 points for each chapter). Online homework is part of the Sapling Learning system. The homework assignment for a chapter has to be completed online. **Home work for a chapter is due the Saturday after the test for chapters 7, 8 ,9 at 11:59 PM.**
The Achieve homework for **all** chapters will be open throughout the semester for student review and/or practice. However, the first six chapters are the only ones that will be graded. On Sapling, you will see the last day of class as the due date of all homework. This means that you can review the chapters on your own until the last day of class.
**Again, as it is detailed above, all the homework for the 8 chapters is due on the Saturday after the test on chapters 7, 8, 9 are taken.**

## Determination of Course Grade

## 14. Grading Scale

Your semester grade will be based on the semester exams, the final exam, Sapling, class participation/instructor evaluation, laboratory grade, and Chemical Elements test.

There are total of **740** points possible:

| | | |
|---|---|---|
| Chemical Elements | | = 50 |
| Semester Exams: | 3 @100 | = 300 |
| Final Exam | | = 100 |
| Achieve Home Work | | = 80 |
| Laboratory grade (total = 18) | | = 180 |
| Lab test | | = 30 |

You must have the following course averages to receive the grades:

| Points | Average | Grade |
|---|---|---|
| 666 – 740 | 90-100% | A |
| 592 – 665 | 80-89% | B |
| 518 – 591 | 70-79% | C |
| 444 – 517 | 60-69% | D |
| 0 – 443 | 0-59% | F |

## Course Outline

**TENTATIVE CLASS/LAB SCHEDULE FALL SEMESTER 2021**

**(The instructor reserves the right to modify/ change labs, dates, chapters, etc.)**

**Week 1**

**Tues 8/24** — **Chapter 1.**
**Safety Video. Orientation. Handouts, Common laboratory glassware in lab.**

**Thur 8/26** — **Exp. 1: Chemical Lab Safety.**
**Chapter 1.**

**Week 2**

**Tues 8/31** — **Chapter 1 & 2 Video: Measurements.**
**Exp. 2: Making Measurements in Chemical Lab**
**Assigned calculations to be turned in on Tuesday 2/5 if decided by instructor.**

**Thursday 9/2** ---------- **TEST ON CHEMICAL ELEMENTS.**
**and**
**Thur 9/2** — **Exp. 3: Relating Mass and Volume**
**Chapter 2 and 3. Review for Test.**

**Week 3**

**Tues 9/7** — **TEST UNIT 1 (CHAPTERS 1, 2, 3)**

**Thur 9/9** — **Exp. 4: Exothermic-Endothermic Reactions.**
**Chapter 4.**

**Week 4**

**Tues 9/14** — **Exp. 5: Separating a Ternary Mixture ($CaCO_3$)**

| | |
|---|---|
| | **Part I.** |
| | **Chapter 4.** |
| **Thur 9/16** | **Exp. 6: Separating a Ternary Mixture (CaCO3). Part II. Chapter 5.** |
| | **Video: Periodic Table.** |
| **Week 5** | |
| **Tues 9/21** | **Exp. 7: Dry lab: Periodic Table.** |
| | **This lab to be turned in on 2/26.** |
| | **Video: Periodic Table. Chapter 5.** |
| **Thur 9/23** | **Exp. 8: Boyle's Law. P-V (Gas law).** |
| | **Chapter 5 (continuation).** |
| **Week 6** | **Finish Chapter 5. Start chapter 6.** |
| **Tues 9/28** | **Exp. 9: P-T Law (Gas law)** |
| | **Video on Chemical Bonding** |
| **Thur 9/30** | **Finish Chapter 6.** |
| | **Review for test chapters 4, 5, 6.** |
| **Week 7** | |
| **Tues 10/5** | **TEST CHAPTERS 4, 5, 6.** |
| **Thur 10/7** | **Exp. 10: Evaporation and Intermolecular Attractions** |
| | **Chapter 7.** |
| **Week 8** | |
| **Tues 10/12** | **Exp. 11: Ions: The effect of Concentration.** |
| | **Chapter 7.** |
| **Thur 10/14** | **Exp. 12: Factors Affecting Reaction Rates** |
| | **Chapter 8.** |
| **Week 9** | |
| **Tues 10/19** | **Chapter 8. Start Chapter 9** |
| | **Exp. 13: pH of Household Products** |
| **Thurs 10/21** | **Exp. 14: Titrating Vinegar** |
| | **Chapter 9.** |
| **Week 10** | |
| **Tues 10/26** | **Chapter 9 (Cont.) Stoichiometry.** |
| | **Review for test chapters 7, 8 , 9.** |
| **Thurs 10/28** | **TEST CHAPTERS 7, 8, 9.** |
| **Week 11** | |
| **Tues 11/2** | **Exp. 15: Titrating an unknown acid (manual)** |
| | ***Chapter 10.*** |

| | |
|---|---|
| **Thurs 11/4** | **Exp. 16:Mono-ProticAcid-Base titration (comp.)**<br>**Chapter 10.** |
| **Week 12** | |
| **Tues 11/9** | **Chapter 14** |
| **Thurs 11/11** | **Exp. 17: Heat of Fusion for Ice**<br>**Chapter 14.** |
| **Week 13** | **Chapter 14 (Cont.)** |
| **Tues 11/16** | . |
| **Thur 11/18** | **Chapter 14 and 15 (Cont.)** |
| **Week 14** | |
| **Tues 11/23** | **Exp. 18: Dry Lab: Drawing Organic Molecules**<br>**Chapter 15.** |
| **Thur 11/25** | **THANKSGIVING HOLIDAY. NO CLASSES.** |
| **Week 15** | |
| **Tues 11/30** | **Finish Chapter 15 if needed. Quick review of Review of the Organic Chemistry chapters**<br>**LAB TEST** |
| **Thur 12/2** | **Review for final exam.** |
| **Week 16** | |
| **Tues 12/7** | **FINAL EXAM (comprehensive) all chapters.** |
| **Thur 12/9** | **Final grading.** |

## Course Policies and Guidelines

### *Attendance*

Students are expected to attend each lecture and laboratory session for which they are registered. **IF YOU MISS MORE THAN FIVE CLASSES, YOU MAY RECEIVE A FAILING GRADE FOR THE COURSE, UNLESS YOU HAVE A VERY VALID EXCUSE FOR MISSING CLASS. NOT GOING TO CLASS (LECTURE), BUT GOING ONLY TO THE LAB WILL STILL BE CONSIDERED TO BE ABSENT.**

## Tardiness Policy

Students who arrive late or leave early will be considered tardy i.e., not in full attendance. Keep in mind that students who are tardy create distractions or disruptions of the learning process and everything must be done to avoid being late or leaving early. Students who are tardy on exam days will be given the exam but must turn it in when the students who were on time have completed their exams.

Attendance sign out sheets will be available at the end of each lab period. Students who leave early will not be allowed to sign the attendance sheet. Some of the Laboratory experiments are shorter, and may not require all the scheduled time. During such days students are expected to work on interpreting the Lab results, or work on assignments or study materials related to the lecture class. Students are required to be in the Laboratory during the scheduled time**, and must not leave before his/her lab partners do. Doing so will result on student who left before time getting a 0 (zero) for that lab.**

## Late work

Laboratory reports submitted after the due time on the due date to the end of the last scheduled class day of the week will be deducted 5 points. Any part of the laboratory reports submitted later than the above mentioned period will not be accepted.

## Make-up work

If an exam is missed, it will be allowed to be taken as soon as possible, but not later than the next scheduled chemistry 1405 class. Such test may be taken during the regular hours of chemistry 1405 class period at a designated area in the building, or at the Testing Center location in the Administration Building. If the same student misses another scheduled test, **30 percent of the grade will be deducted from his/her actual grade.**

## Concerns/Questions Statement

If the student has any questions or concerns about any aspect of this course, please contact using the contact information previously given. If, after discussing the concern with me you continue to have questions, please contact Sheena Abernathy, Head of the Department of Science at (409) 933-8330.

## COM Policies

### *Withdrawal*

If a student fails to attend class and demonstrates poor progress toward the course objectives, the instructor may suggest that the student consider withdrawing from the course. It is the student's responsibility to withdraw from the course and file the appropriate "drop form" with the Registrar's Office. If you stop attending class and fail to withdraw from the course, you will receive a grade of "F" in the course.

### *Student Success Tips*

- *Attend Class:*
  - *Pay attention.*
  - *Be prepared.*
  - *Ask questions.*

- *Take good notes:*

- *Write down as much as possible.*
- *Listen for signals.*
- *Use abbreviations and symbols.*
- *Copy **whatever** is written on the board.*
- *Look over notes before the next class.*

- *Study Early and Often:*
  - *Stay Ahead or at least Current.*
  - *Study two to three hours for each hour of lecture.*
  - *Study one to two hours for every three hours of lab.*

- *Approaches to Studying:*
  - *Information presented sequentially and often in mathematical terms.*
  - *Learn early topics well.*
  - *Build on foundation.*

- *Actual Studying:*
  - *Study in an environment similar to the testing environment.*
  - *Begin with Course Objectives.*
    - *Read over class notes with text.*
    - *Work assigned exercises and problems.*
    - *Work more exercises and problems.*

- *Test Taking:*
  - *Stay relaxed.*
    - *Preparation reduces anxiety.*
  - *Solve problems systematically.*
  - *Perform a first pass answering all of the question you are certain of.*
  - *Work all problems.*
  - *On multiple choice questions eliminate the wrong answers.*

- *Laboratory Preparation:*
  - *Peruse the Introduction and Experimental Procedure **before** lab.*
  - *Don't miss-no make-up labs.*
  - *Stay focused.*

## ADA Statement:

Any student with a documented disability needing academic accommodations is requested to contact Holly Brankston, Office of Services for Students with Disabilities, at hbrankston@com.edu at 409-933-8520. The Office of Services for Students with Disabilities is located in the Student Success Center.
http://www.com.edu/student-services/counseling.php
http://www.com.edu/counseling/disability-services

## Early Alert Program

The Student Success Center at College of the Mainland has implemented an Early Alert Program. I have been asked to refer students to the program throughout the semester if they are having difficulty completing assignments or have poor attendance. If you are referred to the Early Alert Program you will be contacted by someone in the Counseling Department. As student success and retention is very important to us, someone from the Counseling Department will schedule a meeting with you to see what assistance they can offer in order for you to meet your academic goals.

## Classroom Conduct Policy

College of the Mainland requires that students enrolled at COM be familiar with the Standards of Student Conduct, which can be found in the on-line Student Handbook. http://www.com.edu/student-services/student-handbook.php . Students should act in a professional manner at all times. Disruptive students will be held accountable according to college policy. Any violations of the Code of Conduct will result in a referral to the Office for student Conduct and may result in dismissal from this class. If you are in any way disruptive in class, I will document it and let you know privately. At the third time I have to call you in, you will be dropped from the course. Cell phones are not allowed on the desk or at any physical part of the student body, except in his/her pocket or backpack. If a student needs to use the phone during class, he or she must step outside to use it. Note will be taken of the times the student does this. After the fourth time during the semester, the student will be considered absent from class for the day when the student commits the 4th. transgression of telephone usage.

The use of electronic smoking devices is prohibited in class, as well as on Campus proper.

## Academic Dishonesty

Any incident of academic policy will be dealt with in accordance with college policy and the Student Handbook. Academic dishonesty – such as cheating on exams is an extremely serious offense and will result in a **grade of zero** on that exam and the student will be referred to the Office of Student Conduct for the appropriate discipline action. For that purpose, cell phones **are not** allowed to be used as a calculator. In addition, cell phones are not allowed to be out during class. If you have a cell phone on and out, you will be subject to the same "three strikes" rules detailed in the previous paragraph.

## Plagiarism

Plagiarism is using someone else's words or ideas and claiming them as your own. Plagiarism is a very serious offense. Plagiarism includes paraphrasing someone else's words without giving proper citation, copying directly from a website and pasting it into your paper, using someone else's words without quotation marks. When in doubt – cite!! Any assignment containing any plagiarized material will receive a **grade of zero** and the

student will be referred to the Office of Student Conduct for the appropriate discipline action.

### *Link to resources about avoiding plagiarism:*

Please use the information provided in the following links to avoid plagiarism.
http://en.writecheck.com/ways-to-avoid-plagiarism/
http://www.plagiarism.org/plagiarism-101/prevention/
http://isites.harvard.edu/icb/icb.do?keyword=k70847&tabgroupid=icb.tabgroup106849
https://owl.english.purdue.edu/owl/resource/589/01/
https://writing.wisc.edu/Handbook/QPA_plagiarism.html

## Concerns/Questions Statement:

If you have any questions or concerns about any aspect of this course, please contact me using the contact information previously provided. If, after discussing your concern with me, you continue to have questions, please contact Leslie Richardson, Head of the Department of Math & Science at lrichardson@com.edu (409) 933-8329.

## Student Learner Outcomes

Upon the successful completion of the course, the students will be able to:

1. develop a sound foundation in the vocabulary of chemistry, the nomenclature of Inorganic and selected organic substances, and the physical and chemical properties of inorganic and selected organic substances.
2. understand the fundamental facts, principled, theories, laws, and concepts necessary for further studies in science and related subjects.
3. categorize the structure, states, and physical and chemical properties of matter.
4. identify and solve basic chemistry problems, conversions and calculations.
5. use proper safety techniques and locate needed safety information.
6. follow laboratory procedures, correctly manipulate laboratory equipment, properly handle chemicals, and prepare and submit properly recorded data and laboratory questions.
7. develop the ability to work cooperatively with classmates.

## General Core Objectives

Students successfully completing this course will demonstrate competency in the following Core Objectives:

1. **Critical Thinking Skills**: to include creative thinking, innovation, inquiry, analysis, evaluation and synthesis of information;
2. **Communication Skills**: to include effective development, interpretation and expression of ideas through written, oral and visual communication;
3. **Empirical and Quantitative Skills**: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.
4. **Teamwork:** to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal.

## Table Mapping SLOs' Core Objectives and Assignments

| Student Learner Outcomes | Maps to Core Objectives | Assesses via this assignment |
|---|---|---|
| 1. Develop a sound foundation in the vocabulary of chemistry, the nomenclature of inorganic and selected organic substances, and the physical and chemical properties and selected organic substances<br>2. Understand the fundamental facts, principles, theories, laws, and concepts necessary for further studies in science and related subjects<br>3. Categorize the structure, state, and physical and chemical properties of matter.<br>4. Follow laboratory procedures, correctly manipulate laboratory equipment, properly handle chemicals, use proper safety techniques, locate needed safety information<br>5. prepare and submit properly recorded data and laboratory questions | Critical Thinking (CT)<br>Empirical and Quantitative Skills (EQS) | 1. Final Exam –selected questions<br>2, 3.Final Exam – selected questions<br>4, 5. Laboratory Evaluation |
| 6. Identify and solve basic chemistry problems, conversions, and calculations. | Critical Thinking (CT)<br>Empirical and Quantitative Skills (EQS) | Final Exam –selected questions |
| 7. Develop the ability to work cooperatively with classmates. | Team Work (TW)<br>Communication Skills-written (CS) | Lab Procedure grade<br>Laboratory evaluation Grade (CS) |

## Description of Assignments Used to Assess the Core Objectives:

**Critical Thinking Skills** will be assessed using selected questions from the final examination.

These assessments require students to

- To demonstrate their knowledge in their understanding of energy and measurements, and the basic understanding of important chemical concepts (SLO #1) such as the atoms and chemical reactions, density and specific gravity, and chemical calculations (SLO #2) and implications of pressure, volume, temperature changes in organic and inorganic materials.
  *Example question*: Explain the reason why 1g of cotton is of low density compared to 1g of iron?

**Empirical and Quantitative Skills** will be assessed using selected questions from the final examination.

These assessments require students to

- Understand the basic calculations (SLO #1) leading to the interpretation of theoretical principles and chemical concepts (SLO #2)
  *Example question*: Calculate the pH of an alkaline solution of with a

$[OH^-]$ of $1.0 \times 10^{-1}$M?

**Communication skills** will be assessed using will be assessed using an assignment that requires students to:

- Record accurately the laboratory procedure on a laboratory note book (written skills) (SLO #3)

**Team Work Skills** will be assessed using grades on selected laboratory experiments. These assignments require students to:

- Work together in the laboratory as a team to apply the basic methodologies explained in the laboratory Manuel in handling the laboratory apparatus (SLO# 3), and to jointly conduct the experiments. The successful completion indicates full cooperation between team members.
  *Example question:* Experiments – Separating the components of a Ternary mixture, evaporation and intermolecular attraction, distillation.

These assignments require students to work together in the laboratory as a team to apply the basic methodologies explained in the laboratory Manual in handling the laboratory apparatus (SLO #7), and to jointly conduct the experiments.
The successful completion indicates full cooperation between team members.
Example question: Experiment- Separating the Components of a Ternary Mixture, Evaporation and intermolecular attractions, Distillation, etc.

The Speaking, Reading and Writing Center provides free tutoring services to students, staff, and faculty seeking assistance for writing, reading and oral presentations for academic and non-academic assignments/projects. Located in the Technical Vocational Building, Room 1306, the center provides fact-to-face and online tutoring sessions in a welcoming environment. Appointments can be made in person, or on the center scheduler at com.mywconline.com, or by clicking the SRWC icon on the COM website.

**PS: <u>Any portion</u> of the Syllabus may be modified or upgraded by the instructor. The students will be informed of any changes/updates to this syllabus. The most updated copy will be made available on Blackboard.**