



Division of Natural Sciences and Geology

Department of Chemistry

<http://learning.hccs.edu/programs/chemistry>

CHEM 1305: Introductory Chemistry | Lecture | #15256

Spring 2020 | 16 Weeks (1.21.2020-5.17.2020)

In-Person | Stafford | Friday 8 - 10:50 a.m.

3-hour lecture course | 48 hours per semester

Instructor Contact Information

Instructor: Gomathi Ramanoudjame, Ph.D.

HCC Email: gomathi.ramanoudjame@hccs.edu

Please feel free to contact me concerning any problems that you are experiencing in this course. Your performance in my class is very important to me. I am available to hear your concerns and just to discuss course topics. I will respond to emails within 24 hours Monday through Friday; I will reply to weekend messages on Monday mornings.

What's Exciting about This Course

Chemistry is everywhere in the world around you! It's in the food you eat, clothes you wear, water you drink, medicines, air, cleaners... you name it. Chemistry sometimes is called the "central science" because it connects other sciences to each other, such as biology, physics, geology, and environmental science. Here are some of the best reasons to study chemistry. Chemistry helps you to understand the world around you. Why do leaves change color in the fall? Why are plants green? How is cheese made? What is in soap and how does it clean? These are all questions that can be answered chemistry. Basic knowledge of chemistry helps you to read and understand product labels.

My Personal Welcome

Welcome to Introduction to Chemistry—I'm delighted that you have chosen this course. One of my passions is the elucidation of chemistry concepts. I can hardly wait to pass that on. I will present the information in the most exciting way I know, so that you can grasp the concepts and apply them now and hopefully throughout your life. As you read and wrestle with new ideas and facts that may challenge you, I am available to support you. The fastest way to reach me is by my HCC email. The best way to really discuss issues is in person and I'm available during posted office hours to tackle any questions you might have. My goal is for you to walk out of the course with a better understanding of yourself and of human behavior. So please visit me or contact me whenever you have a question.

Prerequisites and/or Co-Requisites

MATH 0312. Chemical concepts and exams are emphasized from a mathematical approach. A student taking this class without the proper prerequisite does so at his/her own risk and may be subject to class dismissal through the chemistry department. Please carefully read and consider the repeater policy in the [HCCS Student Handbook](#).

Eagle Online Canvas Learning Management System

This section of CHEM 1305 will use [Eagle Online Canvas](#) to supplement in-class assignments, and activities. HCCS Open Lab locations may be used to access the Internet and Eagle Online Canvas. It is recommended that you **USE [FIREFOX](#) OR [CHROME](#) AS YOUR BROWSER**.

Instructional Materials

Textbook Information

The materials listed below are **required** for this course.

1. **Introductory Chemistry: Concepts and Critical Thinking (8th Edition)**

Charles H. Corwin

ISBN-13: 9780134421377 (Textbook Only)

2. Scantrons

3. A Nonprogrammable scientific calculator

Other Instructional Resources

Tutoring

HCC provides free, confidential, and convenient academic support to HCC students in an online environment and on campus. Tutoring is provided by HCC personnel in order to ensure that it is contextual and appropriate. Visit the [HCC Tutoring Services](#) website for details.

Libraries

The HCC Library System consists of 9 libraries and 6 Electronic Resource Centers (ERCs) that are inviting places to study and collaborate on projects. Librarians are available both at the libraries and online to show you how to locate and use the resources you need. The libraries maintain a large selection of electronic resources as well as collections of books, magazines, newspapers, and audiovisual materials. The portal to all libraries' resources and services is the HCCS library web page at <http://library.hccs.edu>.

Supplementary Instruction

Supplemental Instruction is an academic enrichment and support program that uses peer-assisted study sessions to improve student retention and success in historically difficult courses. Peer Support is provided by students who have already succeeded in completion of the specified course, and who earned a grade of A or B. Find details at <http://www.hccs.edu/resources-for/current-students/supplemental-instruction/>.

Course Overview for CHEM 1305

A general introduction to the field of chemistry, with an emphasis on the impact of chemistry in our everyday lives and our environment. Core curriculum course.

Core Curriculum Objectives (CCOs) for all CHEM Core Courses

CHEM 1311 satisfies the chemistry requirement in the HCCS core curriculum. The HCCS Chemistry Discipline Committee has specified that the course address the following core objectives:

1. Demonstrate basic mastery of chemistry by writing formula and equations for chemical reactions, performing chemical calculations and recognizing the application of chemistry in our daily lives
2. Demonstrate a mastery of introductory and intermediate level chemistry to promote success in higher level chemistry and other science programs in four year universities
3. Demonstrate a mastery of General and Organic Chemistry in preparation for allied and professional health programs and engineering
4. Conduct laboratory experiments by making measurements, performing chemical reactions and analyzing the results in a group or individual setting.

Program Student Learning Outcomes (PSLOs) for all CHEM Courses

Can be found at <http://learning.hccs.edu/programs/chemistry>

Course Student Learning Outcomes (CSLOs) for CHEM 1305

Upon completion of CHEM 1305, the student will be able to:

1. To appreciate that chemistry is an interesting and relevant subject. Describe the modern practices of chemistry.
2. Understand the importance of instrumental measurements. Express measurements in metric and English units to gain a practical awareness of metric sizes.
3. Classification of matter, elements in the periodic table and properties of a substance as chemical or physical.

4. Describe models of atoms proposed by different scientists. Calculate atomic mass of an element. Explain the relationship between energy levels in an atom and lines in an emission spectrum.
5. State the original periodic law and the modern periodic law. Predict the physical properties of an element and chemical formula of a compound given the information in the periodic table.
6. Write balanced chemical equations and distinguish different types of chemical reactions.
7. To interpret the coefficients in a balanced equation as a mole ratio. Perform mass-mass, volume-volume and mass-volume stoichiometry calculations.
8. Learn properties of gases, variables affecting gas pressure and calculate pressure, volume or temperature of a gas after a change in conditions.
9. Explain how valence electrons create a chemical bond. Formation of different types of chemical bonds. Draw electron dot and structural formula of a molecule. Determine shape of a molecule considering the repulsive force of valence electrons

Learning Objectives for CHEM 1305

Learning Objectives for each CSLO can be found at Learning Objectives for CHEM 1305. Specifically, they are:

- 1.1 To describe the early practice of chemistry.
- 1.2 To describe the modern practice of chemistry
- 1.3 To appreciate that chemistry is an interesting and relevant subject. 2.1 To identify typical instruments in a chemistry laboratory and explain why an instrumental measurement is never exact.
- 2.2 To identify the number of significant digits in a given measurement. 2.3 To round off a given value to a stated number of significant digits. 2.4 To explain the concept of exponents and specifically powers of 10. 2.5 To describe the three steps in the unit analysis method and apply this method of problem solving.
- 2.6 To explain the concept of percent and apply percent as a unit factor. 3.1 To list the basic units and symbols of the metric system.
- 3.2 To express a given metric measurement with a different metric prefix
- 3.3 To describe the technique of determining the volume by displacement.
- 3.4 To explain the concept of density and perform calculations that relate density to mass and volume
- 3.5 To state the values for the freezing point and boiling point of water on the Fahrenheit, Celsius and Kelvin scales
- 4.1 To describe the motion of particles in the solid, liquid, and gaseous states of matter
- 4.2 To classify a sample of matter as an element, compound, or mixture. 4.3 To distinguish between the properties of metals and nonmetals
- 4.4 To explain the law of definite composition of a compound.
- 4.5 To classify a property of a substance as physical or chemical.
- 4.6 To apply the conservation of mass law to chemical changes.
- 4.7 To distinguish between potential and kinetic energy.
- 4.8 To apply the Conservation Of Energy Law to physical and chemical changes.
- 5.1 To describe the Dalton, Rutherford, and Thompson's models of the atom.
- 5.2 To explain the concept of relative atomic mass.

- 5.3 To explain the way nature of light and state the relationship of wavelength, frequency, and energy of light.
- 5.4 To explain the quantum concept applied to matter and energy.
- 5.5 To describe the Bohr model of the atom and explain the relationship between energy levels in an atom and lines in an emission spectrum.
- 5.6 To write the predicted electron configurations for selected elements.
- 5.7 To describe the quantum mechanical model of the atom and compare the relative sizes and shapes of "s" and "p" orbitals.
- 6.1 To state the original Periodic Law proposed by Mendeleev and modern Periodic Law proposed by Mosley.
- 6.2 To classify the elements according to their groups and periods in the periodic table.
- 6.3 To describe the trend in atomic size and metallic character within a group or period of elements.
- 6.4 To predict a physical property for an element given the value of other elements in the same group
- 6.5 To predict the number of valence electrons for any representative element
- 6.6 To draw the electron dot formula for any representative element. 7.1 To classify a compound as a binary ionic, ternary ionic, or a binary molecular compound.
- 7.2 Write chemical formulas for compounds composed of monoatomic ions and polyatomic ions
- 7.3 To write names and formulas in binary and ternary oxyacids.
- 8.1 To state observation that are evidence for a chemical reaction.
- 8.2 To write balanced chemical equations.
- 8.3 To distinguish five types of chemical reactions
- 8.4 To write a balanced chemical equation for the reaction of an acid and a base.
- 9.1 To state the value of Avogadro's number
- 9.2 To relate the moles of the substance to the number of particles
- 9.3 To relate the mass of the substance to the number of particles.
- 9.3 To state the value for the molar volume of any gas at STP.
- 9.4 To calculate the percent composition of a compound given its chemical formula
- 10.1 To relate the coefficients in a balanced chemical equation to: A) moles of reactants and products and B) liters of gaseous reactants and products
- 10.2 To relate the number of moles of two substances in a balanced chemical equation
- 11.1 To list properties of a gas
- 11.2 To state standard atmospheric pressure in different units
- 11.3 To identify variables that affect the pressure of a gas
- 11.4 To state whether gas pressure increases or decreases for a given change in volume, temperature, or the number of moles of gas
- 11.5 To explain the concept of vapor pressure
- 12.1 To explain how valence electrons create a chemical bond and formation of different types of chemical bonds
- 12.2 To draw the electron dot formula for a molecule
- 12.3 To determine the shape of a molecule by applying VSEPR Theory

Student Success in CHEM 1305

As with any three-hour course, expect to spend **at least six hours per week** outside of class reading and studying the material. I will provide assignments to help you use those six hours per week wisely. Additional time will be required for written assignments. Successful completion of this course requires a combination of reading the textbook, attending class, completing assignments in Eagle Online, and participating in class discussions. There is no short cut for success in this course; it requires reading, solving problems and studying the material using the course objectives as your guide.

Instructor and Student Responsibilities

As your Instructor, it is my responsibility to:

- Provide the grading scale and detailed grading formula explaining how student grades are to be derived
- Facilitate an effective learning environment through class activities, discussions, and lectures
- Provide a description of any special projects or assignments
- Inform students of policies such as attendance, withdrawal, tardiness and make up
- Provide the course outline and class calendar which will include a description of any special projects or assignments
- Arrange to meet with individual students before and after class as required

To be successful in this class, it is the student's responsibility to:

- Attend class and participate in class discussions and activities
- Read and comprehend the textbook
- Complete the required assignments and exams:
- Ask for help when there is a question or problem
- Keep copies of all paperwork, including this syllabus, handouts, and all assignments
- Attain a raw score of at least 70% on the final exam
- Be aware of and comply with academic honesty policies in the [HCCS Student Handbook](#)

Academic Integrity

You are expected to be familiar with the University's Policy on Academic Honesty, found in the catalog. What that means is: If you are charged with an offense, pleading ignorance of the rules will not help you. Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. Penalties and/or disciplinary proceedings may be initiated by College System officials against a student accused of scholastic dishonesty. "Scholastic dishonesty": includes, but is not limited to, cheating on a test, plagiarism, and collusion. There is a **Zero tolerance** for any type of academic dishonesty. Please see the following link for further information: [Student Handbook](#)

Exams and Assignments

Exams

Examinations will consist of four non-cumulative regular exams plus a comprehensive final. Make-up exams will not normally be given. Each exam contains 25 multiple choice questions of 3 points each and 5 partial credit questions of 5 points each. A grade received due to scholastic dishonesty can't be dropped. Please note that all students are required to take the final. Time allowed for all exams is two hours. Scantron is required for all exams. No bathroom breaks during an exam. HCC does not provide students with Scantron forms. They are sold in campus bookstores.

Written Assignment

Each chapter assignment is due before the start of the next chapter. Any assignment turned in late will be given reduced points.

End of Chapter Homework Problems

Chapter 1: 12,16,18,22,26,30,40.
Chapter 2: 6, 16, 29, 56, 57.
Chapter 3: 8, 14, 18, 60, 46.
Chapter 4: 20,23,38,42,44,70,72,78,80,86.
Chapter 5: 12, 30, 34, 36,48,56,62,74,76,80
Chapter 6: 4, 6, 12, 16, 24, 50, 54.
Chapter 7: 18, 48, 66, 70, 73.
Chapter 8: 6, 14, 20, 34, 42, 54.
Chapter 9: 8, 24, 46, 50, 76.
Chapter 10: 20, 26, 36, 64.

CHEM 1305 Final Exam

All students will be required to take a comprehensive final exam consisting of 25 multiple-choice and 6 short answer questions. Students must provide their own Scantron forms. All the information students need to prepare for the exam is in the review given in class or the [*Final Exam Handbook*](#).

Students who are absent from the final exam without discussing their absence with the instructor in advance or within 24 hours afterward will receive a final exam grade of zero. Any student who does not take a makeup exam by the end of the following long semester will receive a final exam grade of zero and a course grade of F.

Policy Regarding Making up Missed Assignments

"No makeups" for exams since instructor will drop the lowest exam between Exams 1, 2, 3 and 4. In the event of missing a regular exam, that exam will be dropped.

Grading Formula

The overall score is based on the following:

- Three regular exams = 60%
- Assignments = 20%
- Final Exam = 20%

Course Grade = $0.60(\text{Average of three regular exams}) + 0.20(\text{Assignments}) + 0.20(\text{Final Exam})$

Quizzes and/or homework will be part of the grade of a non-cumulative exam.

Grade	%
A	100-90
B	89-80
C	79-70
D	69-60
F	<59

HCC Grading Scale can be found on this site under HCC Grading System:
<http://www.hccs.edu/about-hcc/procedures/student-rights-policies--procedures/student-procedures/>

Course Calendar

Week #	Lecture
Week 1	Syllabus / Introduction Chapter 1 – Introduction to Chemistry and Prerequisite Science
Week 2	Chapter 2: The Metric System
Week 3	Chapter 3: Matter and Energy
Week 4	Exam 1
Week 5	Chapter 4: – Models of the Atom
Week 6	Chapter 5: The Periodic Table
Week 7	Chapter 6: Language of Chemistry
Week 8	Exam 2
Week 9	Chapter 7: Chemical Reactions
Week 10	Chapter 8: The Mole Concept
Week 11	Chapter 9: Chemical Equation Calculation
Week 12	Exam 3
Week 13	Chapter 10: Gases
Week 14	Chapter 11: Liquids and solids
Week 15	Exam 4
Week 16	Final Exam

Syllabus Modifications

The instructor reserves the right to modify the syllabus at any time during the semester and will promptly notify students in writing, typically by e-mail, of any such changes.

Other Course Information

HCC Online Information and Policies
<http://www.hccs.edu/online/>

EGLS³

The EGLS³ ([Evaluation for Greater Learning Student Survey System](#)) will be available for most courses near the end of the term until finals start. This brief survey will give invaluable information to your faculty about their teaching. Results are anonymous and will be available to faculty and division chairs after the end of the term. EGLS³ surveys are only available for the Fall and Spring semesters. -EGLS3 surveys are not offered during the Summer semester due to logistical constraints.

<https://hccsaweb.hccs.edu:8080/psp/csprd/?cmd=login&languageCd=ENG&>

HCC Email Policy

HCC prefers students to communicate only through the HCCS email system to protect your privacy. If you have not activated your HCCS student email account, you can go [to HCC Eagle ID](#) and activate it now. You may also use Canvas Inbox to communicate.

HCC Policy Statements

Here's the link to the HCC Student Handbook <http://www.hccs.edu/resources-for/current-students/student-handbook/> In it you will find information about the following:

- Academic Honesty
- Academic Information
- Academic Support
- Attendance, Repeating Courses, and Withdrawal
- Campus Carry
- Career Planning and Job Search
- Childcare
- Course Etiquette
- Disability Support Services
- Electronic Devices
- Equal Educational Opportunity
- Financial Aid TV (FATV)
- General Student Complaints
- Grade of FX and International Students
- Health Awareness
- Incomplete Grades
- International Student Services
- Libraries/Bookstore
- Police Services & Campus Safety
- Student Life at HCC
- Student Rights and Responsibilities
- Student Services
- Testing
- Transfer Planning
- Veteran Services

Basic Needs

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. Furthermore, please notify the professor if you are comfortable in doing so. Additional information may be found at: <http://www.hccs.edu/applying-and-paying/financial-aid/financial-coach/>

Office of Institutional Equity

Use the link below to access the HCC Office of Institutional Equity, Inclusion, and Engagement (<http://www.hccs.edu/departments/institutional-equity/>)

Disability Services

HCC strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please meet with a campus Abilities Counselor as soon as possible in order to establish reasonable accommodations. Reasonable accommodations are established through an interactive process between you, your instructor(s) and Ability Services. It is the policy and practice of HCC to create inclusive and accessible learning environments consistent with federal and state law. For more information, please go to <http://www.hccs.edu/support-services/disability-services/>

Title IX

Houston Community College is committed to cultivating an environment free from inappropriate conduct of a sexual or gender-based nature including sex discrimination, sexual assault, sexual harassment, and sexual violence. Sex discrimination includes all forms of sexual and gender-based misconduct and violates an individual's fundamental rights and personal dignity. Title IX prohibits discrimination on the basis of sex-including pregnancy and parental status in educational programs and activities. If you require an accommodation due to pregnancy please contact an Abilities Services Counselor. The Director of EEO/Compliance is designated as the Title IX Coordinator and Section 504 Coordinator. All inquiries concerning HCC policies, compliance with applicable laws, statutes, and regulations (such as Title VI, Title IX, and Section 504), and complaints may be directed to:

David Cross
Director EEO/Compliance
Office of Institutional Equity & Diversity
3100 Main
(713) 718-8271
Houston, TX 77266-7517 or Institutional.Equity@hccs.edu
<http://www.hccs.edu/departments/institutional-equity/title-ix-know-your-rights/>

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