CHEM 111-05

PRINCIPLES OF CHEMISTRY II

Lecture (CRN: 21809)

Spring 2023

COURSE DESCRIPTION

An introductory course in chemistry emphasizing theoretical aspects and designed primarily for students who intend to take one or more additional courses in chemistry. 3 credit hours.

Co-requisites/Prerequisites: (1) You must be concurrently enrolled in the lab or else have already passed the lab. If either is dropped, both must be dropped. The two courses (CHEM 111 & CHEM 111L) are graded independently of each other. The last day to drop with a grade of “W” is Friday, March 24. (2) Math Competency is assumed at the level of MATH 111 (Precalculus Mathematics), which includes algebra and graphing. Chem 111 requires Math 111 (co-req) or Math 111 exemption via the Math Placement Exam. If you do not currently meet these requirements, you probably shouldn’t be taking this course yet. (3) It is also assumed that you have had some prior chemistry in high school. If you have not, consider taking CHEM 103 as a prep to this course. CHEM 103 is offered during Express 2.

TEXTBOOK

Burdge, Julia and Overby, Jason Chemistry: Atoms First (McGraw-Hill), 4th edition [The next course in the Chemistry sequence, will cover the remaining chapters in the book. Do not sell your text at the end of the semester if you are continuing on to Chem 112. You do not need to bring the book to class]

COURSE OUTLINE

1. CHAPTER 1  Chemistry: The Science of Change
2. CHAPTER 2  Atoms and the Periodic Table
3. CHAPTER 3  Quantum Theory and the Electronic Structure of Atoms
4. CHAPTER 4  Periodic Trends of the Elements
5. CHAPTER 5  Ionic and Covalent Compounds
6. CHAPTER 6  Representing Molecules
7. CHAPTER 7  Molecular Geometry, Intermolecular Forces, and Bonding Theories
8. CHAPTER 8  Chemical Reactions
9. CHAPTER 9  Chemical Reactions in Aqueous Solutions
10. CHAPTER 10  Energy Changes in Chemical Reactions
11. CHAPTER 11  Gases
12. CHAPTER 12  Liquids and Solids
GENERAL INFORMATION

Meeting Times:
  Lecture: T, R 10:50–12:05, JSS 333

Instructor:
  Assoc. Prof. David Boucher
  Office: SSMB 322
  Phone: 953-6493
  E-mail: bouchezds@cofc.edu

Office Hours:
  Prof. Boucher will hold office hours in SSMB 322 on Tuesday (12:30-1:30), Wednesday (12-2), and Thursday (12:30-1:30), or by appointment.

Messages:
  Students may address questions and requests for appointments by contacting Prof. Boucher via email (bouchezds@cofc.edu).

OAKS:
  All important information regarding this course will be available on the OAKS webpage. This information includes all announcements and postings, lecture schedule and suggested reading assignments, lecture notes, exam answer keys, handouts.

ALEKS:
  This semester we will use McGraw-Hill ALEKS as an online general chemistry homework system and study module. These ALEKS assignments will be worth 10% of your final grade. You can access the section assignments by logging in to www.aleks.com and then using your credentials you can add a new course “CHEM 111 Spring 2023 - Section 05” using the code 3XUL4-NR4MU.

Attendance Policy and Classroom Conduct:
  Although the instructor will not be keeping a record of attendance, students are expected to attend all classes. Students are responsible for all information presented in class whether they are present or not. Students should obtain notes from a classmate and read the associated material in the text BEFORE they request help from the instructor about material missed.
  Please note that an Absence Memorandum from the Office of Undergraduate Studies only verifies your documentation for missing a class. It does not entitle you to make up or be excused from any work, assignment or test.
  In order to foster a cordial and secure learning environment, please be respectful of your instructor and your classmates. Do not obstruct or disrupt the teaching and learning processes by carrying on conversations on your cell phone or with other students in the class, sending text messages, or surfing the web on your laptop. Please set cell phones on mute or vibrate before coming to lecture. Do not verbally abuse, threaten, intimidate, or ridicule your instructor or classmates. If you fail to comply with these simple requests, you will be asked to
leave the class and if the problems persist you will be referred to the Dean of Students for disciplinary action.

**Quizzes:**

Four quizzes worth 20 pts each will be given. The dates of the quizzes will be determined by the pace of the lecture.

**Exams:**

Four exams will be given. The exams are tentatively scheduled to be administered on January 31, February 28, March 28, and April 20. *The exam with the lowest grade will be dropped prior to calculating your final grade.*

Absences from any exam must be arranged in advance. No make-up exams will be given. Students should contact Prof. Boucher as soon as possible regarding scheduling conflicts.

**Final Exam:**

A 70-question 110 minute comprehensive and standardized ACS final exam is scheduled for 1-3 pm on Saturday, April 29 in JSS 333. The multiple-choice final exam is cumulative over the material covered during the entire semester.

Requests for an alternate final exam time must be processed through the Office of Undergraduate Studies no later than 5 p.m. on the last day of class. Failure to take the final exam will result in a grade of "X" which turns to an "F" after 48 hours. Undergraduate students should be aware that excuses for missing final examinations may be obtained from the Office of Undergraduate Studies.

The acceptable reasons for missing final examinations are illness of the student (the student must provide documentation, e.g., an absence memo) or circumstances beyond the student's control. These reasons must be properly documented. See the section entitled "Final Examinations" in the Undergraduate Catalog for more information. Examinations must be taken at the time scheduled except when [a] two or more exams are scheduled simultaneously, or [b] the student has three examinations within a 24-hour period.

**Electronics Device Policy:**

No electronic devices except for calculators are allowed during exams. The use of any wireless communication devices, iPhones, iWatches, etc., during a test or the final exam is prohibited and will be considered to be a violation of the Honor Code.

**“Make-up” Policy and Regrades:**

As mentioned above, there are no make-up-tests for missed exams under any circumstances. If you have an emergency that is documented with a note from the Dean of Undergraduate Studies or a note from a medical doctor, you may be excused from an exam. Contact me as soon as possible.

Students may return exams they believe to have significant grading errors for reconsideration within one week of receipt of the graded exam. Students must submit clear and succinct explanations of the grading error(s) in question along with the exam to be regarded. The
explanation should establish that the answer key is incorrect or incomplete, that the answer given by the student is an equivalent or equally valid solution to that given on the key, or that the student gave the same answer as the key but it was not recognized as such. No markings or other alterations should be made on the exam itself. To ensure fair and equal treatment to all students, all changes in exam scores will be made only through this formal re-grade process. The professor will not discuss exam-score changes nor make exam-score changes in face-to-face meetings with students.

**HONOR CODE**

Student conduct is expected to conform to the standards of the College of Charleston Student Honor Code Policy. In addition, students in this course are also expected to be aware and to conform to the standards of the Department of Chemistry & Biochemistry Policy on Scientific Integrity.

Students at the College of Charleston are bound by honor and by their enrollment at the College to abide by the Honor and Conduct codes and to report violations. Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved.

Incidents where the instructor determines the student’s actions are related more to a misunderstanding will handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student’s file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student’s transcript for two years after which the student may petition for the X to be expunged. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

Students should be aware that unauthorized collaboration—working together without permission—is a form of cheating. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others’ exams, fabricating data, and giving unauthorized assistance.

Students can find the complete Honor Code and all related processes in the Student Handbook at [http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php](http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php).

**STUDENT DISABILITY/ACCESS STATEMENT**

This College abides by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act and will make reasonable accommodations for persons with documented disabilities. Students should apply for services at the Center for Disability Services/SNAP located on the first floor of the Lightsey Center, Suite 104, (843) 953-1431. If you have a documented
disability that may have some impact on your work in this class and for which you may require accommodations, you are responsible for notifying me as soon as possible and for contacting me one week before accommodation is needed.

**IMPORTANT DATES**

<table>
<thead>
<tr>
<th>DATE</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>Wednesday, January 11</td>
<td>First Day of Classes</td>
</tr>
<tr>
<td>Monday, January 16</td>
<td>Martin Luther King, Jr. Holiday (No classes)</td>
</tr>
<tr>
<td>Wednesday, January 25</td>
<td>Last Day to Drop/Add Courses</td>
</tr>
<tr>
<td>Tuesday, January 31</td>
<td>Exam #1</td>
</tr>
<tr>
<td>Tuesday, February 28</td>
<td>Exam #2</td>
</tr>
<tr>
<td>March 6-11</td>
<td>Spring Break (No classes)</td>
</tr>
<tr>
<td>Friday, March 24</td>
<td>Last Day to Withdraw with a Grade of “W”</td>
</tr>
<tr>
<td>Tuesday, March 28</td>
<td>Exam #3</td>
</tr>
<tr>
<td>Thursday, April 20</td>
<td>Exam #4</td>
</tr>
<tr>
<td>Tuesday, April 26</td>
<td>Last Day of Classes</td>
</tr>
<tr>
<td>Saturday, April 29</td>
<td>Final Exam (1-3 pm), JSS 333</td>
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**LEARNING OUTCOMES**

General chemistry provides you with an opportunity to do lots and lots of quantitative (numerical) and qualitative (conceptual) reasoning. General chemistry courses are often referred to as “baby” physical chemistry because they provide an introduction to the same material that is covered in the upper level physical chemistry courses, i.e., CHEM 341 and CHEM 342. At the end of CHEM 111 you should be able to use the tools of basic mathematics and physics to solve problems in chemistry and biochemistry. If someone poses a question about the physical basis of some chemical phenomenon, you should be able to apply your knowledge to suggest the appropriate theory or model to apply, be able to do the calculations necessary to apply the model and explain what you have done clearly and coherently so the person who asked the question has confidence that you know what it is you are doing. It would also be nice if, along the way, you gain some appreciation for the underlying beauty of the physical world. However, progress on this goal is hard for me to assess, so I’ll leave it up to you to decide how you are coming along.

Listed below are the learning outcomes for CHEM 111:

1. Describe how to employ the scientific method.
2. Solve chemistry problems by employing mathematical techniques and chemical reasoning.
3. Understand how atoms interact covalently and non-covalently to form molecules and compounds.
4. Identify the properties of compounds.
5. Employ an understanding of chemical reactivity to analyze chemical reactions.

**GENERAL EDUCATION STUDENT LEARNING OUTCOMES**

The General Education Learning Outcomes will be assessed in the lab co-requisite for the course, CHEM 111L.
1. Students apply physical/natural principles to analyze and solve problems.
2. Students explain how science impacts society.

**SEMESTER GRADES**

Semester grades will be calculated using the following criteria:

<table>
<thead>
<tr>
<th>Component</th>
<th>Grade Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALEKS</td>
<td>15%</td>
<td>The ALEKS grade is based on completion of the assignments.</td>
</tr>
<tr>
<td>Exams</td>
<td>60 %</td>
<td>Four in-class exams are scheduled on Tuesdays during the semester. Tentative dates are on the course calendar.</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25 %</td>
<td>A 70-question 110 minute comprehensive ACS final exam is scheduled for 1-3 pm on Saturday, April 29 in JSS 333.</td>
</tr>
</tbody>
</table>

Letter grades will be assigned based on straight grading scale shown in the table below.

<table>
<thead>
<tr>
<th>Score/%</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>93-100</td>
<td>A</td>
</tr>
<tr>
<td>90-92.9</td>
<td>A-</td>
</tr>
<tr>
<td>87-89.9</td>
<td>B+</td>
</tr>
<tr>
<td>83-86.9</td>
<td>B</td>
</tr>
<tr>
<td>80-82.9</td>
<td>B-</td>
</tr>
<tr>
<td>77-79.9</td>
<td>C+</td>
</tr>
<tr>
<td>73-76.9</td>
<td>C</td>
</tr>
<tr>
<td>70-72.9</td>
<td>C-</td>
</tr>
<tr>
<td>67-69.9</td>
<td>D+</td>
</tr>
<tr>
<td>63-66.9</td>
<td>D</td>
</tr>
<tr>
<td>60-62.9</td>
<td>D-</td>
</tr>
<tr>
<td>&lt; 60</td>
<td>F</td>
</tr>
</tbody>
</table>

The instructor reserves the right to increase a student’s grade if the instructor feels that it is warranted.

**Expectations of Students**

1. Attendance is expected at all classes. However, please do not attend in-person class if you are sick or under quarantine. Students are responsible for all information presented in class whether they are present or not. Students should obtain notes from a classmate and read the associated material in the text BEFORE they request help from the instructor about material missed.

2. It is of the upmost importance that you keep current in your studies. You are expected to spend a minimum of three hours of study for every hour spent in lecture. I am here to explain the material and help you to the best of my time and ability. However, the burden of learning is upon you, the student, which includes making use of tutors, supplemental instruction, and office hours.
Some Tips for Success in CHEM 111

1. **Prepare**: Do any assigned reading and suggested practice problems from the textbook and work on the ALEKS assignments before coming to class.

2. **Practice**: The only way to get good at solving problems is to practice solving problems. Watching someone else solve the problem or reading the solution cannot substitute for you putting pen to paper and trying to solve the problem on your own.

3. **Be consistent**: Develop a regular study schedule and learn the concepts as we discuss them in class. Chemistry is cumulative and it takes time for the concepts to sink in. You cannot cram chemistry.

4. **Think**: Chemistry needs to be understood, not memorized. Always ask yourself why you are doing a certain step in a problem or using a particular equation. Take responsibility for learning the material and be actively engaged.