Chemistry 1411 Course Syllabus

General Chemistry I: 4 credit hours Summer II 2017
CHEM 1411 Section 86002

INSTRUCTOR’S INFORMATION
Dr. Dwight Randle | Email: dwightrandle@dcccd.edu or Phone: 972-238-3795 | Office SH283
(Instructor reserves the right to amend this information as necessary.)

Class time and days:

<table>
<thead>
<tr>
<th>Section</th>
<th>Lecture</th>
<th>Room</th>
<th>Lab</th>
<th>Room</th>
<th>Final Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>86002</td>
<td>MTWR 11:50 AM – 1:50 PM</td>
<td>WH147</td>
<td>MTWR 2:00 PM – 4:00 PM</td>
<td>SH231</td>
<td>Thursday Aug. 10th 11:50 AM – 1:50 PM</td>
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</tbody>
</table>

Evaluation Procedures: Your final course grade will be determined by the total number of points accumulated from all assignments. Total possible points = 975.

A = 90% or above:
B = 80% or above
C = 70% or above
D = 60% or above
F = 59% or below

Points are earned from the following:
4 exams @ 100 ea. 400 points
1 final exam 200 points
13 labs @ 25 ea. 325 points
Science writing 50 points

Required Materials:

2. Splash-resistant safety goggles for lab work.
3. Scientific Calculator

Note: Mastering Chemistry is not required for this course.
## Course Schedule

<table>
<thead>
<tr>
<th>Lecture</th>
<th>July 11</th>
<th>July 12</th>
<th>July 13</th>
<th>July 14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syllabus</td>
<td>CH 1 – Intro, Atoms</td>
<td>CH 2 - Measurement, Problem Solving, the Mole</td>
<td>CH 3.1 -3.4 - Quantum Mechanical Atomic Model</td>
<td>CH 3.5 - 3.6 - Quantum Mechanical Atomic Model</td>
</tr>
<tr>
<td>Lab</td>
<td>Lab Safety, MSDS, Measurements &amp; Sig Figs</td>
<td>Mole Concept Sections I-IV Syllabus Quiz</td>
<td>Identification of an Ionic Compound</td>
<td>Light, Quantization, and the Hydrogen Atom Chemistry in the News #1</td>
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<thead>
<tr>
<th>July 17</th>
<th>July 18</th>
<th>July 19</th>
<th>July 20</th>
<th>July 21</th>
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</thead>
<tbody>
<tr>
<td>Exam on Chapters 1 – 3</td>
<td>CH 4.5 - 4.8: Periodic Trends CH 5.1 - 5.5: Molecules &amp; Compounds</td>
<td>CH 5.6 - 5.11: Molecules &amp; Compounds</td>
<td>CH 6.1 - 6.6: Lewis Structures</td>
<td>Chemistry in the News #2</td>
</tr>
<tr>
<td>CH 4.1 - 4.4: Periodic Props of the Elements</td>
<td>Properties of Select Main Group Oxides in Aq Solution (Prelab only)</td>
<td>Identification of a Pure Substance</td>
<td>Lewis Structures: Formal Charge &amp; Resonance</td>
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</tbody>
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<tr>
<th>July 24</th>
<th>July 25</th>
<th>July 26</th>
<th>July 27</th>
<th>July 28</th>
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</thead>
<tbody>
<tr>
<td>Exam on Chapters 4 – 6.6</td>
<td>CH 7: Valence Bond Theory Omit 7.4, MO Theory</td>
<td>CH 8.1 - 8.4: Stoichiometry</td>
<td>CH 8.5 - 8.6: Limiting Reactant Stoichiometry</td>
<td>Chemistry in the News #3</td>
</tr>
<tr>
<td>CH 6.7 - 6.10: VSEPR</td>
<td>Lewis Structures: Molecular Geometry</td>
<td>Preparation of Alum</td>
<td>Electrolytes: Pure Substances and Aqueous Solutions</td>
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<thead>
<tr>
<th>July 31</th>
<th>Aug 1</th>
<th>Aug 2</th>
<th>Aug 3</th>
<th>Aug 4</th>
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</thead>
<tbody>
<tr>
<td>Exam on Chapters 6.7 – 8</td>
<td>CH 9.6 – 9.9: Ionic Equations, Redox</td>
<td>CH 10.1 – 10.7: Thermochemistry</td>
<td>CH 10.8 – 10.11: Enthalpy of Reaction</td>
<td>Chemistry in the News #4</td>
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<tr>
<th>Aug 7</th>
<th>Aug 8</th>
<th>Aug 9</th>
<th>Aug 10</th>
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</thead>
<tbody>
<tr>
<td>Exam on Chapters 9 – 10</td>
<td>CH 11.4 – 11.7: Gases</td>
<td>CH 11.8 – 11.11: Gases</td>
<td>FINAL EXAM Chapters 1 to 11</td>
</tr>
<tr>
<td>CH 1.1 – 11.3: Gases</td>
<td>Gasometric Analysis: % Bicarbonate in Alka-Seltzer</td>
<td>Review for Final</td>
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</tbody>
</table>
Exams: Exams include information and concepts presented in lecture as well as lab techniques and equipment. Exam questions are carefully chosen from a multiple-choice, short answer or calculation question test bank. No partial credit will be given for multiple-choice questions. Short answer exam questions, fill-in-the-blank or problems solving questions may require that you show your work to receive credit. No device capable of connecting to the internet is allowed during exams. Calculators cannot be shared between students during exams. Student must provide scantron form (form 882-E, the long green form) for all exams. Once you receive an exam, you cannot leave the room until you have completed the exam or the time runs out. There are usually 20 - 35 questions on each exam with the total available points distributed among the questions. There is no make up for exams (including the final exam).

Homework: If homework is assigned, the assignments are extra credit and will consists of problems from the end of the chapters in our textbook. Homework will be graded using a random sample method. Half the homework points will be earned by doing and turning in the homework before the due date. Students earn the remaining half of the points correctly answering the randomly select question. Since students do not know which question will be selected for grading, it is in the student’s best interest to do their best with every question. While not all questions will be individually graded, students are encouraged to talk with the professor about any homework question that they are not able to solve.

Class Participation: During lecture, I will ask you to work with a partner and solve a problem or answer a question pertinent to the day’s lecture topic. Your full participation and cooperation is expected. If points are earned for participating in in-class activities, you must be present and engaged in the activity to receive points.

Grading Disputes: Disputes regarding grades on assignments or exams must be brought to the attention of the instructor not more than 7 calendar days after the assignment/exam has been posted in eCampus. Discussions about grades are private discussions and must be done in the instructor’s office such that student privacy is maintained.

Technology Policy: Devices capable of connecting to the internet can be a distraction in class. In an effort to maintain an environment conducive to teaching and learning, the
use of devices such as tablets, smartphones and the like is prohibited. The in-class use of technology for work directly related to that day’s class work is allowed only with the prior permission of the instructor. The use of technology for phone calls, texting, posting or capturing audio, still or video images, the use of social media or any activity not directly related to class work is prohibited during lecture, lab and exams. You are free to step out of the room during lecture or labs if you need to take or place a call. Calculators are allowed in exams. No device capable of connecting to the internet is allowed in exams. Calculators cannot be shared during exams or quizzes.

**Lab:** Pre and post lab assignments are completed on eCampus. Prelabs are due at the time the lab is scheduled to begin. Post labs are due at the time the lab is scheduled to end unless otherwise stated. Lab groups must consist of 2 members only. Groups of more than 2 must be approved by the professor before starting any lab work. Although students work with a partner in the lab, each student turns in an individual lab report to be graded. Lab reports consist of a pre lab questions and a post lab questions. Prelabs and post labs are submitted and graded via eCampus website. Hard copies of each is due at the end of the lab period and serves as backup to the online grading and also serves as confirmation that you attended and completed all of the lab activities. Any data you collected during the lab is recorded on the hard copy report and is not usually submitted online. Online pre-labs are due before the lab begins. The post lab is due no later than 15 minutes after the lab ends. Lab points are usually distributed in the following way:

- Pre lab (10 points), Lab Activity (10 points) and Cleanup (5 points).

The written pre-lab from your lab manual must be completed before lab time and is due 10 minutes after the start time for the lab. If the pre-lab assignment asks for a "checklist", you must write out directions for the lab experiment with sufficient detail to demonstrate that you have read and are prepared to complete the lab activities. Complete sentences are not necessary; you may use an outline or pictures or lists, etc. Xeroxed pages from the lab book will not be graded! You must buy safety goggles and --bring them to the lab each week, or leave them in the drawer assigned to your lab section.

**If you are absent from a lab you cannot receive points for that lab.** You may make up a missed lab by attending another 1411 lab section doing that same lab experiment. A
schedule of 1411 labs is posted in the lab room. That lab instructor will initial and date your pre-lab and lab papers and turn in those papers to me by leaving them in my box in the lab prep area. Do not abuse this privilege. Go to your assigned lab section if at all possible. You will be asked to document the reason for your absence.

**Announcements & Attendance Policy:** Activities in class can lead to bonus points, so it is to the student's advantage to come to class. In general, announcements will be made in class. Additional announcements may be posted and/or emailed through eCampus when needed. Each student is responsible for checking postings and maintaining current email address in eCampus to be aware of all announcements.

**Units of Instruction/Exam Calendar:**

- Exam 1: over chapters 1, 2 & 3
- Exam 2: over chapters 4, 5, & 6.1-6.6
- Exam 3: over chapters 6.7, 7 & 8
- Exam 4: over chapters 9 & 10
- Final Exam over chapters 1 – 11; see final exam schedule on page 1.

Instructor reserves the right to alter this schedule, as needed.

**Instructor Policies and Suggestions for Student Success:**

**How to Succeed in this Course:**

1. **Study:** Plan to study two hours outside class for each hour you send in class, or about 8 hours per week. Your study time should be at a regular planned time and spread throughout the week, not all day on Sunday.

2. **Read:** Read the sections from the text that will be covered in the lecture before you come to lecture so you will be familiar with the vocabulary and know the areas that may be difficult for you. Jot down your questions as you read. If your questions are not answered during lecture, then ask it in class or see me during an office hour or ask me during lab for clarification. You will also find knowledgeable tutors in the Science Corner across from SH278. Consult the posted schedule for times when chemistry tutors are available.

3. **Warm up before an exam:** Just as an athlete stretches and warms up before competition, warming up immediately before an exam will help engage and focus your problem-solving left brain which will help you perform better on
exams. I suggest that you work 2-3 problems from the relevant chapter(s) in the 10-15 minutes prior to taking the exam.

4. **Working problems is a great way to practice:** Following most sections in the chapter, there are problems to work for practice. Answers for the problems are at the end of each chapter.

5. **Do your homework:** Work the assigned end-of-chapter problems on the Connect website and submit your scores on or before you take an exam on that chapter.

6. **Keep up with the lab work:** Prepare for lab by reading the procedure in advance and completing the pre-lab assignment in your manual before you come to lab. Remember, exams may contain questions from lab experiments.

**College Policies and Procedures:**

For Institution Policies, please refer students to the Richland website www.richlandcollege.edu (Current Students) or to www.richlandcollege.edu/syllabusinfo/syllabiInformation.pdf

**COURSE DESCRIPTION**

This course is for science and science-related majors. Fundamental concepts of chemistry are presented including measurement and the metric system, the history of chemistry, the mole concept, chemical reactions and stoichiometry, energy and chemical reactions, states and properties of matter, the periodic table, chemical bonding, atomic and molecular structure, gas laws, and concentrations of solutions.

Coordinating Board Academic Approval Number 4005015203

**COURSE OBJECTIVES**
1. Describe the fundamental particles of matter; relate basic laws and theories to their behavior, utilize a systematic method of naming compounds and polyatomic ions (Chapter 1).

2. Perform calculations related to topics included in Chemistry 1411 (Chapter 2).
   a. Be able to express, interpret, and utilize relationships between variables
   b. Solve problems using complete, thorough setups with metric and SI units
   c. Utilize data, including graphs, and interpret results

3. Investigate the quantum mechanical model of the atom, write and interpret quantum numbers for the electrons in an atom. Write electronic configurations and predict chemical properties (Chapter 3).

4. Recognize the correlation between electronic structure and the organization of the periodic table. Be able to predict properties and account for periodic trends (Chapter 4).

5. Differentiate between ionic and molecular compounds, write Lewis formulas, and account for differences in properties (Chapter 5).

6. Utilize the VSEPR theory to predict the shapes of molecules, account for the effect of lone electron pairs and multiple bonds (Chapter 6).

7. Describe molecular orbitals using hybridization, distinguish between sigma and pi bonds, and account for properties using the molecular orbital theory (Chapter 7).

8. Write and balance chemical equations, perform calculations related to Stoichiometry and classify the different types of chemical reactions (Chapter 8).

9. Apply principals of concentration, stoichiometry, solubility, and the basic types of reaction to chemistry in solution (Chapter 9).

10. Define enthalpy and entropy, determine methods of measurement of enthalpy, and perform related calculations (Chapter 10).

11. Determine the relationship between pressure, volume and temperature of gases and perform related calculations (Chapter 11).
Core Curriculum Intellectual Competencies

*Reading*: The ability to analyze and interpret a variety of printed materials (books, documents, and articles) above 12th grade level. Your textbook is written on a level above 12th grade and requires that you interpret graphs, charts, and figures, as well as text.

*Listening*: Analyze and interpret various forms of spoken communication, possess sufficient literacy skills of writing and reading above 12th grade level. The lecture format requires you to listen critically and take notes.

*Critical Thinking*: Rely on reason and use strategic approach to uncover meaning or undergird understanding. Every chemistry problem is a word problem. You will learn to extract necessary data from a problem, disregard irrelevant data, select the appropriate chemical law for its solution, and apply that relationship.

**CORE CURRICULUM STATEMENT**

*To identify and apply appropriate methods and technology to the study of chemistry*: For example, you will graph your data and determine the best straight line when it is appropriate. You will sometimes use the Lab Works Interface to collect your data, but only after the device has been properly calibrated.

*To recognize scientific and quantitative methods and the differences between these approaches and the other methods of inquiry and to communicate findings, analyses, and interpretation both orally and in writing*: Quantitative methods always require you to take measurements and record data. Some of your labs this semester will be quantitative, requiring data and calculations; but some labs will be qualitative, requiring observations and subjective descriptions. For the quantitative labs you may compare your results to values recorded in chemical reference books. Discussions with your lab partner(s) to reach a consensus on the written lab report will give you practice in communicating your results.

*To identify and recognize the differences among competing scientific theories*: For example, various interpretations of the atomic theory are used, depending on the information needed: the Bohr (solar system) model for looking at shells of electrons, the valence bond theory for determining shapes of molecules, and the molecular orbital theory for a closer examination of electron location.
To demonstrate knowledge of the major issues and problems facing modern science, including issues that touch upon ethics, values, and public policies: You are encouraged to bring in newspaper articles that raise issues related to modern science. In the past this has included: acceptable levels of arsenic in drinking water; ethanol as an alternative fuel to gasoline; ozone levels; and most recently, the use of chlorine oxides to de-contaminate the Senate building from anthrax spores.

To demonstrate knowledge of the interdependence of science and technology and their influence on, and contribution to, modern culture: Science impacts our everyday lives in many ways, but one example is the FDA requirement that chemical contents of all foods and drugs be listed on the label. As you learn the chemical vocabulary, these will become more meaningful.

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