1. Course Number, Title, Semester, and Year

CHEM.110-001, -002, -003; General Chemistry I; Spring 2010

**Prerequisite:** MATH.150 Finite Mathematics or 3 years of high school mathematics, a passing score on the mathematics entrance exam, and inclusion in the University’s Honors Program.

The course is a first-level course in the university's General Education Program Curricular Area 5 (GEPCA). Successful completion of the course will allow you to choose among General Chemistry II, The Human Genome, Oceanography, Human Biochemistry and Health, Environmental Chemistry, How the Universe Works Environmental Resources and Energy, Earth Sciences, University Physics II, College Physics II, and Astronomy as second level choices in order to complete the GEPCA 5 requirement.

2. Instructors, Address, Telephone Number, and Office Hours

**Course Instructor:** Dr. Mark Oram, BH 401, 202-885-1780

**Office Hours:** Tues. and Fri. 10:00 am – noon: “open door” and any time by appointment

**email:** oram@american.edu

**Lab Coordinator (The Boss):** Dr. Jane Ferguson, BH 106 (202-885-1761)

**email:** ferguson@american.edu

**Teaching Assistant:** To be announced

3. Introduction

This course is an introduction to freshman chemistry, with material designed to stretch your mind. The course builds a foundation of vocabulary and conceptual knowledge in the basic areas of chemistry: atomic and molecular structure, stoichiometry, energy relationships, chemical bonding and the states of matter. This first semester of a two-semester sequence of chemistry courses for general education will provide you with an informed understanding of the aspects of chemistry mentioned above, and will show how scientific concepts and thought processes deal with current issues in science. This course meets the requirements of a first-level course in the General Education Program, and in that regard it will improve your quantitative and computing skills.

The means of instruction consist of two 75 min lectures and a lab session of 3 hrs every week:

Lectures are in Beeghly Rm 1 at **8.30 – 9.45 am Tuesdays and Fridays** (for ALL sections)

Laboratories are in Beeghly 105:

<table>
<thead>
<tr>
<th>Section</th>
<th>Time</th>
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<tbody>
<tr>
<td>001</td>
<td>Tues. 09:55 am - 12:35 pm</td>
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<tr>
<td>002</td>
<td>Tues. 01.15 pm - 04:15 pm</td>
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<tr>
<td>003</td>
<td>Tues. 04.30 pm – 07.30 pm</td>
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4. Textbooks and Supplies. Both books should be available from the bookstore.

**Required**


- **Option 2:** If you purchased a used textbook, go directly to the website and purchase Mastering Chemistry, which gives you the option of also purchasing the ebook, if you wish.

- LAB MANUAL:  CHEM 110/110G  Chemical Education Resources (see Dr. Ferguson)

- Laboratory Notebook with numbered pages and carbons

- Scientific Calculator (capable of natural and base-10 logs and exponents; simpler is often better)

- A computer capable of running the Mastering Chemistry program.

**Suggested**

- Molecular Model Kit #1A by Darling Models ([www.darlingmodels.com](http://www.darlingmodels.com); about $15)

- Home computer with anti virus software

- ChemDraw ([www.camsoft.com](http://www.camsoft.com))

5. Teaching Methodology

**Lecture:** Lectures, assisted with PowerPoint and demonstrations, will constitute the major form of instruction for this course. A great deal of attention will be paid during lecture to homework problem assignments from the problem sets at the end of each chapter. **Most of the exam material will be drawn from these problem assignments, so it will benefit you to complete them all.** If you are going to do well in the course and learn chemistry, then you do need to work problems.

The importance of advance reading cannot be over-emphasized. Advance reading is very helpful for a thorough comprehension of the course, and helps you comprehend the material faster, so you will not be lost during the lectures. You should also do the example problems as they occur throughout each chapter. Use a sheet of paper to block out the solutions, and then verify your answer. Then try the practice exercises. If you have any difficulty with the problems, they can be discussed during the lecture, with me during office hours, or with your teaching assistant. **Please take full advantage of these opportunities.**

**Homework:** Homework assignments will be made – and you will submit the assigned problem answers - on-line with the Mastering Chemistry program. You need to familiarize yourself with the program as soon as possible – it is user friendly, and you will find within the program how grading is accomplished with the program. Homework assignments should take about two hours of work per chapter. By way of full disclosure, this is the first semester I have used this on-line homework system, so there may or may not be some bumps!

**Laboratory:** Dr. Ferguson is the boss of the laboratory portion of this course. The tentative schedule of lab experiments is at the end of this syllabus, and during the first lab session Dr. Ferguson will provide you with a detailed syllabus for the lab portion of the course covering all aspects of the laboratory operations.

If you have any questions that you would like discussed (about problems, concepts, material, etc) please raise them with Dr. Oram during lecture, via email or during office hours.
6. Exams, Grades and Grading Policy

**Homework:** (15 % of your final grade)

I will record a grade for each chapter’s assignments as a percent of the total possible points for that chapter’s assignment. For example, if a chapter’s assignments point total was 15 and you scored 13 points, the grade recorded for that chapter’s homework would be 87 (86.7 rounded up).

**Exams:** (60 % of your final grade: 35 % term exams and 25 % final exam)

There will be three 75 min exams throughout the course and one 2.5 hr final exam based on material covered in the lectures, the textbook, and the end-of-chapter homework assignments.

Exams from previous semesters will be posted on the Blackboard website for this course. If you can handle the homework assignments, you will do very well on the exams. See me if you need more help.

**Please note that there are no makeup exams (except under the most extraordinary circumstances)**

**Laboratory:** (25 % of your final grade)

The laboratory grade will be determined on the basis of successful completion of the 11 assigned experiments and the associated quizzes.

**Final Grade:** The lecture part of this course will account for 75 % of the final grade.
The laboratory section is worth the remaining 25 %.

A grade of **A** (90-100 %) in this course will imply that you have mastered the full range of topics covered in the lectures and can apply these to correctly solve the problems given. You can derive the key factors that lead to the best solution and make particularly insightful contributions to class discussions.

A grade of **B** (80-89 %) will imply that you have a thorough understanding of the subject. You can think things through and make helpful contributions to class discussions.

A grade of **C** (70-79 %) would imply that you understand the subject matter at least in outline but there are gaps in the scope and depth of understanding.

A grade of **D** (60-69 %) implies that you have only partial knowledge of the subject. Your ability to make effective use of this knowledge will likely be of limited value.

A grade of **F** (less than 60 %) is a failing grade, but I will be working closely with anyone whose early scores suggest that –**IF** left unchecked – a total less than 60 % is possible.
7. Academic Integrity Policy

Standards of academic conduct are set forth in the University's Academic Integrity Code, which can be found in the University catalogue or obtained from the Office of the University Registrar. By registering, you have acknowledged your awareness of the Academic Integrity Code, and you are obliged to become familiar with your rights and responsibilities as defined by the Code. Violations of the Academic Integrity Code will not be treated lightly, and disciplinary actions will be taken should such violations occur. These violations include plagiarism or receiving inappropriate assistance on examinations and laboratory assignments. Cheating is an extremely serious academic offense. Allegations of cheating will be referred to the Undergraduate Dean of the College of Arts and Science for appropriate action. Please see me if you have any questions about the academic violations described in the Code or as they relate to particular requirements of this course.

8. Emergency Preparedness

In the event of a declared pandemic (influenza or other communicable disease), American University will implement a plan for meeting the needs of all members of the university community. Should the university be required to close for a period of time, we are committed to ensuring that all aspects of our educational programs will be delivered to our students. These may include altering and extending the duration of the traditional term schedule to complete essential instruction in the traditional format and/or use of distance instructional methods. Specific strategies will vary from class to class, depending on the format of the course and the timing of the emergency. Faculty will communicate class-specific information to students via AU e-mail and Blackboard, while students must inform their faculty immediately of any absence due to illness. Students are responsible for checking their AU e-mail regularly and keeping themselves informed of emergencies. In the event of a declared pandemic or other emergency, students should refer to the AU Web site (www.prepared.american.edu) and the AU information line at (202) 885-1100 for general university-wide information, as well as contact their faculty and/or respective dean’s office for course and school/college-specific information.
9. Schedule for the laboratory exercises

Lab schedule is subject to change, but all changes will be announced in lab and posted on Blackboard

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<tr>
<th>CHEM - 110/110G</th>
<th>Tentative LAB Schedule</th>
<th>Spring 2010</th>
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<tbody>
<tr>
<td>Week</td>
<td>Week of</td>
<td>Lab Topic</td>
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<tr>
<td>1</td>
<td>Jan 11</td>
<td>Check-in/Safety video/Syllabus Discussion</td>
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<tr>
<td>2</td>
<td>Jan 18</td>
<td>Separating and Identifying Food Dyes By Paper Chromatography</td>
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<tr>
<td>3</td>
<td>Jan 25</td>
<td>Determining the Empirical Formula of Magnesium Oxide</td>
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<tr>
<td>4</td>
<td>Feb 1</td>
<td>Writing and Balancing Chemical Equations</td>
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<td>5</td>
<td>Feb 8</td>
<td>Nine Bottles: An Adventure in Chemical Identification</td>
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<td>6</td>
<td>Feb 15</td>
<td>Determining the Acid-Neutralizing Capacity of Common Antacids</td>
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<tr>
<td>7</td>
<td>Feb 22</td>
<td>The Global Carbon Cycle and Leaf Decomposition*</td>
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<tr>
<td>8</td>
<td>Mar 1</td>
<td>Temperature Change, Heat of Reaction, and Enthalpy Change</td>
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<tr>
<td>9</td>
<td>*Spring Break</td>
<td></td>
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<tr>
<td>10</td>
<td>Mar 15</td>
<td>Making Hot and Cold Packs</td>
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<tr>
<td>11</td>
<td>Mar 22</td>
<td>Determining the Effect of Cooking on Vitamin C* Content</td>
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<tr>
<td>12</td>
<td>Mar 29</td>
<td>Synthesizing Alum &amp; Observing Some Chemistry of Aluminum</td>
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<tr>
<td>13</td>
<td>Apr 5</td>
<td>Molecular Geometry and Bonding</td>
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<tr>
<td>14</td>
<td>Apr 12</td>
<td>Spectrophotometric Studies of Dye Solutions</td>
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<tr>
<td>15</td>
<td>Apr 19</td>
<td>Molar Mass of a Volatile Liquid Cleanup and Check Out</td>
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*Lab reports will be due in these labs