CHM136: General Chemistry II  
York College of PA

Instructor: Dr. James B. Foresman  
Office: C-213 (815-1384)  
Office Hours: MW 9-11, TR 1-2

Semester: Spring 2015  
Email: jforesma@ycp.edu  
Skype: james.foresman

Textbook

Course Web Page
http://faculty.ycp.edu/~jforesma/educ/gchem/chm136.htm

Catalog Description
General Chemistry II is a continuation of CHM 134. This semester is a study of gas laws, states of matter, thermodynamics, acids and bases, ionic equilibria, electrochemistry, nuclear chemistry, and descriptive chemistry of the elements. 3 class periods. 1 three-hour laboratory period (CHM137).

Prerequisite: Students in this course should have successfully completed CHM 134 with a grade of 2.0 or higher.

Required Materials
It will be essential for you to have your own hand-held calculator (that can perform log functions and exponential notation) for homework, classwork, and examinations. If you are unsure your calculator meets the requirements, please see the instructor. Also, you are expected to keep a notebook for all homework assignments.

Special Accommodations
If you are a student with a disability in need of classroom accommodations and have not already registered with Linda Miller, Disability Support Services Coordinator, please contact her at 815-1785 or lmille18@ycp.edu to discuss policies and procedures related to disability services and to establish the accommodations for which you are eligible.

Policy Concerning Personal Technology Devices
While York College recognizes students’ need for educational and emergency related technological devices such as laptops, PDA’s, cellular phones, etc., using them unethically or recreationally during class time is never appropriate. The college recognizes and supports faculty members’ authority to regulate in their classrooms student use of all electronic devices.

Area Distribution Requirement and Course Objectives
General Chemistry II satisfies Area III, which represents the Laboratory Sciences, of York College’s Area Distribution Requirements. Each area of the ADR has a unique set of goals and learning objectives. Through the process of completing your ADR courses, you will hopefully gain a broad perspective, across many academic disciplines, of how different segments of society study and address the myriad issues we all face in our lives. All courses that satisfy ADR III contribute to the Mission Statement for General Education at York College by using inquiry-based learning to educate students on the nature and process of scientific investigation so that students may confidently approach scientific issues as they arise in the workplace or in a societal or global context. It is expected that after you have completed your work in ADR III you should, for one or more scientific disciplines, demonstrate the ability to:

1) Examine the natural world and critically evaluate observations in the context of current scientific understanding;
2) Solve problems and/or exhibit an understanding of the scientific method, through the capacity to describe and predict natural processes and to conduct and analyze experiments;
3) Discern how science relates to contemporary societal or global issues.

While the outcomes listed above apply to all courses satisfying ADR III, General Chemistry II has its own set of objectives to help you accomplish them. As you read through the following major course objectives, you will notice that each is followed by one or more number in parentheses – these indicate the ADR outcomes form above that each objective targets:

Objectives
It is an overall goal of this course to improve the problem solving and mathematical skills of all students enrolled. Oral and written communication skills should also be improved by the exercises in the laboratory portion of the course. In addition, students successfully completing this course should be able to:
1. quantitatively interpret the behavior of ideal gases (1, 2, 3)
2. predict properties of liquids based on their molecular structure (1, 2, 3)
3. use a phase diagram to discuss changes of state at different pressures (1, 2, 3)
4. explain and interpret the effects of hydrogen bonds formed in water (1, 2, 3)
5. deduce a rate law from experimental reaction data (1, 2, 3)
6. use the rate law to determine concentrations of species at a specified time (1, 2, 3)
7. explain the influence of catalysts on certain reaction rates (1, 2, 3)
8. discuss reaction mechanisms and their connection to reaction rates (1, 2)
9. write and use equilibrium expressions for chemical reactions (1, 2)
10. calculate final concentrations of species involved in an equilibrium (1, 2, 3)
11. predict changes to equilibria subjected to an external disturbance (1, 2, 3)
12. predict the solubility of salts in aqueous solution (1, 2, 3)
13. understand the pH scale and its application to acid-base chemistry (1, 2, 3)
14. design and prepare buffers to control the pH of aqueous solutions (1, 2, 3)
15. define the terms enthalpy, entropy, and free energy (1, 2)
16. apply the First and Second Laws of Thermodynamics (1, 2)
17. use Hess’s Law and thermodynamic tables to predict the heat of reaction (1, 2, 3)
18. predict the spontaneity of reactions using free energy data (1, 2, 3)
19. relate free energies to chemical equilibria (1, 2, 3)

Attendance Policy
It will be essential for you to attend class regularly. If you are absent from class, it will be your responsibility to contact me before the start of the next class meeting to receive information about topics covered or important announcements that you may have missed. As college policy dictates, if you stop coming to class but fail to drop the course, I must notify the administration – you may be at risk of losing any financial aid you receive in this event. There is no credit associated with attending class as far as your grade is concerned.

Examinations
There will be three in-class, closed-book examinations. The lowest score among these exams will be dropped when computing the total course average. A missed exam that results from an excused absence must be taken before the start of the next class period following the exam. Excused absences will be granted only in the most extreme of circumstances (for the most part, a missed exam counts as your drop). If you are going to miss an exam, you must contact the instructor in advance of the exam hour (email is fine) in order to be excused.

A final, comprehensive examination will also be given (see schedule). All students must complete this exam (the score obtained can not be dropped).

Homework Problems:
Each chapter of material covered in this course has an accompanying set of exercises on the masteringchemistry.com. The Course ID for your course is MCFORESMAN136S2015. You will need to enter this in order to be placed into the correct section.

Laboratory Work
A separate syllabus will be distributed that describes this part of the course. This course must meet the requirements for ADR III laboratory science, therefore a grade of 50% or lower in lab will result in a grade of “0” for the course.

Academic Standards
York College’s mission statement stipulates that strict adherence to principles of academic honesty is expected of all students. Therefore, academic dishonesty will not be tolerated at York College. Academic dishonesty refers to actions such as, but not limited to, cheating, plagiarism, fabricating research, falsifying academic documents, etc., and includes all situations where students make use of the work of others and claim such work as their own.

I will ask you to affix your name to any work which is being submitted for credit. Your signature on your paper will then be interpreted as your claim that the work is entirely your own. Any assistance that you have obtained from other students, other faculty, or any reference material (in short anything which is not your original words or ideas) must have a proper citation recognizing the person and/or reference material.

When I believe a student has committed an act of academic dishonesty, I will inform that student in writing and then within ten business days I will report the incident to the Dean of Academic Affairs and the Physical Sciences Department Chair. Documentation related to instances of academic dishonesty will be kept on file in the student’s permanent record. If the academic dishonesty is the student’s first offense, I will have the discretion to decide on a suitable sanction up to a grade of 0 for the course. Students are not permitted to withdraw from a course in which they have been accused of academic dishonesty.

Students who believe they have been unjustly charged or sanctioned (in cases involving a first offense) must discuss the situation with me and have 10 business days thereafter to submit an appeal to the Student Welfare Committee through the Dean of Academic Affairs. If an appeal is filed, the Student Welfare Committee will then conduct a hearing to review the charge and/or sanction. In cases of a first offense, I may request that the
Student Welfare Committee conduct a hearing and decide on the sanction, which can involve academic suspension or dismissal from the College, if I believe the offense to be of an extremely egregious nature.

If the Dean of Academic Affairs determines that the academic dishonesty is the student’s second offense, the Dean will provide written notification to the student, the faculty member, and the Department Chair. The Student Welfare Committee will automatically conduct a hearing to review the charge and decide on an appropriate sanction, which will involve academic suspension or dismissal from the College. Students who believe the Student Welfare Committee has unjustly sanctioned them may submit a written appeal to the Dean of Academic Affairs within 72 hours of receiving notification of the Student Welfare Committee’s sanction.

**Communication Standards**
As recommended by the Faculty Senate and stated in the College Faculty Manual: “York College recognizes the importance of effective communication in all disciplines and careers. Therefore students are expected to competently analyze, synthesize, organize, and articulate course material in papers, examinations and presentations. In addition, students should know and use communication skills current to their field of study, recognize the need for revision as part of their writing process, and employ standard conventions of English usage in both writing and speaking. Students may be asked to further revise assignments that do not demonstrate effective use of these communication skills.”

**The Grade**
At the end of the course, each student will be assigned one of the following grades based on three 100 point exams (60%), 100 points of homework (20%), and 100 points of labwork (20%). Because of extra credit, it is possible to earn more than 100 points for homework, however 100 is the maximum that will count toward the total grade. Here is the scale to be used:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0</td>
<td>470-500</td>
</tr>
<tr>
<td>3.5</td>
<td>440-469</td>
</tr>
<tr>
<td>3.0</td>
<td>410-439</td>
</tr>
<tr>
<td>2.5</td>
<td>380-409</td>
</tr>
<tr>
<td>2.0</td>
<td>350-379</td>
</tr>
<tr>
<td>1.0</td>
<td>290-349</td>
</tr>
<tr>
<td>0.0</td>
<td>0-289</td>
</tr>
<tr>
<td>W</td>
<td>see below</td>
</tr>
<tr>
<td>I</td>
<td>see below</td>
</tr>
</tbody>
</table>

**4 (Excellent):** This grade denotes accomplishment that is truly distinctive and decidedly outstanding. It represents a high degree of attainment and is a grade that demands evidence of originality, independent work, an open and discriminating mind, and completeness and accuracy of knowledge, as well as an effective use of the knowledge.

**3.5 (Very Good):** This grade denotes mastery of the subject matter. It represents very good achievement in many aspects of the work, such as initiative, serious and determined industry, the ability to organize work, and the ability to comprehend and retain subject matter and to apply it to new problems and contexts.

**3 (Good):** This grade denotes considerable understanding of the subject matter. It represents a strong grasp and clear understanding of the subject matter and the ability to comprehend and retain course content.

**2.5 (Above Average):** This grade denotes above average understanding of the subject matter. It represents a good grasp of the subject matter and the ability to comprehend and retain course content.

**2 (Average):** This grade denotes average understanding of the subject matter. It represents the grade that may be expected of a student of normal ability who gives the work a reasonable amount of time and effort.

**1 (Below Average):** This grade denotes below average understanding of the subject matter. It represents work that falls below the acceptable standard.

**0 (Failure):** This grade denotes inadequate understanding of the subject matter. It signifies an absence of meaningful engagement with the subject matter and that the student is not capable of doing or understanding the work or has made little or no effort to do so.

**W (Withdrawal):** Students are permitted to withdraw from courses without penalty up to the ninth Friday of the fall or spring semester. Corresponding deadlines are set for all other semesters (e.g., summer sessions). Withdrawal after that time shall result in a grade of “0.”

**I (Incomplete):** The student may request permission from the instructor to receive an incomplete prior to the final examination and must present extraordinary reasons for the petition. The Instructor should indicate on the Attendance/Final Grade Record the required work the student must do to complete the course. Any grades of “I” not removed within two calendar months after the end of the semester will automatically be changed to “0” in the Records Office. Grades of incomplete should only be provided to students who have completed a substantial portion of all course requirements.
## Schedule for Class Meetings

<table>
<thead>
<tr>
<th>DATE</th>
<th>TOPIC</th>
<th>Reading Assignment (Sections of Tro)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-22</td>
<td>Introduction to Course</td>
<td></td>
</tr>
<tr>
<td>1-27</td>
<td>Energy and Heat</td>
<td>6.1 – 6.4</td>
</tr>
<tr>
<td>1-29</td>
<td>Calorimetry, Enthalpy, Hess’s Law</td>
<td>6.5 – 6.8</td>
</tr>
<tr>
<td>2-3</td>
<td>Gas Properties and Behavior</td>
<td>6.9, 5.1 – 5.3</td>
</tr>
<tr>
<td>2-5</td>
<td>Gas Mixtures</td>
<td>5.4 – 5.7</td>
</tr>
<tr>
<td>2-10</td>
<td>Real Gases, Phases of Matter</td>
<td>5.10, 11.2, 11.8</td>
</tr>
<tr>
<td>2-12</td>
<td>Intermolecular Forces of Attraction</td>
<td>11.1, 11.3, 11.4</td>
</tr>
<tr>
<td>2-17</td>
<td>Liquids, Vapor Pressure, and Phase Changes</td>
<td>11.5, 11.6, 11.7</td>
</tr>
<tr>
<td>2-19</td>
<td>Exam 1</td>
<td>Ch. 5, 6, 11</td>
</tr>
<tr>
<td>2-24</td>
<td>Reaction Rates and Rate Laws</td>
<td>13.1 – 13.3</td>
</tr>
<tr>
<td>2-26</td>
<td>Integrated Rate Laws and Practice</td>
<td>13.4</td>
</tr>
<tr>
<td>3-10</td>
<td>Reaction Mechanisms and The Arrhenius Equation</td>
<td>13.5 – 13.7</td>
</tr>
<tr>
<td>3-12</td>
<td>The Equilibrium Constant</td>
<td>14.1 – 14.5</td>
</tr>
<tr>
<td>3-17</td>
<td>Solving Equilibrium Problems</td>
<td>14.6 – 14.8</td>
</tr>
<tr>
<td>3-19</td>
<td>Equil. Problems and LeChâtelier’s Principle</td>
<td>14.8 – 14.9</td>
</tr>
<tr>
<td>3-24</td>
<td>Review for exam 2</td>
<td></td>
</tr>
<tr>
<td>3-26</td>
<td>Exam 2</td>
<td>Ch. 13, 14</td>
</tr>
<tr>
<td>3-31</td>
<td>Acids, Bases and pH</td>
<td>15.1 – 15.5</td>
</tr>
<tr>
<td>4-7</td>
<td>Acid-Base Equilibria</td>
<td>15.6 – 15.7</td>
</tr>
<tr>
<td>4-9</td>
<td>Salt Solutions</td>
<td>15.8 – 15.11</td>
</tr>
<tr>
<td>4-14</td>
<td>Buffers</td>
<td>16.1 – 16.3</td>
</tr>
<tr>
<td>4-16</td>
<td>Titration Problems</td>
<td>16.4</td>
</tr>
<tr>
<td>4-21</td>
<td>Solubility Product Constants</td>
<td>16.5</td>
</tr>
<tr>
<td>4-23</td>
<td>Entropy, Spontaneity, and Free Energy</td>
<td>17.1 – 17.4</td>
</tr>
<tr>
<td>4-28</td>
<td>Free Energy and Equilibrium</td>
<td>17.5 – 17.9</td>
</tr>
<tr>
<td>4-30</td>
<td>Practice and Review</td>
<td></td>
</tr>
<tr>
<td>5-5</td>
<td>Exam 3</td>
<td>Ch. 15, 16, 17</td>
</tr>
<tr>
<td>5-7</td>
<td>Comprehensive Review of Semester</td>
<td></td>
</tr>
<tr>
<td>Tuesday May 12</td>
<td>COMPREHENSIVE FINAL EXAM</td>
<td>10:15am</td>
</tr>
</tbody>
</table>
Homework and Practice Problems:

Each chapter of material covered in this course has a large number of problems for practice at the end of the chapter. The problems listed here represent an average sampling from each chapter, and I strongly recommend you work on at least some of these each day after class. Many of these problems are included as part of the assignments you will complete, for credit, using Mastering Chemistry – however, when you see them online, many will likely have different numbers in them as part of a randomization that the program introduces. Completing the problems listed below prior to attempting your online, for-credit homework, should improve your proficiency and speed with which you complete the online homework. Also, note that your text pairs problems, so that in most cases each even-numbered problem is preceded or followed by a similar problem whose solution is available in an appendix at the back of the text. Thus, if you want extra practice or are unsure how to complete a problem, you might try its odd-numbered (or even-numbered, as appropriate) partner, as well. Finally, a complete solution guide is available in my office if you would like to see a detailed solution to any problem in the text.

Problems that are **bolded** in the list below are included in the required, graded homework assignments. The dates/times indicated in parentheses are the due dates of each chapter’s graded assignment in Mastering Chemistry.

Introduction to Mastering Chemistry – several exercises to familiarize you with the system  
(Due 2/5/2014 by 6 pm)

Chapter 6:  34, 39, 40, 47, **48, 49**, 57, 58, **59, 60**, 61, 63, **64, 65, 66**, 75, 77, 78, 79, 80, 81, 83, 85, **86, 87**, 93, 94  
(Due 2/5/2014 by 6 pm)

Chapter 5:  **25, 29, 31, 32, 33, 34, 35, 36, 37, 39, 40, 42, 43, 45, 55, 56, 57, 58, 62, 63, 65, 66, 67, 72, 73, 75, 76, 81**  
(Due 2/12/2014 by 6 pm)

Chapter 11:  **49, 50, 53, 55, 56, 57, 58, 59, 61, 63, 67, 68, 71, 72, 73, 78, 79, 82, 83, 85, 86, 97, 105, 107, 109**  
(Due 2/19/2014 by 6 pm)  
[Chapter11 homework helper](#)

Chapter 13:  27, (29/30), 35, 36, 37, **38, 39, 41, 42, 43, 44, 47, 51, 52, 53, 56, 59, 67, 75, 76, 91, 93, 101, 102**  
(Due 3/12/2014 by 6 pm)

Chapter 14:  **21, 22, 25, 27, 31, 32, 33, 36, 37, 38, 39, 41, 42, 43, 44, 47, 53, 54, 58, 59, 60, 63, 65, 66, 67, 69, 70, 71**  
(Due 3/26/2014 by 6 pm)

Chapter 15:  **35, 36, 37, 38, 41, 42, 45, 46, 47, 48, 49, 51, 59, 63, 64, 69, 70, 71, 72, 75, 76, 83, 87, 89, 91, 94, 99, 101, 102, 103, 105, 106**  
(Due 4/14/2014 by 6 pm)

Chapter 16:  27, 30, 31, 37, **38, 39, 40, 41, 42, 43, 45, 46, 47, 49, 50, 53, 55, 57, 58, 61, 62, 67, 77, 82, 85, 87, 88, 89, 90, 93, 95, 96, 99, 100**  
(Due 4/23/2014 by 6 pm)

Chapter 17:  27, **28, 29, 31, 32, 35, 39, 40, 41, 42, 43, 47, 48, 49, 51, 56, 57, 61, 62, 69, 70, 72, 73, 77**  
(Due 5/5/2014 by 6 pm)
Mastering Chemistry – Getting Started

If you have already registered for mastering chemistry in Gen Chem I and your account is still active, you only need to add the Course ID **MCFORESMAN136S2015** to your list of courses and you are ready to go. Ignore the rest of this page.

If you do not have an account, you begin the process by going to the Mastering Chemistry website. Registration grants you access for a period of time that will be long enough to ensure you complete both Gen Chem I and II (if you take it here at YCP). If you do not already have an access code (included with the textbook), you will purchase it online – at that time you will also become registered as part of their purchase process.

To register for student access to Mastering:

1. Go to the Mastering website: [http://www.masteringchemistry.com](http://www.masteringchemistry.com)
2. Click Students under Register.
3. Click Yes if you have a student access code. (Don't have an access code? You can purchase access online. See ‘Registering and Purchasing Access together’ below).
4. After you accept the license agreement and privacy policy, follow the on-screen instructions to complete your registration. You will be asked to provide some basic information, including a login name and password, your access code, your school (if you are asked for a Zip Code, use 17405), and an email address. You will later use this login name and password to log in to Mastering.

   The Course ID for your course is **MCFORESMAN136S2015**. You will need to enter this in order to be placed into the correct section.

5. When you complete the registration process a confirmation email containing your login name and password will be sent to the email address you provided during registration.

If you encounter any issues registering for Mastering, try contacting Customer Support.

Registering and Purchasing Access together:

Once you indicate that you need to purchase a code, notice that a group of text book cover images has appeared. You must browse the group and select our text – “Tro: Chemistry, A Molecular Approach, 3/e.” After selecting it, you will be prompted to purchase the e-text, if you would like. This is entirely voluntary – only select this option if you want access to your text electronically (and are willing to pay a bit more for it). The current cost of Mastering Chemistry, alone, is $66, while coupled with the e-text it is $110.

Next you will be asked to set-up your Pearson account. Return to the instructions above and proceed from step 4, essentially.
How to Treat a CTL Tutor

Students who go to the CTL for tutoring should:

- Attempt to complete assignments so they can ask specific questions when meeting with a tutor.
- Do their own homework. A CTL tutor will not do it for them.
- Ask for assistance in a timely manner.
- Be aware of CTL drop-in hours and plan ahead to meet with a tutor.
- Send an email request for an appointment far enough in advance so it gives the tutor time to respond and plan.
- Bring all materials they need to their tutoring session.
- Actively participate in the session. The tutor is not omniscient.
- Respect limits on tutor availability. Tutors are busy people too!
- Attend class and don’t expect the tutor to teach them what they missed.
- Put cell phones and other distractions out of sight.
- Respect other students who are also there to meet with the tutor.
- Expect confidentiality.
- Check the CTL Tutor Booking System online to see tutor availability.
- Thank the tutor when the tutoring session is finished. 😊