Welcome to Chemistry 160, the second semester of General Chemistry for Engineers. This handout provides information concerning course policies and procedures. You are responsible for all the information in this handout. A syllabus may be attached or provided separately. The material for this course is copyrighted and may not be posted on any other website at or outside of Rutgers without permission. Any violation of this policy will be treated as an academic integrity violation and will be referred to the Office of Student Conduct or equivalent for action.

**LEARNING GOALS FOR STUDENTS**

1. **Understand and Apply Basic Principles and Concepts in Chemistry as Applied to Engineering Topics Specifically**:  
   - Phase Diagrams and Crystal Structures  
   - Properties of Solutions  
   - Kinetics  
   - Equilibria  
   - Thermodynamics  
   - Electrochemistry  
   - Nuclear Chemistry

2. **Explain and be Able to Assess the Relationship Among Assumptions, Method, Evidence, Arguments, and Theory in the Analysis of Chemistry and Chemical Systems as demonstrated by the following**:  
   - Development of the Ability to Relate the Concepts Learned in the First Goal to Each Other in Ways that Were Not Directly Explained in Class  
   - Application of the Concepts Learned in the First Goal to Conceptual and Computational Problems Relevant to General Chemistry  
   - Interpretation of Graphical and Tabular Data  
   - Expression of Physical, Chemical or Engineering Processes in a Mathematical Form  
   - Solving Equations to Determine the Value of Physical, Chemical, and Engineering Variables  
   - Development of Critical Thinking Skills for the Application of Knowledge to Engineering Processes  
   - Understanding of the Basics of the Scientific Method by Applying a Relevant Body of Knowledge to the Evaluation of Existing Scientific Studies and the Design of Studies to Test Specific Hypotheses

**Assessment of Students**

An integrated approach to assessing the achievement of the learning goals 1 and 2 will be used. This includes the use of a mixture of participation in lecture and optional recitations and, a multiple choice exam questions, among others aimed specifically at each of these learning goals.

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1. Core Curriculum Goal e  
2. Core Curriculum Goal f
LECTURERS, COORDINATOR/ADMINISTRATOR

Lecturers: Dr. Setareh Marvasti (first half of the semester)
E mail: marvastis@aol.com

Dr. Emmanuel Hove (second half of the semester)
E mail: ehove12@chem.rutgers.edu

Course Coordinator/Administrator: Dr. Setareh Marvasti
E mail: marvastis@aol.com

Optional Recitation: Dr. Ramesh Agarwal
E mail: agarwal@rci.rutgers.edu

OFFICE HOURS/PROBLEM SESSIONS: Will be posted on Sakai. You are welcome to attend any or all of the office hours/problem sessions that fit your schedule regardless of instructor.

REQUIRED MATERIALS (same as used in Chemistry 159 last semester)

Please note we are not using online homework or Connect+. You do not need to purchase the interactive component Connect+.


2. "Student Solutions Manual", by Patricia Amateis and Martin S. Silberberg, for use with the above textbook. This manual contains detailed solutions to all Follow-Up Problems and to End-of-Chapter Problems with colored (blue) numbers. (Short answers to these same problems are given in the textbook.)

3. Scientific calculator (logarithms, exponentials, powers, roots, etc.). This does not have to be an expensive calculator. Expensive, programmable calculators (graphing calculators) are not allowed in this course and are considered a violation of academic integrity if used.

The books are available online. Note we are using the SECOND EDITION. Also:

Items 1, and 2 above are available as a special package (Edition 2ND 12, Publisher: MCG CUSTOM, ISBN: 9780077684419) at the main Rutgers University Bookstore in Ferren Mall, at the Livingston and Douglass Bookstores, and at New Jersey Books. The same books were used in the 2012-2013 academic year. Bookstores also sell scientific calculators.

LABORATORY REQUIREMENT

Introduction to Experimentation (01:160:171) is a one-semester, one-credit laboratory requirement. It may be taken in either the fall or the spring semester (or in the summer). Chem. 171 is a prerequisite or a co-requisite for Chem. 160, the second semester of General Chemistry for Engineers. Chem. 171 begins with the first day of classes, and the first meeting is more than a check-in period. If
you are taking Chem. 171 this semester but your registration or section assignment is not yet official, be sure to attend any laboratory section during the first week of classes. Note that some sections may be full. Chem. 159 or equivalent is a prerequisite or a co-requisite for Chem. 171.

**PREREQUISITES** (Prerequisistes for 01:160:160 - Spring 2015)

- (01:160:159 and 01:640:112)
- OR
- (01:160:159 and 01:640:115)
- OR
- (01:160:159 and 01:640:151)
- OR
- (01:160:159 and 01:640:152)

**ALTERNATIVE COURSES**

Course coordinators, deans and college advisors will be glad to assist you in making decisions on alternative courses.

1. Chem. 161-162 is the “non-engineers” version of Chem. 159-160, but is acceptable and suitable for engineers. A different textbook may be used, and each semester of Chem. 161-162 is a four-credit course: more contact time is scheduled. Chem. 161-162 is also offered in the spring, summer, and fall semesters. Engineering programs will accept Chem. 161-162.

   Chem. 159, 161, 163, or equivalent is a prerequisite for Chem. 162.

2. The chemistry department offers also a special version of Chem. 161-162 (not Chem. 159-160) in the fall and spring semesters, respectively. This version is called Solid Gems and covers the same material as regular Chem. 161-162 but has more lecture time than regular Chem. 161-162, two recitations per week, more quizzes, more exams, and smaller classes.

3. If you are interested in taking a more advanced course in place of Chem. 159-160, you should consider “Honors General Chemistry”, Chemistry 163-164. Chem. 163 is offered only in the fall, and Chem. 164 is offered only in the spring. High school chemistry is a prerequisite, and Calculus I and II are co-requisites for Chem. 163 and Chem. 164, respectively. Chem. 159, 161, 163, or equivalent is a prerequisite for Chem. 164. Switching into Chem. 164 should be done as soon as possible. For further information, you can go to the Chemistry Department home page [http://chem.rutgers.edu/](http://chem.rutgers.edu/) and click on “Undergrad” and then on “Spring Courses” and then on “Chem 164”.

**CLASSROOM MANAGEMENT SYSTEM (SAKAI)**

We will be using sakai (URL: [https://sakai.rutgers.edu/portal](https://sakai.rutgers.edu/portal)) as a classroom management system. You should check this site regularly. If you check it now, you may find a number of documents posted. If you are registered and a Rutgers Student, you will automatically be a “member” of the online class. You will need your NetID to login. You should read the documents, especially the Syllabus, The General Information, Grading Policies, the Announcements and other material very carefully. During the course additional documents will be posted on the web site including practice exams, and useful information or explanations about important topics. There is a discussion board and a chat room. This is where scores will be posted.

If you are having trouble accessing Sakai, see me after class.
You should check Sakai and attend lectures both. Any changes from the syllabus and the course will be announced in lecture.

**LECTURES**

You are scheduled for two lectures per week, each 80 minutes in length, (longer than the 55 min in Chem 159) in the Allison Road Classroom Building (ARC) Room 103, the Auditorium, depending on your section:

Sec 01 (Morning Section)
Tuesdays 10:20 AM - 11:40 AM
Thursdays 8:40 AM - 10:00 AM

Sec 12 (Afternoon Section)
Tuesdays 3:20 PM - 4:40 PM
Thursdays 3:20 PM - 4:40 PM

We have optional problem sessions in Chem 160.

**Optional Problem Sessions Schedule:** (Please commit to attending one of the problem sessions; you will receive 10 bonus points for participation for the entire semester)

Sec 01 Tuesdays 9:00 to 9:55 AM (Location to be announced)
Sec 02 Tuesdays 12:00 to 12:55 PM (Location to be announced)
Sec 03 Tuesdays 2:00 to 2:55 PM (Location to be announced)

In addition to the above, in conjunction with the Learning Centers, we will be able to hold four eighty minute sessions per week.

Note for any given week, the morning and afternoon lectures are equivalent. Attendance is of utmost importance since the lecturers will be emphasizing and clarifying important and difficult concepts. You are responsible for what transpires in lecture, including any announcements, and changes to the syllabus and for picking up a copy of all lecture handouts. Lecture handouts will not necessarily be posted on Sakai. You are also responsible for all the assigned readings and problems, whether or not they are explicitly discussed in class. The material must be read **before** as well as after any given lecture. During lecture, the lecturers will also attempt to solve problems and provide guidance with homework problems. Seriously attempt all of the assigned homework problems before lecture. Be prepared, and do not hesitate, to ask questions in order to use lecture time effectively.

Periodically you may have unannounced lecture quizzes/activities/pop quizzes. Please attend all lectures. There will be no make-up lecture quizzes/activities.

You are responsible to take notes in lecture and write down all announcements. Not everything is posted online.
EXAMS (Scientific Calculators Only)

There will be two 80-minute exams plus a 180-minute final exam:

You must take the exam at your assigned location. Locations of all exams are posted on the syllabus. Any changes for locations for all exams will be announced in your lecture. All exams will be multiple choice. Physical constants, some formulas, and a periodic table with the names of elements will be provided.

EXAM RULES AND REQUEST FOR CONFLICT EXAM (Provide documentation by the end of the second week of the course)

1. For all examinations, be at your assigned location 15 minutes before the starting time. Bring #2 pencils, erasers, and a scientific calculator with spare batteries or an extra scientific calculator and official Rutgers photo ID. Calculators may not be shared, and covers must be removed from all calculators. Earphones may not be used, and hats should not be worn.

2. The use of cell phones, PDA’s, pagers, and other electronic devices is forbidden, even for use as a calculator or a watch. You should not bring books, notes, backpacks, cell phones, electronic devices or any other unnecessary items into the exam room. If you do, they must be placed out of sight during the exam: possibly under your exam desk or at the front, back, or sides of the exam room. We are not responsible for lost or stolen items. When you leave the room, check that you have not forgotten anything, such as a photo ID card, textbook, or notebook.

3. You may NOT use scratch paper; all work will be done in the question booklet. There is plenty of room, especially if you use both sides of the paper.

4. Please fill out the entire Op-scan form carefully. Be absolutely certain that you code your student identification number correctly on the form. You may lose points if the form is not properly filled.

5. All answers must be transferred to the Op-scan form before time is called. Failing to do so may result in the loss of many points.

NOTE: If you record your answers in the exam booklet during the exam, then you will be able to find out how many wrong answers you have as soon as the answers are made available. When the computer grading is finally done, you are responsible for finding any errors in your grade and must contact your lecturer/coordinator within two weeks.

Exams take precedence over most university events; however, situations that may constitute an official exam conflict follow: 1. The student is registered for another course that meets at the same time as the scheduled exam. 2. Another exam is scheduled for the student at the same time. 3. Athletic practice is required by a coach. 4. Religious observance. 5. Verifiable medical reasons.

Note that you will not usually be excused from a class or a lab because you have an exam scheduled when that class or lab meets. If you have a class that precludes you from starting a common hour exam on time, you need to apply for a conflict exam.

If you think that you have a conflict with the FINAL EXAM, be sure to read carefully about this matter in the schedule of classes. A student shall be said to have an exam conflict if that student has:
• More than two (2) exams on one calendar day.

• More than two (2) exams scheduled in consecutive periods (e.g., a student has exams scheduled for 4:00 – 7:00 PM and 8:00 – 11:00 PM on one day and 8:00 – 11:00 AM on the following day.)

• Two exams scheduled for the same exam period.

To request permission to take any conflict exam, please contact the course coordinator/administrator within two weeks of the start of the classes. Be sure to include the following documentation: 1. A copy of your course schedule as sent to you by the university. 2. Supporting documents to verify that a conflict exists: a note signed by a course professor or by a coach; for religious observances, attach a note verified by your Dean.

A list of students approved for each conflict exam may be posted on the web site prior to each exam; or students may be notified individually by e-mail or in person. A conflict exam may be given in the same evening as a regularly scheduled common hour exam at a time and location to be announced. The date, time, and location of the conflict/make-up final exam will be announced.

If you miss an exam for unforeseen and verifiable medical reasons, you must notify the course coordinator/administrator (by e-mail) immediately with an explanation. Later, you must provide the coordinator/administrator with supporting documents. There are no make-up exams for the common hour exams. For students who are excused from an exam, the total points will be adjusted to account for the missing exam.

**GRADING**

The course grade (A, B+, B, C+, C, D, F) will be based on the total number of points that a student accumulates. The maximum score is roughly expected to be 400 points distributed as follows:

<table>
<thead>
<tr>
<th>Points</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>Exam 1</td>
<td>100</td>
</tr>
<tr>
<td>Exam 2</td>
<td>100</td>
</tr>
<tr>
<td>Final Exam</td>
<td>200</td>
</tr>
<tr>
<td>Attendance/Evaluation/Other Activities</td>
<td>May make a difference for borderline cases</td>
</tr>
<tr>
<td>Participation in Optional Problem Sessions</td>
<td>10 bonus Points</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>400</strong></td>
</tr>
</tbody>
</table>

The final grade will be based on the total number of points accumulated compared to the total accumulated by the rest of the class and your performance on the final exam. There is no “preset” number of points needed to obtain an “A,” “B,” or “C.” The conversion between point total and letter grade is not yet...
established and will be determined at the end of the semester. **Any student who fails the final exam may fail the course regardless of the total number of points.**

There is no minimum passing score on the final exam, however anyone who scores low on the final may end up with a grade lower than his or her points might otherwise have earned. For example, a student in the C+ point range and low on the final might be given a grade of C or D (or lower). Further, we might assign a failing grade to anyone who scores very low on the final, regardless of the grade indicated by the points, depending on the circumstances. The exams are not curved individually. At the end of the semester, a grade will be assigned based on the total score. However, a tentative and rough letter grade solely based on the exam may be given during the semester as a very rough guide as how you performed on that exam. The final letter grade for this course will not be based on the rough and tentative letter grades for the individual exams.

If you find yourself doing poorly, come see the instructional staff and read the sections on obtaining help. At the end, we can only grade you on the basis of your performance in the course, which includes the evaluations in class (examinations, etc. and our subjective opinion of what you have learned). **There is no extra credit in this class.** It is unfair to the rest of the students. Based on experience from previous years, please do not ask if you can do extra work to improve your grade. You are graded on your **performance** in the course. For obvious reasons, you will not be graded on how hard you worked, or other factors such as personal reasons, financial issues, losing a scholarship, inability to apply for a specific program, not making the Dean’s list, non-payment for your course, being a senior, being offered a job, your family situations, the impact on your GPA, a course requirement, transfer of the course to another school, your work requirements, the potential of you getting suspended etc… For the same reasons that we cannot arbitrarily give you a better grade, we cannot do the reverse, we cannot change a D to an F.

We will not disclose what the final point ranges are. We make every effort to include non-point related evaluations to adjust the grades to accurately reflect the level of learning you have demonstrated. Thus, two students with identical numbers of points may receive different grades, if that is warranted based on overall performance and improvement throughout the semester.

We will not discuss the grades and performance of other students with you.

**STUDENTS WITH DISABILITIES**

If you have a disability, you must contact the course coordinator/administrator by the end of the second week of the start of the semester to make the necessary arrangements to support a successful learning experience and to schedule exams. Do **NOT** request the Office of Disability Services to schedule exams. Also, you must arrange for the course coordinator/administrator to receive a letter from your College’s Disability Concerns Coordinator verifying that you have a disability by the end of the second week of the course. Please bring two copies of the form as required by the Office of Disability Services.

<table>
<thead>
<tr>
<th>Office of Disability Services</th>
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</thead>
<tbody>
<tr>
<td>Lucy Stone Hall, Livingston Campus</td>
</tr>
<tr>
<td>54 Joyce Kilmer Ave., Suite A145</td>
</tr>
<tr>
<td>Piscataway, NJ 08854-8045</td>
</tr>
<tr>
<td>Phone: (848) 445-6800</td>
</tr>
<tr>
<td>Fax: 732.445.3388</td>
</tr>
<tr>
<td>E-mail: <a href="mailto:dsoffice@echo.rutgers.edu">dsoffice@echo.rutgers.edu</a></td>
</tr>
<tr>
<td>Website: ods.rutgers.edu</td>
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</table>
ACADEMIC INTEGRITY

All University polices on academic integrity will be strictly enforced. Any involvement with cheating, the fabrication or invention of information used in an academic exercise, or facilitating academic dishonesty of others will result in serious consequences ranging from reprimand to expulsion. Bringing information into an exam, whether stored electronically or on paper, shall be considered cheating. Having a cell phone or pager at hand during a test shall be considered prima facia evidence of cheating. All electronic devices, other than a scientific calculator must be completely turned off (Vibrate and standby modes are not accepted) and out of sight during testing. No gadgets (cell phones or other devices) are allowed with the ability to communicate with others during the exam (text or any other form). Cell phones and gadgets cannot be on carried on you or in your pockets during the exam, as such texting is not allowed during the exam. Use of a calculator with the ability to communicate with other calculators, that are programmable, that have any permanent alphanumeric memories (“graphing” calculators) is expressly forbidden. Use of such calculators may result in a score of zero on the quiz or exam during which it was discovered and the involvement of the Office of Student Conduct and appropriate personnel. Signing for another student (for example on an attendance sheet) is considered to be a violation of academic integrity. Refer to the website for academic integrity information:
http://academicintegrity.rutgers.edu/

The University’s policy on Academic integrity can be found at:

We cannot see everything that occurs in the course. If you observe any violations of the rules, you owe it to yourself and your fellow students to report it. If you do not report, you are also hurting your own grade. This will affect the overall curve. You can report it to one of the proctors/instructors during the exam if you would like to remain anonymous. We will treat these reports in the strictest confidence.

The material for this course is copyrighted and may not be used / posted on any other web site at or outside of Rutgers without permission. Any violation of this policy will be treated as an academic integrity violation and will be referred to the Office of Student Conduct or Equivalent for action.

GENERAL COMMENTS AND ADDITIONAL HELP

General Chemistry is considered by many students to be a difficult course. In order to be successful, you must be conscientious and devote considerable time to the course material. Your success will depend primarily on your ability to analyze logically the wording in the chemical problems assigned for homework and given on quizzes and exams. You must learn to relate the basic concepts to the mathematical expressions that describe them. For most students, the best way to learn the material is to work on the homework problems independently, with the solutions manual, notes, and textbook closed. You can solve extra problems if you think you need more practice. Good analytical skills and problem solving techniques must be acquired in order to pass the exams that consist primarily of word problems. Rote memorization of the book will not allow you to pass the course. Chemistry is a cumulative subject where one principle builds upon another. This course in general chemistry moves along at a fast pace and you need to stay on top of the material at all times. Experience shows that students who fall far behind encounter difficulties and rarely catch up again.

If, despite attending all lectures and recitation classes and working out all homework problems, you realize that some difficulties remain with understanding the course material, then seek help early! We encourage you to see any instructor in the course. We will be glad to assist you as long as you take the initiative. The Rutgers Learning Centers (http://rlc.rutgers.edu/) the Math and Science Learning Centers (http://mslc.rutgers.edu/index.shtml), the School of Engineering offer sources of help, sometimes including formal tutoring.
<table>
<thead>
<tr>
<th>Busch Campus Math &amp; Science Learning Center</th>
<th>Cook/Douglass Math &amp; Science Learning Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARC Building (where you have lectures), Room 332</td>
<td>Heldrich Science Building (Chemistry Building) (3rd floor)</td>
</tr>
<tr>
<td>618 Allison Road</td>
<td>50 Bishop Street, Douglass</td>
</tr>
<tr>
<td>Piscataway, NJ, 08854-8000</td>
<td>Phone: (732) 932-8991</td>
</tr>
<tr>
<td>Tel: (848) 445-3123</td>
<td>FAX: (732) 932-1241</td>
</tr>
</tbody>
</table>

**CHAIN OF COMMAND**

Questions regarding course material, exam scores, etc. should be directed to Dr. Marvasti, the course coordinator/administrator. Contact the coordinator/administrator in person (sometimes your concerns can be resolved quickly face to face) or send the coordinator/administrator an e-mail. Please do not call the chemistry department.

**HOMEWORK**

Although we do not have regularly scheduled recitations, please attend problem sessions, sessions provided by the Learning Centers and/or office hours. Perform the homework problems regularly so that you do not fall behind. You can ask your questions during problem sessions, sessions provided by the Learning Centers or office hours.

**WEATHER AND OTHER EMERGENCIES**

Check the Rutgers website for any information concerning campus operations due to weather conditions or other emergencies. The “Campus Operating Status” can be found at http://nb.rutgers.edu/about-us/new-brunswick-campus-operating-status or by going to the main New Brunswick webpage at http://nb.rutgers.edu. If classes are on schedule, then labs will be held as scheduled. If there is a delay in opening, as long as there are 2 hours remaining for the lab period, students should attend lab for the remaining time. Changes in schedule and other adjustments will be announced in the lecture. Students are still responsible for all the material from readings, homework problems and lecture even if a particular lab is cancelled due to weather emergency.

When announcements are made, campus status information will also be available through:

- Rutgers University Facebook page
- Rutgers University Twitter (@RutgersU)
- RU-info Channel on RU-tv 3
- RU-info Call Center at 732-445-INFO (4636)
- Texting us at 732-662-2664

For more information about the university's policy concerning adverse weather conditions, please visit http://emergency.rutgers.edu/weather.shtml.
Campus status information will also be available through these media stations and their websites:

- News-12 New Jersey
- New Jersey 101.5 (FM)
- WCTC Radio (1450 AM)
- WCBS Radio (880 AM)
- The Breeze Radio (107.1 and 99.7 FM)
- WRNJ Radio (1510 AM, 104.7 and 92.7 FM)
- WRSU Radio (88.7 FM)