GENERAL INFORMATION AND SYLLABUS
CHEMISTRY 111A, FALL 2014

LECTURES: Lectures for Section 1 are held in Louderman 458. Lectures for Sections 2 and 3 are held in Lab Sciences 300. Section 1 has Professor Bill Buhro as instructor at 9:00 a.m. Section 2 has Dr. Megan Daschbach as instructor at 10:00 a.m. Section 3 has Professor Rich Loomis as instructor at 11:00 a.m. All sections will cover the same material. There will be no differences in problem sets, quizzes, or exams.

INSTRUCTORS: Professor B. Buhro, Dr. M. Daschbach, Professor R. Loomis, and Dr. J. Luo

COURSE ADMINISTRATIVE ASSISTANT: Ms. Cassandra Parker (Office: McMillen Labs, Room 419) Office Hours: 2:00 pm – 4:00 pm, M-F.

TEXT: D. Oxtoby, H. Gillis, and A. Campion, Principles of Modern Chemistry (7th edition). NOTE: Problems from earlier versions of the textbook will often be numbered differently. There are two copies of the 7th edition text on reserve in the Chemistry Library.

COURSE WEB SITE: The Chem 111A Web site contains general information, announcements, reading assignments, solutions to assigned problems, quizzes, and exam problems. The Web site is found on the Blackboard Web site (https://bb.wustl.edu) and is also linked through the Chemistry Department courses Web page (http://www.chemistry.wustl.edu/courses/fall-2014/general-chemistry-i).

COURSE CALENDAR: http://www.chemistry.wustl.edu/~courses/calendars/chem111_cal.html The course calendar may also be found under the Calendar tab in Chem111A Blackboard Web site.

COURSE MESSAGES or EMAIL: Students may communicate with course instructors after class, by course e-mail (genchem@wustl.edu) or by speaking to Ms. Parker (McMillen Labs 419). Students are requested not to phone or e-mail the instructors directly.

RECITATION CLASSES: Recitation Classes (Subsections A–Z, XX, YY, and ZZ) will be held weekly on Thursdays, beginning September 4. Standard one-hour recitations are held at 9:00 a.m., noon, and 3:00 p.m. Extended and POGIL recitations are held at 8:30 a.m., 11:30 a.m., and 2:30 p.m. You must register for and attend the SAME Recitation Class the entire semester. These classes will discuss lecture material and additional illustrative problems. Eight quizzes, one per week, will be given beginning on Thursday, September 11, except for the weeks of midterm exams, fall break, and Thanksgiving. There are no make-up quizzes. A score for each student will be generated based on the student’s top seven quiz grades. In calculating the total quiz score, the lowest score will be dropped and remaining total will be used.

i-CLICKERS: This semester, all three sections of Chem 111 will be using i-Clicker technology during every class. Each student will need to check out an i-Clicker from Olin Library in order to participate. This device is free to each student registered in the course, so be prepared to present your student ID at the Olin library reference desk. Return your i-Clicker after classes end and before December 19. Students who do not return their i-Clicker at the conclusion of the semester will be charged for the replacement of the device. i-Clickers will be registered on the first day of Recitation.

CALCULATORS: For Chemistry 111A and 112A offered in the 2014-2015 academic year, only the following models of electronic calculator will be allowed during quizzes and exams:
The preferred models for ease of calculation are the following 4-line calculators:
- TI-30 XS Multiview
- TI-34 Multiview

The following 2-line calculators are also acceptable:
- TI-30Xa
- TI-30X IIs (solar)
- TI-36X

PLEASE NOTE: The TI-30XS-PRO and the TI-36X-PRO are NOT allowed.

No exceptions will be granted and this policy will be strictly enforced. These are all four- or two-line, non-programmable, non-graphing calculators. They are available from the WU bookstore, and also from (among other places) Walgreens, Comp USA, Staples, RadioShack, OfficeMax, Office Depot, and, of course, Amazon. Please note: your calculator must be approved by your TA during the first Recitation session on September 4 before you take the first quiz on September 11.

PROBLEM SETS: Problem sets will usually be assigned on Friday. All assigned problems, either from the textbook or additional non-textbook problems, will be posted under the Problem Set Assignment Folder. The solutions to all assigned problems will be found in the Problem Set Solutions Folder. Both of these folders are found in the Files Section of the Blackboard-Chem 111 course Web site. Problem sets will not be collected or graded. Solutions for the problem sets will be posted one week after each set is assigned.

ACCESS TO SUPPLEMENTARY PROBLEMS: Problems from the weekly Peer-Led Team Learning (PLTL) study-group sessions will be posted on the Monday morning following a PLTL session. PLTL Study Problems will be posted under the PLTL Problems Folder in the Files Section of the Blackboard-Chem 111 course Web site. Solutions to these problems are not posted. Questions about these problems may be asked at help sessions. Problems from the weekly POGIL recitations will be posted on the Friday morning following each Recitation session. POGIL recitation problems will be posted under the POGIL Recitation Problems Folder in the Files Section of the Blackboard-Chem 111 course Web site. Solutions to these problems are not posted. Questions about these problems may be asked at help sessions.

EXAMS: Three (3) one-and-a-half hour (1.5 hr) exams will be given on Tuesdays from 6:30 to 8:00 p.m. Exams will be given on Tuesday, September 30; Tuesday, October 28; and Tuesday, December 2. All exams are closed book and notes, and will consist of problems and questions. No electronic devices of any nature except the approved calculator are allowed. Each exam will be worth 100 points with a mean that is anticipated to be between 60 and 65 points. In the event that a mean lower than this range is obtained, the instructors reserve the right to adjust the exam scores to higher values. The grade cutoffs included in the table below can be used to provide self-evaluation for students on each exam. (Cutoffs for “plus” and “minus” letter grades will only be given for the final course letter grades, not for each exam.) Exam rooms will be announced during lecture, and will be posted under the Announcements Section of the Blackboard-Chem 111 course Web site. Graded exams will be returned under supervision on presentation of a valid student ID on the Friday following each exam in the Resource Room on the 4th floor of the Lab Sciences building from 1:30 – 3:00 p.m. Any exams not picked up during that time may be retrieved directly from Ms. Cassandra Parker in McMillen Labs Room 419 (on presentation of a valid student ID) during her office hours. There are no make-up exams.

A student’s two highest exam scores (2 out of the 3 midterm exams) will be considered in determining final point totals for the course. THERE ARE NO MAKE-UP EXAMS. If an exam is missed, this will be considered the low score to be discarded. This is to take into account possible absences due to illness or other unavoidable circumstances.
Letter Grade | Midterm Exam Points | Final Exam Points
---|---|---
A | $\geq 75$ | $\geq 97$
B | $55 - 74$ | $72 - 96$
C or lower | $< 55$ | $< 72$

**FINAL:** A 130-point cumulative final exam will be given on **Tuesday, December 16**, from **8:00 to 10:00 a.m.** The final exam is mandatory for obtaining a passing grade in the course.

**EXAM REGRADES:** To submit a regrade request, students must execute the following procedure. A properly completed **regrade request form** must be stapled to the first page of the exam listing a brief explanation of each grading error. The entire exam must be turned in. **NOTHING ON THE EXAM PAGES MAY BE CHANGED.** If additions or changes to the graded exam are made, the regrade request will be invalidated and disciplinary action will be taken (see Ethics section below). Regrade requests will be handled by the instructors. The regrade points ultimately awarded will then depend on the validity of the regrade request as determined by the instructors. Students will earn black marks for illegitimate regrade requests commensurate with the number of such requests. These black marks may be considered negatively in assigning semester grades to borderline cases. A handout entitled **Guidelines for Legitimate Chem111A Regrade Requests** will be available after the first exam to help students identify and prepare legitimate requests. This handout can be obtained under the Course Handouts Folder in the Files Section of the Blackboard-Chem111 course Web site. All students should examine the handout before submitting regrade requests.

Requests for corrections of simple clerical errors or incorrect addition of exam total scores will not be considered to be regrade requests, and such corrections will be made at any time throughout the Fall semester and winter break until **January 16, 2015**, with no risk of earning black marks.

Regrade requests must be turned in by **4:30 p.m.** on the **Wednesday** after the midterm exam is returned to you. Return the regrade request to the wooden cabinet, labeled "Chem 111/112 Regrade Requests," on the 2nd floor of Lab Sciences. Regrade requests for the final exam must be turned in by **4:30 p.m.** on **Friday, January 16, 2015**.

**Please note:** absolutely no regrade requests will be considered after the regrade deadlines listed here.

To ensure fair and equal treatment of all students, changes in exam scores will be made only through this formal, written regrade mechanism. The instructors will not discuss or make changes to exam scores in face-to-face meetings with students. Once an instructor has regraded an exam, that score is final.

**STUDENT SCORES:** Quiz and Exam scores can be checked through the **Tools** Section under **My Grades** on the Blackboard-Chem111 course Web site.

**GRADES:** Each student’s point total will be the sum of the two highest 1.5-hour mid-term exam scores, the final-exam score, and the overall quiz score, which is a maximum of 70 points. Thus, there will be a maximum of 400 total points. (Students are urged to keep their quizzes and exams as a safeguard against bookkeeping errors.) Letter grades will be assigned on the basis of a direct comparison of the point totals to
the sum of the grade cutoffs. The instructors reserve the right to adjust the letter-grade cutoffs to lower total-point values, but cutoff point values will not be raised. For students opting to take the course Credit/No Credit, a Credit will require a letter-grade equivalent of a C– or above.

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Total Points</th>
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<tbody>
<tr>
<td>A</td>
<td>≥ 300</td>
</tr>
<tr>
<td>B</td>
<td>221 – 299</td>
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<tr>
<td>C or lower</td>
<td>&lt; 221</td>
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GUIDELINES AND EXPECTATIONS FOR ANSWERING QUESTIONS ON QUIZZES AND EXAMS: One of the goals of this introductory science course is to train students to think, conclude, and communicate like scientists. Good communication in science occurs through (among others) graphs, plots, schematics, and written word. As the semester in General Chemistry progresses, the instructors will be more and more critical of how students communicate via responses on quizzes and exams. Graphs and plots need to be neat, accurate, and clearly labeled. Schematics (and pictures) need to be neat and clearly communicate the phenomena they are intended to represent. Written communication (i.e. justifications) needs to be well-written (in complete sentences), fully introduce an idea or concept, develop that idea or concept, and clearly lead to a well-defined conclusion.

GENERAL HELP SESSIONS: These sessions provide opportunities for students to interact with the instructors in an informal setting and work problems. Many students find these to be extremely helpful when preparing for weekly quizzes or exams. The instructors recommend that students participate in one help session per week. General Help Sessions are open to all students in Chem 111A and will be held beginning Friday, September 5. Students may attend any help session regardless of the section in which they are registered.

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<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Room</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>3:00 pm – 4:30 pm</td>
<td>Seigle L004</td>
<td>Luo</td>
</tr>
<tr>
<td>Tuesday</td>
<td>4:00 pm – 5:30 pm</td>
<td>Louderman 461</td>
<td>Daschbach</td>
</tr>
<tr>
<td>Wednesday</td>
<td>3:00 pm – 5:30 pm</td>
<td>Louderman 458</td>
<td>Loomis</td>
</tr>
<tr>
<td>Friday</td>
<td>3:00 pm – 4:30 pm</td>
<td>Louderman 461</td>
<td>Buhro</td>
</tr>
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LECTURE VIDEOS: Video of all lectures will be posted in the Blackboard pages for this course. To access the videos, click on ‘Lecture Videos’ in the Blackboard course menu. Under this tab, the uploaded taped lectures will be organized by section/instructor. Click on the lecture section you wish to view and then find the video you would like to watch (videos are organized by date). To view the video in "full screen" mode, click the blue link below the thumbnail. The video will open in a new tab of your browser. Videos will appear on Blackboard within 24 hours of their recording. If you have problems accessing the videos, please contact Student Technology Services by submitting a trouble ticket at sts.wustl.edu, or stopping by the STS Help Desk in Gregg Hall on the South 40. Please remember that the availability of the videos is dependent on the availability of Blackboard. Blackboard is unavailable every Friday from 3:00 a.m. to 5:00 a.m. for scheduled maintenance.

LECTURE NOTES: TAs will take lecture notes. Students may also request a copy of these notes via email to the course email at genchem@wustl.edu (please note: the email must be sent from your @wustl.edu account and must include your full name and student ID number).
PLTL STUDY GROUPS: There are optional PLTL study groups that meet once a week on Saturday or Sunday for a two-hour workshop. Each study group works together on prepared problems that are designed to be solved cooperatively, with a PLTL undergraduate leader facilitating the group. The groups utilize collaborative-learning strategies in their sessions. The leader does not help solve the problems, but guides and facilitates the group.

Online sign-up for PLTL begins at 5:00 p.m. on Monday, August 25. The link to the online application may be found after 5:00 pm on August 25 under the Links Section of the Blackboard-Chem 111 course Web site.

The deadline for signing up is Midnight on Friday, August 29. First-year students must have taken the online diagnostic exam by Midnight on Sunday, August 31 to be placed in a group. Please note: you may register for PLTL before completing the online diagnostic exam as long as the deadline is met. Group information will be sent to your Washington University e-mail address by Friday, September 5. The first PLTL sessions will be on Saturday, September 6 or Sunday, September 7. Please note: the online application for PLTL includes an attendance policy. If you sign-up for a PLTL group, you must attend all PLTL sessions.

ACADEMIC MENTORS: Academic mentors are available for group workshops. Students should go to Cornerstone: Center for Advanced Learning (located in Gregg Hall on the South 40) to join a group. Additional information can be obtained from the Cornerstone Web site (http://cornerstone.wustl.edu).

RESIDENTIAL PEER MENTORS: Residential Peer Mentors (RPMs) are trained upperclassmen who received at least an A in the course for which they provide mentoring. Each freshmen residential college has a dedicated Chemistry RPM living in residence with scheduled office hours. No appointment is necessary.

DISABILITY SERVICES: Students who are seeking disability information or support for a disability should contact Disability Resources (DRC) at 935-5970. Disability Resources is located at Cornerstone in Gregg Hall on the South 40. Disability Resources is responsible for approving and arranging all accommodations for University students.

ETHICS: Evidence of an academic integrity violation or attempted academic integrity violation will be forwarded to the Committee for Student Academic Integrity, and we will follow the committee’s recommendations. Please refer to the Statement of Student Academic Integrity” on the Washington University Web site at:

https://acadinfo.wustl.edu/WUCRSLFrontMatter/WebWUCRSLInfo_AcadIntegrity.htm.

Please note: all graded quizzes and exams are scanned and filed prior to returning to students.

DISCLAIMER: The instructors reserve the right to make modifications to this information throughout the semester.
1. Quantum Mechanics and Atomic Structure
   A. Structure of the Atom (Sect. 1.3 – 1.4)
   B. Waves and Light (Sect. 4.1)
   C. Bohr Atom, Photoelectric Effect, and Atomic Spectra (Sect. 4.2 – 4.4)
   D. Wave-Particle Duality (Sect. 4.4)
   E. The Schrödinger Equation and Particle-in-a-box Model (Sect. 4.5 – 4.7)
   F. Quantum Mechanics of the Hydrogen Atom (Sect. 5.1)

2. Multi-electron Atoms and Periodicity
   A. Atomic Configuration (Sect. 5.1 – 5.3)
   B. Periodic Trends including Bond Types: Ionic, Covalent, and Polar Covalent (Sect. 3.6, 3.9 and 5.5)

3. Chemical Bonding
   A. Lewis Structures (Sect. 3.10)
   B. VSEPR Model (Sect. 3.11)
   C. Hybridization (Sect. 6.9 – 6.10)
   D. Molecular Orbital Theory (Sect. 6.3 – 6.6)
   E. Combining Hybridization and Molecular Orbital Theory (Sect. 7.4)

4. Properties of Gases, Intermolecular Forces
   A. Ideal Gases (Sect. 9.1 – 9.5)
   B. Real Gases (Sect. 9.6)
   C. Intermolecular Forces and Dipole Moments (Sect. 10.2 – 10.3)