CHEMISTRY E-1ax
SYLLABUS - FALL 2015

INSTRUCTOR:
Gregg Tucci       tucci@fas.harvard.edu       Science Ctr. 114
Office Hours: At a time to be determined, and by appointment.

HEAD TEACHING FELLOW:
Justin McCarty    jmccarty@g.harvard.edu
Office Hours: At a time to be determined, and by appointment.
Contact Justin with any general administrative questions about the course.

LECTURES:
Lecture videos will be streamed live on Thursday evenings at 6 pm EST. The first lecture will be on Sept. 3rd, and Lectures will be held on each subsequent Thursday with the exception of exam weeks. After the lectures are concluded, video recordings of the lectures will be available on the course website to watch at any time. All lectures are 3 hours long.

WEBSITE:
https://canvas.harvard.edu/courses/4264

REQUIRED COURSE MATERIALS:
1. General Chemistry: The Essential Concepts, Raymond Chang
   Sold at the Harvard Coop and available through various online retailers.
   New and used books are available, and electronic versions are available for purchase or rental. We will be using the 7th edition, but any print edition or electronic version is fine.

2. Chem E-1a General Chemistry Practice Problems
   Posted as PDF files on the course website. In addition, a printed and bound version will be available for purchase at Flashprint (located at 99 Mt. Auburn St. in Harvard Square) one week before the first class.

3. Approved Calculator
   See information in this syllabus about the calculator policy. An approved calculator will be necessary for the examinations.
DISCUSSION SECTIONS:
Discussion sections are led by your Teaching Fellow (TF), and provide an opportunity for small-group instruction with a focus on practical problem solving. Discussion sections will meet online for approximately one hour each week at a time to be determined. Students unable to participate in the live streaming broadcast of the discussion section will be able to watch a recording that will be posted on the course website the following day. Discussion sections provide an invaluable resource for developing problem-solving skills that will be necessary to complete the problem sets and exams. The Teaching Fellow assigned to your discussion section will also hold online office hours at a time to be arranged or by appointment.

WEEKLY REVIEWS:
The weekly review lectures, presented by the Head TF, focus on practical applications of material taught in the previous lecture through hands-on problem solving. You will find these reviews useful in helping you prepare for the exams as well as the weekly assignments. Each review is 1.5 hours long, and videos of the reviews will be posted on the course website by Saturday afternoon each week. Problems that will be covered in the review will be posted on the website prior to each review.

ASSIGNMENTS:
Each Thursday evening we will post a new problem set assignment on the course website. You will be expected to begin work on the problem set before your discussion section, and the completed problem set will be due the following Thursday before 6pm EST. Problem sets will be submitted online through the course website. Problem sets should be completed by hand and then scanned for submission. Further details about the process for submitting problem sets will be provided during the first week of class. All problem sets must be submitted by 6 pm EST on Thursdays; late problem sets will not be accepted.

The problems in these problem sets come from many sources; some are new and original, but others come from old exams or problem sets, or other textbooks. If you should stumble on to the solution to one or more of these problems, do not copy it! That will be considered plagiarism, and can result in your dismissal from the course or from the Extension School, or both.

You may collaborate with other students on your problem sets, but the final written assignment that you submit must be all your own work. We consider acceptable collaboration on assignments to encompass discussing, planning, and thinking through the solutions to problems with your peers. However, when you are finished discussing the problems with your fellow students, you must then write up your solutions independently. When you have finished independently writing up your problem sets, you may verbally or by email discuss and check your answers with your peers, but there may be no passing of homework papers (or scans of homework papers) between collaborators. If you have discussed the problem set with any other students or collaborated with any other students in any way, you must write the names of your collaborators at the top of your completed problem set.

Although we encourage collaboration, we strongly recommend that you make a genuine effort to solve the problems by yourself, before you turn to peers, teaching fellows, or instructors for assistance. This will allow you to see where your own personal roadblocks are, and will help you to focus on them. You may also find it very helpful to complete the assigned Practice Problems for each week and watch the review lecture before completing the problem set. Working on the problem sets and problems from the Practice Problems is the single most important part of your learning and preparation for exams in this course.
**CALCULATORS:**
You will need a calculator to complete the problem sets and exams in Chemistry E-1a. However, we will only allow the use of certain calculators during examinations due to the possibility of storing notes, formulas, and other information in some programmable and graphing calculators. Most standard scientific calculators will be acceptable for this course. All programmable and graphing calculators are prohibited. See the attached handout for more specific information about approved and prohibited calculators.

**EXAMINATIONS:**
Three proctored midterm exams will be given on Thursday evenings at 6 pm for two hours on October 1, October 29, and December 3. The proctored three-hour final exam will be given on Thursday, December 17 at 6 pm. Students who live in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, or Vermont will be required to come to Harvard on these dates to take these exams. Students residing outside of the New England area will need to make arrangements to find a qualified proctor to administer the exams on these dates. Additional information about finding an exam proctor outside of New England can be found on the Extension School website.

There will be no makeup examinations. If you miss an exam for any reason, you must notify Gregg Tucci and Justin McCarty by email as soon as possible with the reason for your absence, and you must provide us with documentation that justifies your absence. If we approve the absence, we will shift you into grading “Plan B”, which effectively means that your missed midterm exam will be “made up” by the final exam score. Undocumented and unapproved absences will receive a score of zero for the missed exam, and your final grade will only be assigned based on “Plan A”. If you do not notify us by email before the missed exam or, in the case of an emergency, as soon after the missed exam as is possible, we will count the absence as an unexcused absence, and the missed exam will count as a score of zero.

**GRADING POLICY:**
We have two possible ways of calculating your grade, either giving more weight to your midterm exams or more weight to the final exam. We calculate both ways and choose the one that is in your favor:

<table>
<thead>
<tr>
<th></th>
<th>Plan A</th>
<th>Plan B</th>
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</thead>
<tbody>
<tr>
<td>Three Midterm Exams</td>
<td>45%</td>
<td>30%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30%</td>
<td>45%</td>
</tr>
<tr>
<td>Problem Sets</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
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Most students score higher on the midterm exams than on the final. Thus for most students their grade will be calculated by Plan A, and the final will count only 30%. However, students who perform poorly on the midterm exams but then show improvement on the final will be helped under Plan B by weighting the final exam at 45%.
Note:
If you miss one midterm exam because of an unavoidable absence you must provide us with official documentation that justifies such absence. Notification must include an email to Gregg Tucci and Justin McCarty prior to the missed exam or, in the case of an emergency, as soon as possible following the missed exam. If approved, we will count your other two midterm exam scores as worth 30% and your final exam as 45% as per Plan B; this effectively means that your missed midterm exam will be "made up" by the final exam score. An unapproved absence or an absence that is not accompanied by an email to Gregg Tucci and Justin McCarty will receive a score of zero for the missed exam and your final grade will be calculated using only Plan A.

This course is not graded on a curve. Your grade in this class depends only on how you do, not on how anybody else performs. We hope to encourage a spirit of cooperation rather than competition! We simply total up your grades according to the weighting schemes above, choose the higher of the two totals, and use the following scale to assign letter grades:

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
</tr>
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<tbody>
<tr>
<td>94 – 100</td>
<td>A</td>
</tr>
<tr>
<td>90 – 94</td>
<td>A–</td>
</tr>
<tr>
<td>85 – 90</td>
<td>B+</td>
</tr>
<tr>
<td>80 – 85</td>
<td>B</td>
</tr>
<tr>
<td>75 – 80</td>
<td>B–</td>
</tr>
<tr>
<td>70 – 75</td>
<td>C+</td>
</tr>
<tr>
<td>65 – 70</td>
<td>C</td>
</tr>
<tr>
<td>60 – 65</td>
<td>C–</td>
</tr>
<tr>
<td>50 – 60</td>
<td>D</td>
</tr>
<tr>
<td>below 50</td>
<td>F</td>
</tr>
</tbody>
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HOW TO SUCCEED IN CHEMISTRY:
Do as many practice problems as possible. The most successful students usually master all the problems in the Practice Problems. This is far more important than poring over the textbook trying to understand the meaning of every sentence! Use the textbook as a guide and as a reference, but the majority of your study time should be spent working on the Practice Problems and other problems (problem set problems, problems from lectures and reviews, etc.).

Our lectures will help you with a conceptual understanding of the course material, and your Teaching Fellows can assist you with some aspects of problem-solving, but most of the learning in this course will come as you work on problems on your own. That is the only way to succeed in chemistry!

BACKGROUND:
Little previous knowledge of chemistry is assumed, though obviously it is helpful. Chemistry does require considerable fluency in high school algebra, particularly with “word problems.” A “Math Review” will be posted on the course website so you can familiarize yourself with the mathematics background that is necessary for this course.

PLEASE ASK US IF YOU ARE CONFUSED ABOUT ANYTHING!
Welcome to Chem E-1ax!
Calculators in Chemistry E-1ax

You will need a calculator to complete the problem sets and exams in Chemistry E-1ax. However, we will only allow the use of certain calculators during examinations due to the possibility of storing notes, formulas, and other information in many programmable and graphing calculators.

Most standard scientific calculators will be acceptable for this course. All programmable and graphing calculators are prohibited. The following two calculators are recommended for this course if you need to purchase a new calculator, but all calculators on the list below are appropriate for this course.

**Recommended Calculators:**

- Casio fx-260 Solar
- Texas Instruments TI-36X Pro

You do not need an approved calculator until the first examination on October 1st. However, we strongly recommend that you obtain an acceptable calculator as soon as possible so that you can familiarize yourself with its operation and become comfortable using it as you work on the first problem set and practice problems.

If you already have a calculator that may be acceptable but does not appear on either of the following lists, contact the Head TF, Justin McCarty (jmccarty@g.harvard.edu), to confirm if it is acceptable.

**Approved Calculators:**

- **Texas Instruments:**
  - TI-30Xs
  - TI-30X IIB
  - TI-30X IIS
  - TI-30Xa
  - TI-34
  - TI-34 II
  - TI-36X
  - TI-36X II
  - TI-36X Pro

- **Hewlett-Packard:**
  - HP 10s
  - HP SmartCalc 300s

- **Casio:**
  - FX-115ES
  - FX-115MSPlus
  - FX-300ES
  - FX-260Solar
  - FX-300MSPlus
  - FX-250HC

- **Sharp:**
  - EL-531WBBK
  - EL-531WBBL
  - EL-520WBBK
  - EL-506WBBK
  - EL-501WBBK
  - EL-501WBBL
  - EL-W516B
  - EL-W535B

**Prohibited Calculators:**

- **Texas Instruments:**
  - TI-Nspire
  - TI-73
  - TI-82
  - TI-83
  - TI-84
  - TI-86
  - TI-89
  - Voyage 200

- **Hewlett-Packard:**
  - HP 33s
  - HP 35s
  - HP 39gs
  - HP40 gs
  - HP 48gII
  - HP 50g

- **Casio:**
  - ClassPad330
  - FX-9750GAPLUS
  - FX-9750GII
  - FX-9860GII
  - FX-9860GSlim
  - FX-9860G
  - FX-7400GPlus

**Sharp:**

- EL-9900C

**Note:** Calculators on cell phones, iPhones, Blackberries, laptops, iPads, tablet PCs, and any other types of computers or PDAs are prohibited during examinations.

(The TI BA II Plus is an acceptable calculator but it is not recommended due to its lack of certain features that will be needed in this course. You will likely find a simple scientific calculator much more useful.)