

# CHEM 023/025: OUTLINE OF GENERAL CHEMISTRY Fall 2020

**LECTURE A:** CHEM 023 & CHEM 025, M,W,F 8:30AM-9:20AM, Billings Lecture Hall

**LECTURE B:** CHEM 023 & CHEM 025, T,Th 8:30AM-9:45AM, Billings Lecture Hall

**Instructor:** Steve Flemer      **Office:** 331 Innovation      **email:** sflemer@uvm.edu

**Office Hours:**      **In-person office hours:** Mondays, 10-11AM; 213 Discovery Lab Room  
Wednesdays, 3-4PM; 213 Discovery Lab Room  
Fridays, 10-11AM; 213 Discovery Lab Room

**Teams Office Hours:** Tuesdays, 10-11AM (email me to set up appointment)  
                                 Thursdays, 10-11AM (email me to set up appointment)

**Lecture:**      The upcoming week's class material will be posted to BlackBoard every Saturday, in the form of two recorded lectures. These lectures will be used to cover new material. Included in this syllabus is a tentative schedule covering the order of the class material.

It is very important to have in-person interaction with all of you. Thus, these recorded lectures will be augmented with in-person lectures at the time/room given above. However, for purposes of social distancing we must divide up the class into sections which show up for lecture on one given day per week:

**Lecture A:**

Last Name A – F:	Mondays	8:30-9:20AM	Billings Lecture Hall
Last Name G – M:	Wednesdays	8:30-9:20AM	Billings Lecture Hall
Last Name N – Z:	Fridays	8:30-9:20AM	Billings Lecture Hall

**Lecture B:**

Last Name A – D:	Tuesdays	8:30-9:45AM	Billings Lecture Hall
Last Name E – M:	Thursdays	8:30-9:45AM	Billings Lecture Hall
Last Name N – Z:	Thursdays	6:00-7:15PM	Billings Lecture Hall

**Exams:**      Three semester exams and a final exam will be administered during the course. Semester exams are written to take two hours, but I am allowing everyone to have a four-hour time frame to take them.

Exam 1:	Thursday, Sept 24	6:00PM and 10:00PM
Exam 2:	Thursday, Oct. 22	6:00PM and 10:00PM
Exam 3:	Thursday, Nov. 19	6:00PM and 10:00PM
Final Exam:	Dates to be announced	

**Problems:** Exam questions will be modeled very closely to the type of problems you will encounter in the Practice Problems of each unit of study posted on BlackBoard. Solutions to all of these problems are included in these documents. While it is strongly suggested that you do as many problems as possible, the problems are not collected or graded.

**Weekly Blackboard Quizzes:** Each week, you will be responsible for taking a short online BlackBoard quiz covering the class material from the current week. Just click on the “Weekly Quiz” link on the left hand side of the CHEM23 BlackBoard page and follow the instructions. These quizzes are open-book, but must be completed independently. Weekly quizzes will be available to take until midnight of the Sunday prior to a new week of classes. A skipped or a missed quiz is given a zero.

**Online Lab Safety Quiz:** Prior to the lab sessions beginning, students must read through Lab Safety documentation and take a one-time online quiz before being allowed into their lab session. Just click the “Lab Safety” link on the left hand side of the CHEM23 BlackBoard page and follow the instructions. Students must score an 80 or better on the quiz to be admitted to lab. If you choose, you may take the Lab Safety quiz as many times as you want in order to maximize this score, as it will also count as your first lab quiz grade.

## **REQUIRED COURSE MATERIALS:**

**Text:** There is no textbook for the course. Each unit of study has a corresponding folder in the Course Materials section of the course’s BlackBoard site, within which are educational notes for that unit. These notes, while helpful for following along with the material, should not be thought of as comprehensive. Your own written class notes should be the basic core of your study materials.

**Scientific Calculator:** A standard scientific calculator is necessary for completing practice problems and exams.

**Lab Manual:** Available for download from the class’ BlackBoard site.

**Bound Laboratory Notebook:** Available at the UVM Bookstore. Required for recording data.

**(Note: the last two items are not required for CHEM 25 students).**

## **ACADEMIC INTEGRITY:**

Offenses against the Code of Academic Integrity (ie: Cheating) are deemed serious and insult the integrity of the entire academic community. Any suspected violations of the code are taken very seriously and will be forwarded to the Center for Student Ethics & Standards for further investigation.

## COURSE GRADE FOR CHEM 23 STUDENTS:

### 1. Points needed to obtain a specific grade

920 = A	870 = B+	790 = B-	680 = C	620 = D+	570 = D-
900 = A-	820 = B	760 = C+	650 = C-	590 = D	less than 570 = F

### 2. How to calculate your points:

a) **Class = 800pts**

$$\begin{array}{r} 3 \text{ Exams/1 quiz grade} = 4 \text{ grades} \\ 1 \text{ Final} = \underline{2 \text{ grades}} \\ \hline 6 \text{ grades} - 1 \text{ grade} = 5 \text{ grades} \times 1.6 = \text{class pts} \end{array}$$

I will drop your lowest score. If the final exam is your lowest grade it will only count once. If your quiz average is your lowest grade, this score will be your drop. The 1.6 factor is because each test was only worth 100 pts, and therefore the maximum number of points obtainable from the tests are 500. In order to raise this to 800 pts you must multiply the 500 x 1.6 = 800.

#### Example:

	Ex-1	Ex-2	Ex-3	Quiz Av.	Final x 2
Actual Scores	85	45	78	77	75 75
Scores Counted	85	75	78	77	75

$$\text{Total pts} = 390 \times 1.6 = 624 \text{ pts from class}$$

### b) **Laboratory = 200 pts**

Notebook / Prelab	30 pts
Lab reports	80 pts
Quizzes	65 pts
Technique	<u>25 pts</u>
	<b>200 pts</b>

3. Determination of grade: Add up your points from the class and lab and then use the chart at the beginning to determine your course grade.

Example:  $624 \text{ class pts} + 160 \text{ lab pts} = 784 \text{ total pts} = \text{C+}$

## COURSE GRADE FOR CHEM 25 STUDENTS:

Since there is no laboratory component to your grade, you will be graded on your exam/quiz scores exclusively. Your 5 highest scores will be multiplied by 2 (rather than 1.6).

**LABORATORY:** (Only for CHEM 023 students, not CHEM 025 students)

**Class format:** Due to social distancing constraints, you will be alternating between attending lab sessions in person and carrying out the same lab remotely (in a virtual fashion). Half the students in your lab section will attend a particular week's lab in person, while the other half will be tasked with working it virtually. The following week, all those who had attended lab in-person the previous week will carry out the next lab virtually, and vice versa. Your lab TA will email to inform you of which type of instruction (in-person or remote) you will be assigned to for the first lab.

**Time and Room:** Labs start 2 weeks after classes begin (week of 9/14). See your class course schedule as to your specific lab section's date/time.

**Attendance:** Students must attend the in-person lab section they are assigned to. If a medical or UVM-related conflict arises, please contact me and your lab TA to get permission to carry out the lab remotely that week.

**Safety Eyewear:** For carrying out the lab in-person, OSHA-approved safety glasses or goggles (available from the first floor stockroom or at the UVM Bookstore) must be worn by everyone once any experimentation has started in any area of a lab room.

**LABORATORY SCHEDULE**

<b><u>Date</u></b>	<b><u>Experiment Description</u></b>
31 AUG – 2 SEPT	<b>NO LABS</b>
7 – 9 SEPT	<b>NO LABS</b>
14 – 16 SEPT	Densities of Common Substances
21 – 23 SEPT	Determination of Heat Capacity Using Calorimetry
28 – 30 SEPT	Qualitative Analysis
5 - 7 OCT	Synthesis of Ionic Compound Alum from Aluminum Metal
12 - 14 OCT	Determination of a Compound's Empirical Formula
19 - 21 OCT	Reaction Stoichiometry & Equation Balancing
26 – 28 OCT	Determination of Limiting Reactant
2 - 4 NOV	Determination of Acid Content in Pickle Juice using Titration
9 - 11 NOV	Determination of Limestone Content in Soil using the Ideal Gas Law
16 – 18 NOV	Acid-Base Equilibria and Buffers

## TENTATIVE LECTURE SCHEDULE

<b>UNIT 1</b>	(Measurement & Problem Solving)	8/31 – 9/7
<b>UNIT 2</b>	(Matter & Energy)	9/7 – 9/11
<b>UNIT 3</b>	(Atoms & Elements)	9/14 – 9/18

### **Exam 1 (Thursday, Sept. 24; 6:00-10:00PM)**

<b>UNIT 4</b>	(Electrons in Atoms)	9/21 – 9/25
<b>UNIT 5</b>	(Chemical Bonding)	9/28 – 10/6
<b>UNIT 6</b>	(Molecules & Compounds)	10/6 – 10/12
<b>UNIT 7</b>	(Chemical Composition)	10/12 – 10/15

### **Exam 2 (Thursday, Oct 22; 6:00-10:00PM)**

<b>UNIT 8</b>	(Chemical Reactions)	10/15 – 10/19
<b>UNIT 9</b>	(Quantities in Chemical Reactions)	10/19 – 10/23
<b>UNIT 10</b>	(Solutions)	10/26 – 10/30
<b>UNIT 11</b>	(Gases)	11/2 – 11/9
<b>UNIT 12</b>	(Liquids, Solids, & Intermolecular Forces)	11/10 – 11/17

### **Exam 3 (Thursday, Nov 19; 6:00-10:00PM)**

<b>UNIT 13</b>	(Acids & Bases)	11/19 – 11/24
<b>UNIT 14</b>	(Chemical Equilibrium)	11/26 – 12/1

### **Final Exam (Cumulative)**