

## CHEMISTRY 105: General Chemistry II (Winter 2023)

**Instructor:** Prof. Allan East (RI-312, [allan.east@uregina.ca](mailto:allan.east@uregina.ca), office phone 585-4003).  
Office drop-in hour 13h30-14h30 MTWF, in office RI-312 (up the elevator, left, left, down the hall).

We use URCourses for posting information: <http://urcourses.uregina.ca>.

**Textbook and assignments:** TopHat website ([subscription needed](#)). This is a mandatory subscription you will need to pay for, as in Chem104 last semester: for an online textbook + lecture slides with in-class polling + assignment/test generation/collection engine.

**Laboratory:** Lab room: LB 321. Labs start Jan. 9 and go every OTHER week (no recitation work). There are several instructors; the lead is Dr. Andrew Chan ([Andrew.chan@uregina.ca](mailto:Andrew.chan@uregina.ca), LB-321.2, office phone 585-4276). The Chem 105 labs have their own URCourses website – please check it for the schedule and for what you need to prepare before each lab (yes be prepared!).

### Course Syllabus:

#### **Module 10: Gases (2 lectures)**

Properties of gases, ideal gas law, gas mixtures.

#### **Module 13: Chemical Kinetics (5 lectures)**

Elementary rate laws, temperature effects (Arrhenius), multistep mechanisms, catalysis.

#### **Module 14: Chemical Equilibrium (3 lectures)**

Equilibrium constants and applications, Le Châtelier's principle.

#### **Module 15: Acid-Base Equilibrium (5 lectures)**

Brønsted-Lowry acids and bases, pH, strong and weak acids and bases, Lewis acids and bases.

#### **Module 16: Applications of Aqueous Equilibria (5 lectures)**

Common ion effect, buffers, acid-base titrations, solubility and precipitation.

#### **Module 17: Chemical Thermodynamics (4 lectures)**

Entropy  $S$  and Gibbs free energy  $G$ , and applications.

#### **Module 18: Electrochemistry (4 lectures)**

Oxidation states, redox reactions, electrochemical cells and cell potentials, batteries and fuel cells.

#### **Module 11: Liquids and Solids (5 lectures)**

Phase diagrams, phase changes, solid structures and bonding, polymers and plastics.

#### **Module 19: Nuclear Chemistry (3 lectures)**

Radioactivity, transmutations, half-lives, fission and fusion reactions, uses, radon.

### Grading Scheme:

Homework assignments	10%
Laboratory	20%
Midterm examination (Wednesday Feb. 15, 12h30-13h20)	10%
Final examination ( <b>Wednesday</b> April 26, 09h00-12h00)	60%

**To receive a passing grade, you must:**

**(i) achieve an overall grade > 49%, AND**

**(ii) achieve > 49% on the laboratory portion, AND**

**(iii) achieve > 49% on the final examination.**

**Otherwise, a maximum overall grade of 45% is issued.**

### **Examinations:**

You will be evaluated for the lecture section of the course by a 50-minute midterm exam (in the lecture hall) and a 3-hour final exam (in the gym). The examinations will consist of multiple choice and short answers. If you have to miss the midterm examination due to illness or family emergency, you should immediately inform your instructor. A dated, signed medical certificate or, for family emergency, other supporting documentation must be provided. Arrangements will be made on case-by-case basis. However, final examination will not be given at any other time.

### **Academic Misconduct:**

All forms of academic misconduct, including cheating, copying, falsifying lab results, misrepresentation, plagiarism, and others, are considered serious offences within the University community. Degrees are not for cheaters. All suspected cheating on material submitted for grading now has to be reported to the Associate Dean Academic of Science, because penalties now get tougher if you have a past record of cheating in other courses! First-time offences are rumoured not to be terribly brutal – maybe a zero on the item, like a lab report or assignment – but clearly getting a zero on an item you have to pass, like the final exam, will naturally cause a fail in the course (and perhaps a penalty beyond – see the Academic Calendar for the range of possible penalties). So ... do not cheat!!

If you find you are falling behind in understanding course material, come to my office hour – I am there to help! Chemistry is a wonderful subject and I can help with the tough stuff. You can also try e-mailing the Biochemistry and Chemistry Students Society for a private tutor -- usually a senior undergraduate – who might charge an hourly fee.

### **Advice on how to avoid plagiarism on TopHat assignments:**

Plagiarism is trying to get credit for work that is not yours. DO NOT text or e-mail (or post on class forums) your answer to any assignment question, at all. With online assignments where only the answer is entered, it is far too likely that your friend or a classmate will enter your answer as their own without doing the work themselves. The answer giver, as well as the plagiarizer, are both guilty of the plagiarism and that is academic misconduct.

Now here is what IS allowed. I typically try out a really hard question or two on each assignment, to challenge the bored A+ students but also to see if it is too hard for a test. If, say 1/4 of the class gets it right, I'll classify it as a "tough" question, and put it in my "tough" question pile, and that kind of question can appear on a test. But if only 1/20 of the class gets it right (say, 10 of you 200 students), then it is "too tough" for a test and I won't ask that kind of a question on a test. But suppose you are one of the 10 students who can actually solve the "too tough" question on the assignment, and you see in some student chat forum that everybody is going "aaaak I can't do the last question, it's impossible, what is Dr. East thinking, can anybody solve it?" and say you want to be helpful. You cannot say, "I figured that one out and the answer is 2.6 L." That is plagiarism. But if you say, "I figured it out, and what you do is convert the reactant masses to moles, figure out with the stoich which one is the limiting reactant, fully react that, then use stoich to get moles of the gas product, then convert to litres", THAT I would allow (some profs would, some profs might not). You're helping your classmates to learn, while not committing plagiarism because they still have to go off and do the calculation themselves. This also helps keep me from making tests too hard, because if you give the method out on a forum, maybe instead of 10 right answers, I'll see 60 right, and the question moves to my "tough" bin but the class now knows how to do it. If you instead help the class cheat by posting "it is 2.6 L" [DON'T DO THIS], then suddenly I'll see 180 right answers, the question moves to my "regular" pile, and more questions of that difficulty appear on the midterm, and still only 10 people know how to do it on a test.