

## CHEMISTRY 172

SUMMER 2023

### 1. General Information

**Coordinator:** Professor Emmanuel Hove

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**TA:** Yucong Xia

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### 2. Course Policies

- A Description of the course:** This course is a continuation of Chemistry 171, Introduction to Experimentation. You will learn additional general laboratory techniques. We will focus on some more advanced experiments including equilibria, kinetics and spectroscopy.
- B Absences:** The short time span of summer courses makes it impossible to offer make-up lab time for missed experiments. Additional points for missed experiments will be added for excused absences. Excuses will be accepted for illness, injury, or other truly uncontrollable event upon receipt of proper documentation. Documentation can include (but shall not be limited to) a doctor's note, or file number from the infirmary, police report for automobile accidents. For religious holidays, written notification is required at **least one** (1) week in advance. We will accept only one (1) absence for an authorized school function (sports, etc.) provided prior documentation is given. Verbal notification with written documentation after the fact will not be acceptable. **If you miss three(3) or more lab periods for any reason, you will either receive a failing grade or be asked to drop the course and take it another time.**
- C** All data must be collected in ink. **The use of correction fluid (e.g., "White Out"<sup>TM</sup> or "Liquid Paper"<sup>TM</sup>) is expressly forbidden.** You may only use pencil when instructed to do so. (It is always acceptable to use pencils in graphing; we even encourage it).

- D All reports are due the end of the period the day the experiment is completed. No late reports will be accepted; you will be given a zero for that experiment. Data collected during the first period of experiments that last more than one period must be turned in at the end of the first period. Failure to do so will result in a serious reduction in grade.
- E. You are being graded on the work you perform and the interpretations **you** make. Some experiments require you to work in pairs. This is **only** for the purpose of data collection. Obviously, the occasional question of a neighbor is allowed, but the work you submit **must** be your own.
- F You are expected to obey all instructions and be aware and observe all safety rules. Failure to observe these rules or instructions can result in you being expelled from the lab for the day. **This will not count as an excused absence and will count towards the maximum of three absences under B above.**

### 3. Required Items

A, Chem Kit

This kit includes all the disposable items you will need for the course, including safety goggles, paper towels, labels, etc. You may use your own goggles provided they offer the same level of protection, however we cannot offer a partial refund for unused materials including goggles. If you took 171 and still have most of the kit, check with the stockroom personnel to see if you need to purchase a new kit.

B. TEXTBOOK: General Chemistry. Available in the Rutgers New Brunswick bookstore

C. Experiment modules:  
Livingston Bookstore

D. Scientific calculator

4. **Dress Code**

- A. ANYONE PRESENT IN THE LABORATORY MUST BE PROPERLY DRESSED AT ALL TIMES.

This means proper eye protection, no open-toed shoes, no bare midriffs, no shorts or short skirts, tops must cover the entire shoulder (better still, the entire arm). No contact lenses, hard or soft, may be worn in the lab. Anyone not complying with these rules will be asked to leave the lab. This will not count as an excused absence. If you must leave the lab for some reason before you are finished, bring your goggles with you. As long as you are in the lab, you must wear goggles, even if you are no longer working with chemicals.

- B. No visitors are permitted in the lab. If you are finished with the day's experiment, turn in your lab report and leave. Friends or relatives waiting for you to finish should wait outside the lab or in the lobby outside Beck Auditorium.
- C. No food or drink may be brought into or consumed in the lab. For the purpose of this course, chewing gum is considered a food. Any container of food or drink brought into the lab may be considered contaminated and disposed of by laboratory personnel. This is especially true of unsealed containers of water or other drinks. Once the safety seal is broken, any fumes in the lab can penetrate the container and contaminate its contents.

## 5. Lab Schedule

Date	Experiment	Pts
7/11	Introductory Meeting	
7/12	Safety Orientation and Check in	
7/13	Safety Quiz <sup>2</sup> ANAL 416	50
7/18	ANAL 356	100
7/19	ANAL 356	-
7/20	PROP 421	50
7/25	RUTG 005	50
7/26	RUTG 005	50
7/27	EQUIL 392	50
8/01	EQUIL 441	50
8/02	EQUIL 499	50
8/03	Skills Test	25
8/08	EQUIL 443	50
8/09	PROP 344	50
8/10	Check out <sup>3, REVIEW</sup>	25
8/15	FINAL	150

ANAL 416 Determining the Percent Sodium Hypochlorite in Commercial Bleach

ANAL 356 Gravimetric Determination of Sulfate

PROP 421 Determining the Solubility of an Unknown Salt at Various Temperatures

PROP 344 Molecular Mass Determination by Freezing Point in t-Butyl Alcohol

RUTG 005 Chemical Kinetics; Determining the Activation Energy and Frequency Factor of the reaction between Methylene Glycol and bisulfite/sulfite

EQUIL 392 Introducing Equilibrium

EQUIL 441 Evaluating the Equilibrium Constant

SKILLS TEST Buret Reading, Weighing, Graphing and Analysis of Data, and Interpreting Graphical Data

EQUIL 499 Studying the pH of Strong Acid, Weak Acid, Salt, and Buffer Solutions

EQUIL 443 Studying the Effects of Buffering on the Resistance of a Solution

## 6. Grading

Both sections are graded independently of each other. The grade you receive in this course will be based on how many points you acquire as compared to the other students in your section.

Skills <sup>4</sup>	25
Lab reports	550
TA Evaluation	50
Check-out	25
Examination	150
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	800

Although there may be some variation, the breakdown within each section will be approximately:

A	20%
B	30%
C	40%
D or F	10%

Some adjustments in points will be made for student with excused absences. A grade of TF will be assigned to any student who owes money for breakage(usually \$50). A grade of F may be assigned to student who fails to check on time without a valid excuse. Please note: Purchase of a non-refundable airline ticket does **not** constitute a valid excuse.

### Notes

1. All readings, unless otherwise noted, are from CHEMISTRY, STRUCTURE AND PROPERTIES by NIVALDO TRO, 2<sup>nd</sup> Ed.(the Chem 162 text).
2. Every student must score 80% or better on the safety quiz. You will correct all answers and sign the safety quiz in ink. Every student must have a thorough and complete understanding of all the safety rules and follow them at all times. Students will not be allowed to work in the lab without first passing and signing the safety quiz.
3. You must check out of your drawer by Aug. 09. Starting Aug. 13, stockroom personnel will check out an remaining drawers, resulting in a \$50 deduction from your breakage deposit and the destruction of your lock. This could also result in a significant delay in your course grade until you reconcile any outstanding charges. No student will receive a passing grade who has not completed **all** the required parts of the course, including checking out.

4. There will be a skills test to assess your technical abilities.
5. The laboratory write-ups are graded on the basis of accuracy of the final results, and overall presentation, including the correctness of pre- and post-laboratory questions. An adjustment in total points will be made for excused absences.
6. Your TA will assess such things as basic understanding of the experiments, general lab skills, degree of preparedness, tidiness of work area, handling of chemicals and wastes, and cooperation in following and attention to TA's instruction.
7. There will be a single examination covering all the material in the course. Emphasis will be placed on calculations similar to those in the write ups, but any questions regarding the experiments is fair game.

### **Tips for successful completion of chemistry 172**

1. Read the experiment three times before coming to lab: once as soon as you've finished the last experiment, a second time just before bed, and a third time immediately prior to lab. This will give you enough time to clear up any concepts that are unclear before you begin the experiment. As a general rule, analytical and computational concepts are best learned when wide awake, rote memorization is retained better if it is fresh in the mind before sleeping.
2. Do not wait to solve problems. If you don't understand a lab, calculation, concept, etc., ask a TA immediately. If you don't understand the explanation, ask again. Use the office hours. If they are not convenient, try the other TA's office hour or see the coordinator. Additional help may be available from the Math and Science Learning Centre (Allison Road Classroom Building, Busch Campus) or the Learning Resource Center, Rm 111, Tillet Hall, Livingston Campus. Check with each of them for the availability of free tutors. I will try to place some material on reserve at each facility before the final.
3. Don't worry about the minor issues. One point here or there isn't going to matter. You are always entitled to an explanation of your grade, and if we do make a mistake, we will happily correct it. Worry about the things you can change. Even good students using good technique, this will be a rare event. In the end, students using better technique get better scores.
4. Try to answer the post-lab questions at home **before** the lab. At least read them and think about them. Sometimes, the answer becomes clearer after performing the experiment. Frequently, these questions clue you in on what to look for during the lab. The preliminary answers may well save you time during the lab period.

5. There is enough time in the lab period to do everything you need to. However, a little planning before hand can save you time. For example, if you have heated something up and are waiting for it to cool down, use that time to prepare the next step, or answer a post lab question, or start your calculations. Don't do too many things at the same time, but remember that often you can be doing two things.
6. Pay attention to your TAs, especially during the talks at the beginning of the period. They will explain how to perform the experiments and demonstrate the technical skills you will need to acquire. Even if you know how to do something, be quiet and pay attention. Someone else may not know, and everyone needs to be able to hear the instructor. The next time, you may not know and your neighbor will be the one talking.

#### 7. Students with disabilities:

**If you have a disability, please make the necessary arrangements for the lecturer to receive a letter of accommodation by the first week of the course, from your College Disability Concerns Coordinator, at, Disability Services (732 932 2848 or [dsoffice@rci.rutgers.edu](mailto:dsoffice@rci.rutgers.edu)), before the first exam. They will need to arrange for a live proctor ,via WebEx, when you are taking the exam on Sakai.**

**Websites** We will be using Canvas([URL:http://canvas.rutgers.edu/](http://canvas.rutgers.edu/)) as a classroom management system. You should check this site regularly. If you check it now, you will find a number of documents posted. You will need a a NetID to log in, so make sure that you have one for this site. If you are registered in this course and are a Rutgers student, you will automatically be a “member” of the online class. Under gradebook is where you will find your lab scores, exam scores and eventually your final grade.

ACADEMIC INTEGRITY AT RUTGERS: Students are expected to maintain the highest level of academic integrity. We will enforce that and you should be familiar with the university policy on academic integrity:

<http://academicintegrity.rutgers.edu/academic-integrity-policy/>

Violations will be reported and enforced according to this policy.

Use of external sources to obtain solutions to homework assignments or exams is cheating and a violation of the University Academic Integrity policy. Cheating in the course may result in penalties ranging from a zero on an assignment to an F for the course, or expulsion from the University. Posting of homework assignments, exams, recorded lectures, or other lecture materials to external sites without the permission of the instructor is a violation of copyright and constitutes a facilitation of dishonesty, which may result in the same penalties as explicit cheating.