

# Chemistry 3111: Introductory Analytical Chemistry Lab

## Course Syllabus, Fall 2023

Prelab Lecture: T, Th 11:15am-12:05pm, Smith 231

Lab: T,W,&Th 12:30pm-4:10pm Smith 310

2 Credits

Professor Kyle C. Bantz

Smith Hall 312

[Bantz008@umn.edu](mailto:Bantz008@umn.edu)

612-625-7816

### Course Description:

CHEM 3111 is the stand-alone lab component of 3101, however the course schedules will not match due to rotation experiments. In this course, you will learn quantitative analytical methods, method calibration, sample preparation, electrochemistry, spectrometry, and high-performance liquid chromatography. You will also be communicating much of what you are learning and your understanding in writing.

Chemistry and other scientific fields communicate important concepts, findings, results, and concerns using writing. Whether you stay in academia or move into industry or government positions after leaving the University of Minnesota, you will be communicating your science to other people. It is important that you practice and get in the habit of knowing different styles of communicating science to different audiences.

In chemistry you will be using writing in a few different ways:

- preparing and keeping a detailed lab notebook
- creating figures and tables with captions
- statistical analysis of data sets
- writing reaction schema and mechanisms
- reporting your findings in written form (lab reports)
- revising your writing

All of the writing that you perform in chemistry, inside and outside of this class, helps you think about your science, organize your thoughts, and engage with new ideas. Continually improving and working on your writing skills and scientific communication will help you in any career path you choose.

## Student Hours

Will be held in person this semester. The TA should be your first point of contact for lab related questions. Prof. Bantz's office hours are listed on the Canvas website.

## Teaching Assistants:

Teaching assistants monitor lab, and grade experiment lab reports. Check Canvas to see what TA is assigned to grade the lab report you are writing and when their zoom office hour will occur. Your TA's are also taking classes and doing research, so it may take them up to 24hrs to reply to your email. If you have questions about the lab reports or experiments it is best for you to ask your TA before emailing the course instructor.

### Issues with your Instructor or Teaching Assistants:

On occasion you may have a concern or problem regarding this course. I am very willing to discuss this with you. If, however, you wish to discuss it with someone other than your instructor, please contact Prof. Lee Penn, the director of the undergraduate chemistry program. You may e-mail them at [rleepenn@umn.edu](mailto:rleepenn@umn.edu) to arrange for a meeting or discuss via email. They will serve as a mediator in helping us resolve the issue.

## Email

My preferred mode of communication is email. I teach three courses during the semester, so in an effort to keep everything organized. When you email me with questions about this course please include CHEM 3111 in the subject of your email. You can expect a reply to your question within 24hrs and if you do not hear anything after that time span then send another email.

## Text

Quantitative Chemical Analysis by Daniel C. Harris and Charles Lucy, or [Analytical Chemistry 2.0](#)

## Website

[www.canvas.umn.edu](http://www.canvas.umn.edu)

Please check the Canvas site regularly for updated information. Canvas will be used to post lecture notes, classroom assignments, and grades.

## Other Materials

Access to a computer with Microsoft Excel and internet access  
Scientific calculator  
Bound paper notebook (composition notebook)

## Attendance:

It is expected that you will attend all lectures and watch all of the pre-lab videos. You are responsible for all material presented during lecture. **Attendance and performance of all lab experiments is required to pass the class.** That said, if you know this will be a problem, or in the event of an unexpected but legitimate absences as defined by the University (see section on University Policy below), it is your responsibility to bring this to the attention of the instructor ASAP, along with the proper verification (e.g. letter from the athletic coach, doctor's note, etc.).

## Assessment of Learning Outcomes and Grading

Student learning in this class will be assessed with quizzes, peer-review of writing, lab reports, lab notebooks, and technique points.

Category	Percentage
Lab reports	60%
Pre-lab work/quizzes/Peer Review	15%
lab notebook	15%
Analytical technique points	10%

The tentative course grading scale is:

90-100%: A to A-, 80-89%: B- to B+, 70-79%: C- to C+, 60-69% D- to D+, 0-59% F

I reserve the right to change this at any time during the semester. However, the lower limits for a particular letter grade will never be raised (i.e. the A range could be changed from 85-100, but never to 95-100). There is no curve – you only need to worry about your own performance.

## Pre-Lab lecture

It is essential that you attend the pre-lab lectures. We will be spending our time in lecture discussing how to analyze data analytically, what makes a good figure/graph/table, and how to write an analytical lab report.

## Pre-Lab Quizzes

These are short quizzes about the experimental procedure and videos to make sure you are prepared for your experiment. You will need to complete the quiz for the experiment you are doing in Canvas by 12:30pm the day of the experiment.

## Analytical Technique Points

For each experiment, your lab TA will assign “analytical technique points”. You will not lose points if you ask your TA how to use analytical equipment correctly. However, if you don’t ask and then use the equipment incorrectly you will lose points. The average for analytical chemistry is usually a 3-out-of-4 if you do the bare minimum before coming to lab (e.g. reading procedures, preparing your notebook, and taking the quiz). Coming late to lab will result in a zero for the lab day.

## Lab Notebook

Notebook guidelines and the grading rubric can be found on the Canvas in addition to within the LabArchives notebook. There is also an example in Canvas of an example of a well-kept paper notebook. There will be one planned and two surprise notebook checks during the semester. Your notebook needs to be a bound paper notebook.

## Lab Reports

Lab reports are to be uploaded to Canvas one week after the completion of the lab. In this course, we will be “building up” the lab reports, so you need to check the schedule for the group you are in to determine what needs to be included in your lab that week.

## Lab Report Types

### Core Reports

The “Core Lab Report” includes a title page, results, discussions, conclusion, and references.

### Figure Four

Using the template provided include a figure with a descriptive figure caption, the critical statistics, sources of systematic and/or random error, and a short concluding statement.

### Full Report

The Full report includes a title page, introduction, experimental, results, discussions, conclusion and references.

### Lab Report Revisions

Revisions may be performed on the first core report and last full lab report. **Any revisions made to the text of the original report should be done in red**, so that the TA can easily find the changes.

## Lab Report Submissions:

An electronic copy in **.doc or docx** format must be submitted online to the Canvas course website one week after the completion of your experiment by **12:30pm**. Include in your filename 1) Your name 2)the experiment name or number. Points will be deducted if the filename is incorrect. An example of a correct file name:

DoeJ-ISE-Joes.docx

**Late reports will lose 10% of the total points for being 24hrs late and 30% for being 48 hours late.** Any lab report submission over 48hrs late is a zero. You are encouraged to work together with your lab partner to analyze your data, discuss results, share ideas, etc. **However, reports must be written and composed individually, and each student is responsible for submitting their own work.** To ensure there is no plagiarism, all reports will be checked with Turnitin software. You must email the professor before the deadline if you are having issues uploading the document to Canvas. Any lab report regrade requests need to be in writing to the grading TA within 5 days of receiving your graded report and Prof. Bantz should be cc'ed on the email.

## Lab Report Rubric

Please see the lab report rubric documents on Canvas for a breakdown of what to include and grading criteria. Each time a report is referred to as a "Core Report" this means that the report must include: a title page, results, discussion, conclusion and reference sections.

## Stuff Happens Clause

The semester is long and sometimes unavoidable things come up. You may invoke the "stuff happens" clause on one assignment a semester. This gives you a no questions asked 48 hr extension on the assignment that is due. To use this clause please email me 1) before the assignment is due and 2) include "CHEM 3111 Stuff Happens" in the subject of your email and 3) in the text of the email please let me know which assignment you need the extension on and what lab section you are in.

## Scholastic Dishonesty:

You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration with another to falsify record or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing

a University academic record; or fabricating or falsifying data, research procedures, or data analysis. The university policy on student conduct and scholastic dishonesty may be reviewed at:

[https://regents.umn.edu/sites/regents.umn.edu/files/policies/Student\\_Conduct\\_Code.pdf](https://regents.umn.edu/sites/regents.umn.edu/files/policies/Student_Conduct_Code.pdf)

If it is determined that a student has cheated, he or she may be given an "F" or an "N" for the course and may face additional sanctions from the University. For additional information, please see:

<https://policy.umn.edu/education/instructorresp>

## **Use of ChatGPT/Bard/Chegg etc. and other Large Language Models:**

The Board of Regents [Student Conduct Code](#) states the following in Section IV, Subd.1: Scholastic Dishonesty:

"Scholastic dishonesty means plagiarism; cheating on assignments or examinations, including the unauthorized use of online learning support and testing platforms; engaging in unauthorized collaboration on academic work, including the posting of student-generated coursework on online learning support and testing platforms not approved for the specific course in question; taking, acquiring, or using course materials without faculty permission, including the posting of faculty-provided course materials on online learning and testing platforms; ..."

Artificial intelligence (AI) language models, such as ChatGPT, and online assignment help tools, such as Chegg®, are examples of online learning support platforms: they can not be used for course assignments except as explicitly authorized by the instructor. The following actions are prohibited in this course [remove bullets as necessary]:

- Submitting all or any part of an assignment statement to an online learning support platform;
- Incorporating any part of an AI generated response in an assignment;
- Using AI to brainstorm, formulate arguments, or template ideas for assignments;
- Using AI to summarize or contextualize source materials;
- Submitting your own work for this class to an online learning support platform for iteration or improvement.

If you are in doubt as to whether you are using an online learning support platform appropriately in this course, I encourage you to discuss your situation with me.

Any assignment content composed by any resource other than you, regardless of whether that resource is human or digital, must be attributed to the source through proper citation. (Examples of citing content composed by digital tools are presented in: [libguides.umn.edu/chatgpt](http://libguides.umn.edu/chatgpt) [or provide an alternative reference appropriate for your class].)

Unattributed use of online learning support platforms and unauthorized sharing of instructional property are forms of scholastic dishonesty and will be treated as such.

## **Disability Services:**

Please notify the instructor immediately if you have a disability that might affect your ability to fully meet the requirements of the course so that appropriate accommodations can be made. A letter from the Office of Disability Services ([www.ds.umn.edu](http://www.ds.umn.edu)) will be required. A detailed description of the University policy on disability services may be reviewed at:

<http://regents.umn.edu/sites/regents.umn.edu/files/policies/DisabilityServices.pdf>

## **Other Important University of Minnesota Policies:**

For additional information on other applicable university policies/resources, please see the links below

### **Online Learning Expectations:**

<https://communitystandards.umn.edu/know-code/online-learning-expectations>

### **Student Conduct Code:**

[http://regents.umn.edu/sites/regents.umn.edu/files/policies/Student\\_Conduct\\_Code.pdf](http://regents.umn.edu/sites/regents.umn.edu/files/policies/Student_Conduct_Code.pdf).

### **Use of Personal Electronics in the Classroom:**

<http://policy.umn.edu/education/studentresp>.

### **Grading Definitions:**

<http://policy.umn.edu/education/gradingtranscripts>.

### **Sexual Harassment:**

[https://regents.umn.edu/sites/regents.umn.edu/files/policies/Sexual\\_Harassment\\_Sexual\\_Assault\\_Stalking\\_Relationship\\_Violence.pdf](https://regents.umn.edu/sites/regents.umn.edu/files/policies/Sexual_Harassment_Sexual_Assault_Stalking_Relationship_Violence.pdf)

### **Equity, Diversity, Equal Employment Opportunity, and Affirmative Action:**

We welcome to this course individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability, and other visible and invisible differences. Instructors, teaching assistants, and students are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class. This is in agreement with university policy:

[http://regents.umn.edu/sites/regents.umn.edu/files/policies/Equity\\_Diversity\\_EO\\_AA.pdf](http://regents.umn.edu/sites/regents.umn.edu/files/policies/Equity_Diversity_EO_AA.pdf)

For information on the Diversity and Inclusion Committee in the Chemistry Department, see:

<https://sites.google.com/umn.edu/chemintranet/diversity-inclusion>

"Collaboration among people of all cultures and backgrounds enhances our experiences and contributes to excellence in teaching, learning, and research. We strive for a climate that celebrates our differences and strengthens our department by embracing and working to increase diversity, equity, and inclusion."

For the Gender and Sexuality Center for Queer and Trans Life, see:

<https://gsc.umn.edu/>

For gender-neutral restrooms in Smith and Kolthoff Halls and elsewhere on campus, see:

<https://sites.google.com/umn.edu/chemintranet/accessible-gender-neutral-restrooms>

**Stress and Mental Health Management:**

<http://www.mentalhealth.umn.edu>.

**Disability Accommodations:**

<https://diversity.umn.edu/disability/>

**Appropriate Student Use of Class Notes and Course Materials:**

<http://policy.umn.edu/education/studentresp>.

**Academic Freedom and Responsibility:**

Academic freedom is a cornerstone of the University. Within the scope and content of the course as defined by the instructor, it includes the freedom to discuss relevant matters in the classroom. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. Students are free to take reasoned exception to the views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled.\*

Reports of concerns about academic freedom are taken seriously, and there are individuals and offices available for help. Contact the instructor, the Department Chair, your adviser, the associate dean of the college, or the Vice Provost for Faculty and Academic Affairs in the Office of the Provost.

*\* Language adapted from the American Association of University Professors "Joint Statement on Rights and Freedoms of Students".*

**Missed Exams**

In the case of a true emergency, serious illness, or University-related trip that prevents a student from taking a midterm exam, an excused absence may be granted in strict accordance with University policy (see link below). To obtain an excused absence, students must contact the instructor in advance OR as soon as circumstances allow to discuss the nature of the emergency. Documentation will be required. The unweighted average score of all the student's other exams will replace the zero from the excused midterm exam. Only one missed midterm exam will be replaced in this fashion. If circumstances prevent a student from taking more than one midterm exam, a meeting must be scheduled as soon as possible with the instructor to discuss any options available.

<http://www.policy.umn.edu/Policies/Education/Education/MAKEUPWORK.html>

Students on University teams playing out of town may be able to take the exam with the coach or an instructor as proctor; please see the course instructor about this early so arrangements can be made. For information on missing the final exam, see "Incompletes".



## Incompletes

Students who have an EXCUSED ABSENCE from the Final Exam, and have taken the all midterm exams, may be eligible to receive a grade of "I" in the course. Incompletes will not be granted if a student has missed earlier exams, or is not passing based on the work up to the final. You need to fill out an incomplete request form (available in Smith 115) and have it signed. See me for details. This grade is NOT routinely assigned! Any incomplete must be made up in the following semester. After that time all incompletes will turn into F grades.

## Tentative Schedules

### Tentative Lecture/Lab Schedule

Week	Date	Prelab topic	lab experiment	what's due
1	Sep 5 (7)	Welcome and Analytical Glassware	check in	worksheet
2	Sep 12 (14)	Error Propagation and Statistics	practice titration	core report
3	Sep 19 (21)	Data Analysis	no lab	
4	Sep 26 (28)	Calibration/peer review	no lab	
5	Oct 3 (5)	Analytical Introductions	Rotation #1	figure 4 and introduction
6	Oct 10 (12)	Peer review of introductions	Rotation #2	core report
7	Oct 17 (19)	Figures and Tables	no lab	
8	Oct 24 (26)	Experimental Sections	Rotation #3	figure 4 and experimental
9	Oct 31 (Nov 2)	Peer review of experimental	Rotation #4	core report
10	Nov 7 (9)	no prelab	no lab	
11	Nov 14 (16)	Quality Control	Rotation #5	full lab report
12	Nov 21 (23)	no prelab	no lab	
13	Nov 28 (30)	Full Report Peer Review	Rotation #6	figure 4

14	Dec 5 (7)	no prelab	checkout	
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