

# Syllabus

## CHM 3120L ANALYTICAL CHEMISTRY LABORATORY

### Fall 2024

Faculty Instructor: Dr. Alexander Jacobs, Leigh 202A  
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Office Hours Wednesday 3pm-4pm Leigh Hall 202  
Or by appointment  
Simultaneously by Zoom ID: 985 770 6216 Password: Officehr

|                      |               |                       |
|----------------------|---------------|-----------------------|
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#### Undergraduate Teaching Assistants:

|                   |                      |
|-------------------|----------------------|
| Samih Samaan      | Danielle Haddad      |
| Keen Zhang        | Alexis Forgatsch     |
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| Danyella Cabrera  | Ritvik Bhattacharyya |
| Audrey Barber     | Michael Yao          |
| Kaelynn Rodriguez | Quinn Shepard        |
| Fabian Kume       | Doireann Doherty     |
| Micayla Vereb     | Rishi Karpur         |

**Course Website:** Canvas; Please visit the website regularly for announcements and resources. Everything is posted under "Files"

Videos available at: <https://www.chem.ufl.edu/undergraduate/courses-and-curriculum/chemistry-laboratories/analytical/>

### Required Materials

**Laboratory Manual:** No lab manual is required. All materials will be posted on the e-learning site, under Files.

**Laboratory Notebook:** Any sensible laboratory notebook, to be used only for this lab, is suitable. You will turn in scans or photos of your notes, retaining the original notebook for your own use. Please be sure that what you submit is legible and clear.

**Laboratory Attire:** The Essentials: Long, loose-fitting pants, full shirt, shoes which cover the feet, departmentally-approved safety glasses, tie-back for long hair.

### Course Objectives

CHM 3120L is an introductory laboratory course in Analytical Chemistry. By the end of the semester, students are expected to demonstrate:

- proper laboratory techniques for quantitative chemical measurements including accuracy on unknowns
- knowledge of a select group of analytical methods
- competence in data analysis, statistics and preparation of professional laboratory reports

### Grading

Your grade will be determined by the accuracy of your results, the quality of your reports, the quality of your laboratory notes, your competence in essential laboratory manipulations, and your performance on written quizzes. Grades will be posted in the Canvas gradebook.

|                              |               |            |
|------------------------------|---------------|------------|
| Accuracy                     | 6 @ 35 points | 210        |
| Questions, Reports and Notes | 8 @ 70 points | 560        |
| Practical Exams              | 4 @ 40 points | 160        |
| Written Quizzes              | 3 @ 45 points | <u>135</u> |
|                              |               | 1065 total |

The following grading scale will be used:

| <u>Letter Grade</u> | <u>Percentage</u> | <u>Letter Grade</u> | <u>Percentage</u> | <u>Letter Grade</u> | <u>Percentage</u> |
|---------------------|-------------------|---------------------|-------------------|---------------------|-------------------|
| A                   | ≥93               | B-                  | ≥80               | D+                  | ≥67               |
| A-                  | ≥90               | C+                  | ≥77               | D                   | ≥64               |
| B+                  | ≥87               | C                   | ≥73               | E                   | <60               |
| B                   | ≥83               | C-                  | ≥70               |                     |                   |

There may be a curve, there may not be a curve.

#### **Notes:**

- 1) Prior to the first lab, visit the e-learning site and review Preliminary Handouts 1-3, 5: laboratory safety, basic lab rules, laboratory notebook, and fundamental techniques. Also read the handout for Experiment #1.
- 2) You will need to bring a copy of the lab experiments to your lab period. This can be done with either a print out, on a tablet or a laptop. It is advised not to use your phone.
- 3) On the first day, you select a workstation. This is where you will complete your experiments. Everything you will need will be at that station.
- 4) A minimum of 18 out of 35 accuracy points will be given if the experiment is performed, the results are calculated correctly, and deadlines are met. For labs with an unknown number, the number must be reported or will get an accuracy score of zero.
- 5) For labs 1-5, there will be questions at the end of the lab handout. You will turn in the answers to these questions and calculations along with your results, tabulated and presented nicely. Starting with lab 2, you will be asked to write a section of a lab report (Intro, Experimental, Results and Discussion and Conclusion) with each lab. For lab 6 and 7, you will be writing a full lab report. More details will be given about each section as the semester goes on. There are some examples of lab reports on Canvas. Videos covering scientific writing will be posted to Canvas.
- 6) Lab reports and answers to questions must be typed. By lab 2, all calculations must be shown through Microsoft Equation Editor.
- 7) A copy of your lab notes must be submitted with your reports. Lab notes may be taken with a notebook or a tablet, but they must be handwritten in some form. A spreadsheet does not count as lab notes.
- 8) Lab reports are due at the specified time on Canvas for your section
- 9) A 10% penalty off the final score of the report will be assessed each time a result or report is submitted late. The maximum permissible late time is one week.
- 10) All written work (late or otherwise) must be received by 3:00 PM on December, 12/11/24.
- 11) Each student is expected to pass laboratory practical exams on four essential analytical skills (use of the analytical

balance/weighing by difference, quantitative transfer/use of a volumetric flask, use of glass pipets and use of micropipettes). The tests will be given by the TA during the regular laboratory period at times mutually acceptable to both the student and the TA.

- 12) Three written quizzes will be given on the dates specified on the schedule. Quizzes will be given on Canvas. They are open note, but you must work alone. If you wish to go over your quiz, please contact your TA. The questions in your lab write ups will greatly help you prepare for the quizzes.
- 13) Attendance is required at all scheduled laboratory periods, unless you are informed otherwise by your TA or the instructor.
- 14) Plagiarism will not be tolerated. Students are expected to obey the University of Florida Honor Code, detailed at

The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructors or TAs in this class.

You are required to abide by the Student Honor Code. Any violation of the academic integrity expected of you will result in a minimum academic sanction of a zero on the assignment. Any alleged violations of the Student Honor Code will result in a referral to Student Conduct and Conflict Resolution. Please review the Student Honor Code and Student Conduct Code at <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code>

- 15) Make-ups will be granted only when justified. If you know ahead that you will have to miss lab, notify your TA and Dr. Jacobs in advance. If you are sick and cannot reach anyone before lab, you will have to present written evidence of the illness. **If you are not feeling well, do not come to lab.** There are 7 sections of lab, make ups are easy to fit in.
- 16) If you are involved in a laboratory accident, you must go to the infirmary for treatment.
- 17) Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation.
- 18) Should school be closed due to a storm, the weeks off due to Homecoming/Veteran's Day will be used for makeups.

Course Fees: You have already paid this, but the fee for this course is \$45.00

## Laboratory Schedule

**Note:** Note that the schedule may change due to weather/holidays/pandemic

| Dates (starting date)                            | Preparation                            | Lab Work   | Quizzes   | Assignment Due   |
|--|--|--|---|--|
| <b>Begin Aug 22<sup>nd</sup>/26<sup>th</sup></b> |  | No lab (add/drop week)   |   |  |
| Week 2 (week of Sept 2 <sup>nd</sup> )           |  | No lab due to Labor Day  |   |  |
| Week 3 (week of Sept 9 <sup>th</sup> )           | Read Handouts 1-6<br>Read Experiment 1 | Check in<br>Experiment 1<br>Balance use<br>Pipet use/calibration                                   |   |  |
| Week 4, (week of Sept 16 <sup>th</sup> )         | Read Handout 7<br>Read Experiment 2    | Begin Soda Ash Titrations<br>HCl/NaOH titrations   |   | Experiment 1 results and lab notes   |
| Week 5 (week of Sept 23 <sup>rd</sup> )          | Review handouts to prepare for Quiz 1  | KHP/NaOH titrations<br>Finish Soda Ash   | Quiz 1 and<br>Deadline for<br>Weighing<br>Practical |  |
| Week 6 (week of Sept 30 <sup>th</sup> )          | Read Experiment 3                      | Beer's Law measurement   |   | Soda Ash questions, results, <u>Introduction</u> and notes due             |
| Week 7 (week of Oct 7 <sup>th</sup> )            | Read Experiment 4                      | Spectrophotometric Fe  |   | Beer's Law questions, results, <u>Experimental</u> and notes due           |
| Week 8 (week of Oct 14 <sup>th</sup> )           |  | No lab due to Homecoming   |   |  |
| Week 9, (week of Oct 21 <sup>st</sup> )          |  | Spectrophotometric Fe<br>Finish Lab 4  | Quiz 2<br>Deadline for<br>Pipetting<br>Practical    |  |
| Week 10 (week of Oct 28 <sup>th</sup> )          | Read Experiment 5<br>Watch ISE video   | Chloride Ion Selective<br>Electrodes   |   | Spec Fe questions, results, <u>Results and Discussion</u> and notes due    |
| Week 11 (week of Nov 4 <sup>th</sup> )           | Read Experiment 6                      | Fluorescence of Quinine;<br>Standard additions and<br>Determination of quinine in<br>cinchona bark | Deadline for<br>volumetric flask<br>practical       | ISE questions, results, <u>Conclusion</u> and lab notes due                |
| Week 12 (week of Nov 11 <sup>th</sup> )          | No in person lab this week             | At home Chromatography assignment  | Quiz 3  | Quinine in tonic water report and notes due (Monday class due on Nov 12th) |
| Week 13 (week of Nov 18 <sup>th</sup> )          | Read Experiment 7                      | Chromatography of Coffee   | Deadline for<br>Micropipette<br>Practical           | At home Chromatography assignment  |

|   |  |                            |  |   |
|---|--|----------------------------|--|---|
| Week 14 (week of Nov 25 <sup>th</sup> ) |  | No lab due to Thanksgiving |  |   |
| Week 15 (week of Dec 9 <sup>th</sup> )  |  |                            |  | Chromatography of Coffee report and notes due |