Chemistry 112L – Principles of Chemistry Laboratory  Fall 2022

All 112L Sections, Instructors, Dates, Times, Contact Information

<table>
<thead>
<tr>
<th>Section</th>
<th>Instructor</th>
<th>Date</th>
<th>Time</th>
<th>Contact information</th>
<th>Office Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dr. Cory</td>
<td>M</td>
<td>1:00-4:00 pm</td>
<td>SSMB 314 <a href="mailto:coryw@cofc.edu">coryw@cofc.edu</a></td>
<td>Monday 11-12 Tuesday 10-11</td>
</tr>
<tr>
<td>2</td>
<td>Dr. Cory</td>
<td>T</td>
<td>1:40-4:40 pm</td>
<td>SSMB 314 <a href="mailto:coryw@cofc.edu">coryw@cofc.edu</a></td>
<td>Monday 11-12 Tuesday 10-11</td>
</tr>
<tr>
<td>3</td>
<td>Dr. Mitchell</td>
<td>T</td>
<td>6:30-9:30 pm</td>
<td>SSMB 124 <a href="mailto:wigginsmitchelln@cofc.edu">wigginsmitchelln@cofc.edu</a></td>
<td>by appointment</td>
</tr>
<tr>
<td>4</td>
<td>Dr. Gailbreath</td>
<td>W</td>
<td>12:05-3:05 pm</td>
<td>SSMB 114 <a href="mailto:gailbreathbd@cofc.edu">gailbreathbd@cofc.edu</a> 843-953-3093</td>
<td>by appointment</td>
</tr>
<tr>
<td>5</td>
<td>Dr. Gailbreath</td>
<td>W</td>
<td>3:30-6:30 pm</td>
<td>SSMB 114 <a href="mailto:gailbreathbd@cofc.edu">gailbreathbd@cofc.edu</a> 843-953-3093</td>
<td>by appointment</td>
</tr>
<tr>
<td>6</td>
<td>Prof. Potter</td>
<td>Th</td>
<td>1:40-4:40 pm</td>
<td>SSMB 122 <a href="mailto:cpotter@cofc.edu">cpotter@cofc.edu</a> 843-953-7551</td>
<td>by appointment</td>
</tr>
</tbody>
</table>

Note: The syllabus is subject to change by the instructors. Any changes will be announced and posted on OAKS.

Class Location: SSMB 115

Pre-requisites: CHEM 111, CHEM 111L, MATH 111 or equivalent
Co-requisite: CHEM 112 and CHEM 112L are co-requisite courses. If you withdraw from one you must withdraw from the other.

Required Materials:
1. Lab Manual “CHEM 112L: Research-Based Laboratory Manual” (version 11)
2. Composition book (sewn pages) to serve as lab notebook.
3. Ballpoint pen, black preferred for all lab notebook recording
4. Scientific calculator with logarithmic and exponential functions
5. Box of nitrile gloves (at least 50 gloves per box is recommended) – can be purchased at drug store (ex. CVS, Walgreens). Do not bring polyvinyl or latex gloves.
6. Socks that cover your ankles
7. Pants that cover your ankles
8. Safety goggles, safety glasses, or face shield

Required Software:

OAKS: OAKS will be used for this course throughout the semester to provide the syllabus and class materials and grades for each assignment, which will be posted.
Course Catalog Description: A laboratory course designed to introduce students to the application of the scientific method in solving chemical problems and to acquaint them with specific tools and techniques used in the chemistry laboratory, while reinforcing and illustrating concepts encountered in lecture. Laboratory three hours per week.

Student Learning Outcomes:
1. Practice scientific method in a chemistry laboratory setting
2. Perform the following techniques in a laboratory setting: pipetting, preparing solutions in volumetric flasks, sonication, centrifugation
3. Prepare solutions of a tablet sample, headache powder, and standard material in the laboratory
4. Employ mathematical manipulations using acquired data
5. Interpret scientific data

General Education Student Learning Outcomes:
1. Students apply physical/natural principles to analyze and solve problems.
2. Students develop an understanding of the impact that science has on society.

These outcomes will be assessed in the final lab report and an assessment assignment. This assignment will account for 20% of the total course grade.

Instructional Objectives: This semester of CHEM 112L will include a semester-long research project in which we will investigate the degradation of melatonin (a sleep medication) in pills stored under extreme conditions (high heat and humidity). Lab techniques we will learn and use in our research include UV/Vis spectrophotometry, pH measurement, and high performance liquid chromatography (HPLC). Preparation of a buffer and quantitative solutions will be a part of the research project, as well as the use of a sonicator and centrifuge.

Attendance Policy: Labs are experiential learning courses that emphasize the scientific method and data interpretation and they provide training in essential technical skills for chemists and other scientists. Furthermore, the technical lab skills presented in one course are assumed to have been mastered in subsequent chemistry courses. Thus, attendance in all lab periods is mandatory.

That being said, do not attend lab if you are sick or under quarantine. If you have to miss lab, you must notify your professor before the beginning of the scheduled lab period to be eligible to do a makeup assignment for the lab. Be prepared for your instructor to ask you to share documentation of illness. If you do not, you will be assigned a grade of zero for all items due that week. Likewise, if a makeup assignment is not completed within the time allowed by the instructor, you will be assigned a zero for that assignment.

Because excessive (>2 missed lab periods) absences from lab will diminish your lab experience and are a significant strain on your instructor, please do not request these accommodations unless absolutely necessary. Again, be prepared for your instructor to ask you to share documentation of illness. If you miss more than two weeks of lab for any reason, you must talk to your professor about your options, including withdrawing and retaking it in a future semester when you are able to fully participate in the class. A makeup assignment due to illness or quarantine is only guaranteed for a maximum of two weeks during the semester.

You must be on time for lab. Prelab instruction begins at the start of lab and you must hear about the day’s lab experiment and associated safety concerns. The lab door will be locked 5 minutes after the beginning of lab; if the door is locked and you miss lab because of this, you will get a grade of zero.
Lab Notebook: Each week, the procedure for the experiment to be performed should be written into your lab notebook before lab begins. You may also use drawings to describe what you will be doing in lab if you prefer. There will be short instructional videos posted on OAKS to help you visualize what you are supposed to do each week. You do not need to write instructions for using equipment in your lab notebook (e.g., pH meter, SpectraSuite software). You will upload a scan of your lab notebook to the OAKS Dropbox by 9:00 am the morning of the day of your lab so your instructor has time to look it over before lab. Therefore, do not wait until right before lab to look at the procedure for that week. Additional notes can be added when you attend a brief prelab lecture.

A laboratory notebook should provide a full record of what was performed during the experiment. Most importantly, all data must be recorded in your lab notebook as soon as it is generated. All calculations should be shown in the laboratory notebook such that the instructor may follow your logic and check for calculation errors. Your laboratory instructor will check, initial and date your notebook data at the end of each experiment to ensure that everything is properly recorded (and will give you valuable feedback if it is not). Each student is expected to observe the College of Charleston Policy on Scientific Integrity (found in your lab manual) and the College of Charleston Honor Code found in this syllabus.

Weekly assignments and report sheets: Assignments will include weekly lab report sheets (found in your lab manual) and some writing assignments. In general, lab report sheets will be completed the same day as the experiment and turned into the instructor before you leave lab. Writing assignments will be completed outside of lab and your instructor may request that they are submitted as a printed document at the start of the follow lab period and/or electronically via OAKS Dropbox.

Final Lab Report: The final project will be a lab report describing the research conducted on melatonin pills. With your final lab report, you will turn in a folder containing all drafts of previous graded and peer-reviewed writing assignments. The final report will also be submitted online and be checked using Turnitin software to assess plagiarism. If any part of the report is found to be plagiarized, the report will be given a grade of zero and the incident will be reported to the Dean of Students. See the schedule for the due date of the final report.

Turnitin: All written assignments will be submitted to an OAKS Dropbox and analyzed by Turnitin to detect plagiarism and to evaluate writing and grammar. By submitting your written work to Turnitin, "you hereby grant to Turnitin, its affiliates, vendors, service providers, and licensors a non-exclusive, royalty-free, perpetual, worldwide, irrevocable license to use such papers, as well as feedback and results, for the limited purpose of a) providing the Services, and b) for improving the quality of the services generally. If you have any questions, please refer to the End User Agreement found at https://turnitin.com/agreement.asp"

Inclement Weather, Pandemic or Substantial Interruption of Instruction: If in-person classes are suspended, faculty will announce to their students a detailed plan for a change in modality to ensure the continuity of learning. All students must have access to a computer equipped with a web camera, microphone, and Internet access. Resources are available to provide students with these essential tools.

Disability Services: The College will make reasonable accommodations for persons with documented disabilities. Students should apply for services at the Center for Disability Services/SNAP located on the first floor of the Lightsey Center, Suite 104. Students approved for accommodations are responsible for notifying their instructor as soon as possible and for contacting their instructor one week before accommodation is needed.
**College of Charleston Honor Code and Academic Integrity:** Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when suspected, are investigated. Each incident will be examined to determine the degree of deception involved.

Incidents where the instructor determines the student’s actions are related more to misunderstanding and confusion will be handled by the instructor. The instructor designs an intervention or assigns a grade reduction to help prevent the student from repeating the error. The response is recorded on a form and signed both by the instructor and the student. It is forwarded to the Office of the Dean of Students and placed in the student’s file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XXF in the course, indicating failure of the course due to academic dishonesty. This status indicator will appear on the student’s transcript for two years after which the student may petition for the XX to be expunged. The F is permanent.

Students can find the complete Honor Code and all related processes in the Student Handbook at: [http://deanofstudents.cofc.edu/honor-system/studenthandbook/](http://deanofstudents.cofc.edu/honor-system/studenthandbook/).

**Always remember, Safety First!**
If you do not have the appropriate safety gear, you will not be allowed to work in the lab. You will be told to leave. No exceptions.

1. You must wear your **safety goggles** or **safety glasses** at all times in the lab.
2. **Long pants** are required. You must have full coverage down to your shoes (wear socks).
3. **Lab coats** are required to ensure full coverage and protect your clothes.
4. **Nitrile gloves** must be worn when working with solutions and other reagents.
5. **Footwear** must provide adequate protection to the entire foot. Sandals, open toe shoes, mesh top shoes, boat shoes and shoes with extremely high or narrow heels are considered inappropriate for laboratory conditions and will not be permitted. No skin should be visible below the knees.
6. **Socks** are required. If you wear leggings/pants and ankle socks to class, you will be asked to leave until you have socks that cover your ankles. No skin should be visible below the knees.
7. You are advised to tie back **long hair**.
8. You are required to watch the lab safety PowerPoint that is presented by your instructor and pass the safety quiz with a minimum grade of 70%.

**Lab Clean-up:** The cleanliness of the lab is related to the safety of the lab. It is your responsibility to clean all glassware you use and leave a clean station. Points will be deducted from your weekly lab assignment(s) if you leave before cleaning. Your instructor will check your station each week.
Grading Scheme:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Grade Percentage</th>
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<tbody>
<tr>
<td>Lab Notebook</td>
<td>20%</td>
</tr>
<tr>
<td>Lab Safety and Rules</td>
<td>5%</td>
</tr>
<tr>
<td>Assignments and report sheets</td>
<td>55%</td>
</tr>
<tr>
<td>Final Lab Report</td>
<td>20%</td>
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</table>

Letter Grades and Percentage Ranges

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>XXF</th>
<th>F</th>
<th>D</th>
<th>C-</th>
<th>C</th>
<th>C+</th>
<th>B-</th>
<th>B</th>
<th>B+</th>
<th>A-</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numerical grade</td>
<td>Failure due to dishonesty</td>
<td>Below 70</td>
<td>70</td>
<td>71-72</td>
<td>73-74</td>
<td>75-79</td>
<td>80-82</td>
<td>83-86</td>
<td>87-89</td>
<td>90-92</td>
<td>93-100</td>
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Mental & Physical Wellbeing: At the college, we take every student mental and physical wellbeing seriously. If you find yourself experiencing physical illnesses, please reach out to student health services (843.953.5520). And if you find yourself experiencing any mental health challenges (for example, anxiety, depression, stressful life events, sleep deprivation, and/or loneliness/homesickness) please consider contacting either the Counseling Center (professional counselors at http://counseling.cofc.edu or 843.953.5640 3rd Robert Scott Small Building.) These services are there for you to help you cope with difficulties you may be experiencing and to maintain optimal physical and mental health.

Food & Housing Resources: Many CofC students report experiencing food and housing insecurity. If you are facing challenges in securing food (such as not being able to afford groceries or get sufficient food to eat every day) and housing (such as lacking a safe and stable place to live), please contact the Dean of Students for support (http://studentaffairs.cofc.edu/about/salt.php). Also, you can go to http://studentaffairs.cofc.edu/student-food-housing-insecurity/index.php to learn about food and housing assistance that is available to you. In addition, there are several resources on and off campus to help. You can visit the Cougar Pantry in the Stern Center (2nd floor), a student-run food pantry that provides dry-goods and hygiene products at no charge to any student in need. Please also consider reaching out to Professor ABC if you are comfortable in doing so.

Inclusion: The College of Charleston offers many resources for LGBTQ+ students, faculty and staff along with their allies.

Preferences Name and Pronoun Information
Campus Resources
National Resources for Faculty & Staff
Documenting LGBTQ Life in the Lowcountry
College of Charleston Quality Enhancement Plan (QEP)
Articles about CofC and LGBTQ+ Issues
## Chemistry 112L – Principles of Chemistry Laboratory

### Fall 2022

<table>
<thead>
<tr>
<th>Wk</th>
<th>Date*</th>
<th>Experiments</th>
<th>Sample Pull</th>
<th>Assignment due</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8/29 – 9/1</td>
<td>Safety Presentation, safety quiz</td>
<td></td>
<td>None</td>
</tr>
</tbody>
</table>
| 2  | 9/5 – 9/8 | How to use ChemDraw  
Prepare melatonin pill samples for storage in environmental chamber | put in chamber | ChemDraw Assignment |
| 3  | 9/12 – 9/15 | How to use Web of Science  
Making standard solutions and serial dilutions with quantitative glassware | | Report Sheet (RS) 3 |
| 4  | 9/19 – 9/22 | Analyzing standard solutions and serial dilutions with UV/Visible Spectrophotometry  
Using Excel for Lab Data | 2-week | Summaries of 2 research papers  
RS 4 |
| 5  | 9/26 – 9/29 | Making a 50 mM formate buffer pH = 3.0 | | RS 5 |
| 6  | 10/3 – 10/6 | How to write a lab report  
HPLC of aspirin, acetylsalicylic acid, and caffeine | 4-week | RS 6 – p 1 & 2 |
| 7  | 10/10 – 10/13 | Peer Review of Introduction  
Interpretation of aspirin, acetylsalicylic acid, and caffeine HPLC results | | Bring Introduction section – 2 copies, one with name, one without  
RS 7 |
| 8  | 10/17 – 10/20 | Preparing exposed and control melatonin samples and conducting HPLC analysis | 6-week | None |
| 9  | 10/24 – 10/27 | Continue preparing exposed melatonin and control samples and conducting HPLC analysis | 7-week* | None |
| 10 | 10/31 – 11/3 | Peer Review of Methods and Materials  
Interpretation of melatonin HPLC data, individual and group | | Bring Methods and Materials section – 2 copies  
(name/no name)  
RS 9 |
| 11 | 11/9 – 11/15 | Peer Review of Results and Discussion  
Pool and discuss melatonin data from all sections  
Discuss impact of inactive ingredients, degradation products | | Bring Results and Discussion section – 2 printed copies  
(name/no name) |
| 12 | 11/16 – 11/22 | LAB REPORTS DUE AT BEGINNING OF LAB  
Peer Review of Lab Reports  
Evaluations and Surveys | | Science-Based Persuasive Writing Assignment  
Bring Final Report – 2 printed copies  
(name/no name) |
| 13 | 11/28 – 12/1 | FINAL LAB REPORT DUE  
Lab Notebook due  
Equilibrium Problem Review | | Lab Notebook,  
Final Report with peer review feedback incorporated – one printed copy with name, also e-mail pdf copy |

*instead of 8-week  
**The week of Fall Break, lab will meet Wednesday – Friday.  
**The week of Thanksgiving Break, lab will meet Monday and Tuesday.  

Grades due: Wednesday, December 14, 2022 by 5 pm