



- Calculator with scientific notation
- Access to internet and UMW library

### **Course Description:**

This laboratory course (along with CHEM 319) is designed to demonstrate and teach the techniques utilized in the biochemical sciences. This semester will focus on experiments involving identification of carbohydrates, partial purification of biological materials, chromatography, characterization of biological samples, and enzyme kinetics.

After completing the course, a student should be able to

- Build on the initial laboratory skills developed in CHEM 319
- Conduct experiments on isolation and characterization of biological mixtures
- Design and conduct a biochemical experiment
- Work with peers to conduct biochemical investigations
- Record, interpret, report with appropriate visual means and explain results of an experiment

The course is designated as writing intensive. It is important that students learn to communicate in written fashion such that peers in the field can understand the scientific findings and conclusions addressed in the paper. In the course assignments, you will be expected to communicate in the same style used by biochemists in industry, academic, or government settings.

### **Writing Intensive Learning Outcomes:**

- **Ideas** (focused, substantial, clearly presented, sufficiently and appropriately elaborated with explanations, supporting details, and/or reasons or evidence)
- **Organization** (recognizable structure, logical sequence, clear transitions, purposeful)
- **An appropriate writer's voice** (tone, word choice, and degree of formality fit the context, communicates confidence in addressing readers' expectations, establishes credibility, a recognizable "persona" who "speaks")
- **Conventions of correctness and presentation** (editing reflects knowledge of conventions of punctuation, spelling, formatting, fair use of sources, documentation, etc.)

### **Expectations of Students:**

- 1) Students may not work on experiments outside of the assigned laboratory time (8:00 a.m. – 12:15 a.m. Thursday) without the explicit permission of the instructor and may not work in the laboratory alone.
- 2) Each student is required to individually complete the data analysis as well as any written assignments for the course. You may consult the literature or Dr. Slunt, but you may not seek assistance from any other faculty member (including other disciplines) or student. Details of

these assignments follow in this syllabus and on Canvas.

3) Besides unknown samples and any solutions already prepared and available, the students will prepare all solutions themselves. You will need to include descriptions of how the solutions will be prepared, amounts needed, etc. on your pre-laboratory assignment.

**Attendance:**

Attendance in the laboratory is mandatory. Excused/make-up laboratories will only be arranged for exceedingly unavoidable circumstances (death in family, hospitalization, documented illness, graduate school, professional school or job interview, athletic competition, disability related absence accommodation, etc.). For obligations that are not of an emergent nature, a make-up experiment time must be scheduled at least one week in advance of the laboratory period. In the case of emergency, you need to notify Dr. Slunt as soon as possible about the emergency. It is at the discretion of the instructor (with consultation of the chair) to schedule or allow any make-ups. **Unexcused absences from laboratory cannot be made up. MORE THAN ONE UNEXCUSED LABORATORY ABSENCE WILL RESULT IN FAILURE OF THE COURSE.**

It is also imperative that you be on time for the laboratory. The pre-lab lectures cover important safety and procedural information. If an individual is repeatedly tardy, a **five-point deduction** will occur for each instance or the student will not be permitted to perform the experiment.

It is absolutely critical that you respect the dangers inherent in laboratory space. **If I feel your behavior is seriously unsafe to either you or your classmates, you will be asked to leave immediately and will receive a zero for that day's effort.**

Be sure to bring the laboratory manual, scientific duplication notebook, a blue or black pen, and calculator to each experiment. You are required to have goggles and laboratory coats for each experiment. Failure to bring the appropriate materials to the laboratory may result in a penalty to your grade or may result in you being asked to leave and receiving a zero for that day.

**Grading:**

The grade in the course will be based on the following scale:

General assignments or writing targeted assignments	10%
Pre-laboratory assignments	15%
Post-laboratory assignments – could include data analysis, experimental exercises, and post-lab questions	35%
Lab report drafts	15%
Formal lab reports (including the Final Laboratory Report)	25%

A mid-semester report of unsatisfactory (U) will be reported if you have a C or below in the

course thus far.

Any student who fails to submit the final paper will automatically receive an “F” in the course.

The departmental policy for incomplete grades can be found on the chemistry department website, <http://cas.umw.edu/chemistry/academic-procedures/>.

### **Scientific Data Handling:**

Science laboratory courses can take one of two paths; 1) the class completes experiments that have a “correct” answer that the instructor knows and expects the students to obtain or 2) the class involves experiments similar to scientific research in which there is some uncertainty about the “correct” answer. In scientific research, individuals explore a problem and may have some idea about the answer but seek to gain new knowledge through exploration. In this course, you will be completing experiments that have a fairly expected outcome but you still need to treat the experiments like research experiments. Be careful when reporting your data and interpreting your findings that you report what you did and observed rather than what you expected to see or thought would happen. As such, a “wrong” answer in this course is one in which your explanations contradict the data obtained or do not logically explain the collected data. Scientific fraud occurs when individuals report what they expected or thought they would observe rather than what actually occurred.

Another ethical issue is to properly cite the sources of information. Properly cite all sources of information that you use in conducting an experiment (including all methods used) or interpreting the results. Use the American Chemical Society Style Guide as reference for the proper citation of sources.

### **Use of Commercial Homework Assistance Platforms and Artificial Intelligence (AI) technologies:**

You are prohibited from posting post-laboratory assignments to artificial intelligence or commercial homework assistance platforms (e.g., ChatGPT, Copilot, Chegg, Bartleby, Course hero) or receiving help from anyone not enrolled in the course, a writing center tutor, or Dr. Slunt. You may use AI platforms for brainstorming or to revise your written work but these tools should not be used to generate the responses to your assignments. You must indicate in a statement at the end of each assignment, if you used online tools and how you used them.

When using AI technologies, you should keep the following points in mind:

- AI is a continuously developing tool. Keep track of how you use AI (e.g., original and revised prompts, where in your thinking process you used AI, different output over time). An electronic file with screenshots and notes or a written journal of your process documents your workflow and, as needed, supports appropriate attribution and citation.
- Fact check all AI output. AI tools are built on systems and inputs with acknowledged biases. Early and current AI output has produced factual errors and the tools

'hallucinate' or fabricate information. This is especially true if the AI is prompted about something for which it has little or no information. Unless you know the answer with 100% certainty, check responses with trusted sources.

- AI is only as good as the prompts it receives. It may take practice and time to use AI for results meeting expectations and standards. As a result, AI may not be the best or easiest route for completing a task.

**Assignments:** Unless otherwise indicated in the assignment instructions, assignments can be typed using word processor or handwritten and can be submitted electronically on Canvas as pdf file or can be submitted on paper in-person. Notebook pages cannot be typed and must be handwritten in the duplication notebook.

1) General assignments or writing targeted assignments (i.e. introduction, safety, writing instruction assignments, peer reviews).

2) Pre-laboratory assignment – each experiment or exercise will have a pre-laboratory assignment. These will vary depending on the nature of the exercise and could involve one or more of the following:

- watching videos or reading sections of the laboratory manual or articles from the chemical literature
- answering pre-laboratory questions from the lab manual or posted on Canvas
- completing a pre-laboratory experimental planning and RAMP analysis worksheet

NOTE – if you do not turn in the notebook pre-laboratory assignment at the start of the laboratory period, you will not complete the lab and it will count as an unexcused absence.

For a multi-week experiment, you will submit pre-laboratory assignments **each week**.

3) Notebook pages for the experiment should follow the guidelines in the laboratory manual (chapter 1). You will turn copies of your notebook pages after completing the experiment and data analysis. You may either submit the duplication copies or submit an electronic copy through Canvas.

Your notebook pages should meet all of the guidelines in the laboratory manual and include the following:

- Date
- notes about any changes in the procedure completed
- information about chemicals and equipment used (e.g. manufacturer, model)
- data and observations
- calculations

4) Data analysis, bioinformatics or virtual laboratory (if applicable) exercises, and answers to post-laboratory questions laboratory manual. These assignments are designed to provide students with the opportunity to critically analyze experimental data, reflect on results, and connect findings to relevant scientific literature. These assignments require you to

evaluate the accuracy and reliability of your data, identify potential sources of error, and interpret results in the context of established scientific theories and concepts.

- 5) Formal laboratory report and lab report draft – for some multi-week experiments (indicated on the schedule), you will write a formal report for the experiment. After the first multi-week experiment, you will write an initial draft of the report. Once received, Dr. Slunt will review the submitted report and make suggestions for improvement. The following week, we will discuss how to incorporate feedback into final reports. Then you will incorporate the changes. The formal report should follow the templates for general use (not the one for rapid reports) posted on the *Biochemistry* journal website. All drafts and the final version of the report should be submitted through Canvas. For the final draft (revised manuscript) include a final copy with the changes made along with a “marked-up” copy that indicates the changes you made since the initial draft. The best way to show changes is to use “Track Changes” option in Microsoft word.
- 6) Final paper - A final formal laboratory report will serve as the final exam for this course. The paper will be due during final exam week and should incorporate the feedback from previous formal reports.

#### **Due Dates and Extensions:**

The course schedule lists all due dates. Any changes to this schedule and due date will be posted on Canvas. All assignments are due by 9:30 a.m. Late assignments will be accepted within 48-hours of the due date with a 10% deduction. After 48-hours, the assignment will not be accepted and will result in zero. Each student is allowed a one-week (no penalty) extension on **one** set of post-lab assignments provided that the student has submitted a written request for the extension. The extension does not apply to pre-lab assignments or the final paper. The week following the extension, the student is expected to complete both weeks' assignments. If the extension occurs during a multi-week experiment with a formal report, you will not receive feedback for the week of the extension.

#### **Honor System:**

Although you will be working as groups to complete the experiments, all assignments must be completed individually. Alteration of data or copying data from another individual is an honor offense. You may discuss how to do the calculations with other students or get help from the instructor, but your final report must be your own work. Properly cite all sources of information that you use in conducting an experiment (including all methods used) or interpreting the results. Use the American Chemical Society Style Guide as reference for the proper citation of sources.

You may not collaborate on the data analysis, pre-laboratory assignments, or notebook write-ups. Any assignment for which you will receive a grade must be completed individually and pledged as your own work. This includes notebook pages, laboratory reports, etc.

In accordance with the University's Honor Code, all work submitted for grading must be your own and be pledged as such by writing at the end of the work, "I hereby declare upon my word of honor that I have neither given nor received any unauthorized help on this work. (your signature)" It is your duty as students and ours as faculty to uphold the Honor Code, which is described in detail in the [Guidebook & Constitution](#). Suspected violations of the Honor Code will be addressed according to the policy established by the Honor Council.

**Disability Resources Statement:**

Students who require or feel they may require accommodations due to a disability should visit the Office of Disability Resources [online](#) for information about available resources. You will need to request appropriate accommodations through this office as soon as possible and then make an appointment to see your instructor to discuss your approved accommodation needs (you will need the letter issued you by the office at this meeting). If you have allergies to any chemicals or other emergency medical information, or have any other special needs, please notify your instructor ASAP.

**Title IX Compliance Statement:**

University of Mary Washington faculty are committed to supporting students and upholding the University's *Policy on Sexual and Gender Based Harassment and Other Forms of Interpersonal Violence*. Under Title IX and this Policy, discrimination based upon sex or gender is prohibited. If you experience an incident of sex or gender based discrimination, we encourage you to report it. ***While you may talk to your instructor, understand that as a "Responsible Employee" of the University, they must report to UMW's Title IX Coordinator what you share.*** If you wish to speak to someone confidentially, please contact the below confidential resources. They can connect you with support services and help you explore your options. You may also seek assistance from UMW's Title IX Coordinator. Please visit [the umw website](#) to view UMW's *Policy on Sexual and Gender Based Harassment and Other Forms of Interpersonal Violence* and to find further information on support and resources.

**Classroom Recording Statement:**

Classroom activities in this course may be recorded by students enrolled in the course for the personal, educational use of that student or for all students presently enrolled in the class only, and may not be further copied, distributed, published or otherwise used for any other purpose without the express written consent of the course instructor. All students are advised that classroom activities may be taped by students for this purpose. Distribution or sale of class recordings is prohibited without the written permission of the instructor and other students who are recorded. **Distribution without permission is a violation of copyright law.** This policy is consistent with UMW's [Policy on Recording Class and Distribution of Course Materials](#).

**Student Support on Campus:**

There are a number of supports on campus for students. If any of these apply to you, I encourage you to visit these centers on campus or contact the offices listed below. This list is not inclusive, if you have other needs and feel comfortable to speak with me about them, I will direct to the appropriate offices on campus.

**IT Help Desk:** If you are having difficulties with Canvas or connecting to online University resources, seek assistance from the Help Desk ([website](#), call 540-654-2255, or email [helpdesk@umw.edu](mailto:helpdesk@umw.edu)).

**Simpson Library:** The Simpson Library provides access to important physical and online resources and spaces. Copies of the textbook are available on reserve. Computers, printers, scanners, and study rooms are available for students, faculty, and staff. Research librarians are available to assist you via phone, email, chat, or face-to-face. Online databases, research guides, and e-books are accessible off-campus by using your network ID and password. An online interlibrary loan service is also available so that students can request books and articles not available at the Simpson Library. Contacts: [website](#) or 540-654-1148)

**Writing Center:** The Speaking and Writing Center, located in the Hurly Convergence Center 429, supports oral and written communication skills development through one-on-one or group consultations that address every stage of the composing process from brainstorming to final presentation and editing. UMW students can schedule 30- or 60-minute appointments, in-person or online, by visiting the [webpage](#). The Speaking and Writing Center adheres strictly to the Honor Code; consultants will not compose any portion of a paper or presentation for a student, nor will they do research for a student.

**Basic Needs Security:** Learning effectively and engaging wholly in class is dependent upon our basic security and having our fundamental needs met: having a safe place to sleep at night, regular access to nutritious food, and some assurance of safety. If you have difficulty affording groceries or accessing sufficient food to eat every day, or if you lack a safe and stable place to live, please contact Chris Porter, Assistant Dean of Students, at [cjporter@umw.edu](mailto:cjporter@umw.edu). Additionally, the Gwen Hale Resource Center is a free resource on campus, providing food, toiletries and clothing to any member of our community. The GHRC is located on the 5th floor of Lee Hall. Take the elevator closest to Monroe Hall to floor "A" (for attic). The GHRC is open any time Lee Hall is open during the school year. For access to the center outside of these hours, contact [resource@umw.edu](mailto:resource@umw.edu) or use the door code (967709). There is also a satellite site available in the Simpson Library. Finally, you are always welcome to talk with me about needs, if you are comfortable doing so. This will enable me to provide any resources I may possess

### **Tentative Laboratory Schedule:**

This schedule provides experiments or laboratory exercises. Assignments and due dates will be posted on Canvas. All assignments are due at 9:30 a.m. on the date listed, unless otherwise indicated. If the university is delayed or closed for inclement weather, classes may be held on Zoom or an alternative virtual laboratory assessment will be posted on Canvas. If changes are made, the updated syllabus and calendar will be posted on Canvas. You will be held accountable for the most recent version of the syllabus and calendar.

<b>Date</b>	<b>Experiment or Activity</b>	<b>Assignments Due</b>
1/16/25	Course Introduction, Laboratory Safety, and Introductory Writing Exercises	Prior to lab watch ACS safety videos In-lab period assignments (student introduction and syllabus review assignment)
1/23/25	Experiment 8 – Carbohydrate Identification	Safety Quiz Pre-lab assignment experiment 8
1/30/25	Writing Lab Report Sections and Ethical Considerations (AI, data handling) – virtual class meeting – Honors external review	Post-lab experiment 8 Reading assignment pre-lab
2/6/25	Experiment 22 – Separation and Identifications of Fatty Acids in Commercial Oils	Writing targeted assignments based on 1/30/25 exercise Pre-lab experiment 22
2/13/25	Experiment 20 – Isolation and Characterization of Myoglobin from Hamburger – Week 1	Post-lab experiment 22 Pre-lab assignment exp 20 week 1
2/20/25	Experiment 20 – Isolation and Characterization of Myoglobin from Hamburger – Week 2	Pre-lab assignment exp 20 week 2
2/27/25	Experiment 20 – Isolation and Characterization of Myoglobin from Hamburger – Week 3	Pre-lab assignment exp 20 week 3
3/6/25	<i>Spring Break – no lab meeting</i>	
3/13/25	Experiment 9 – NMR Spectroscopy of Biological Molecules	Pre-lab assignment exp 9 Formal lab report draft for exp 20
3/20/25	Using Lab Report Feedback – Peer Review and Instructor Feedback	Post-lab assignment exp 9
3/27/25	Experiment 16 – Salting Out Proteins or Fluorescence Protein Characterization – Experiments will involve Bioinformatics– Week 1	Pre-lab assignment exp 16 week 1 (or alternative exp) Final lab report for exp 20 – must use track changes
4/3/25	Experiment 16 – Salting Out Proteins or Fluorescence Protein Characterization – Week 2	Pre-lab assignment exp 16 week 2 (or alternative exp)
4/10/25	Experiment 21 – Tyrosinase Isolation – Week 1	Pre-lab assignment exp 21 week 1 Post-lab assignment exp 16
4/17/25	Experiment 21 – Tyrosinase Isolation – Week 2	Pre-lab assignment exp 21 week 2
4/24/25	Experiment 21 – Tyrosinase Isolation – Week 3	Pre-lab assignment exp 21 week 3
5/1/25	Final Exam Week – Final Laboratory Report due by 11 a.m.	Final Laboratory Report for experiment 21 Due by 11:00 a.m.