



Marshall University Syllabus College of Science

Course

Introductory Biochemistry Laboratory, CHM 366 Section 201

Course Description

Introduction to basic biochemistry laboratory techniques including chromatography, electrophoresis and enzyme kinetics; methods for identification and characterization of biochemical systems.

Credits

2.0 credit hours. Undergraduate.

Prerequisites

C or better in CHM 365

Term/Year

Spring, 2020

Class Meeting Days/Times

Wednesday 3:00pm – 4:50pm; Thursday 8:00am – 8:50am.

Location

492 Science Building

Academic Calendar

For beginning, ending, and add/drop dates, see the [Marshall University Academic Calendar](http://www.marshall.edu/academic-calendar/) (URL: <http://www.marshall.edu/academic-calendar/>).

Instructor

John F. Rakus, Ph.D.

Contact Information

- Office: 478 Science Building (lab, 480 Science Building)
- Office Hours (460 Science Building, Hoback Chemistry Library):
 - MWF: 10:30am – 11:30am
 - MTRF: 1:00pm – 2:00pm

- Also by appointment, walk in or email.
- Office Phone: 304-696-6627
- Marshall Email: rakus@marshall.edu

Required and/or Recommended Texts and Materials

Required Texts and Materials

None are required.

Classroom Expectations

This is a terminal laboratory course which is designed as an inquiry-guided research class. Your classroom experience will be determined by you. Though this is only a 2-credit hour course, it is rigorous; if you only intend to put effort into CHM 366 during the time we are in lab then you will likely do poorly. My expectation is that students arrive in class fully prepared, having read any and all pre-lab literature and be ready to immediately begin class activities. The nature of research often involves downtime. As adults, you are granted the privilege of using this time as you see fit; however I expect that students will spend their time in class focused on academic activities. I will not allow streaming of music/movies/sports events/TV shows/*etc.* in class during class time nor will I allow food or drink of any kind in the lab. Behavior that is a distraction to your classmates will be strongly discouraged. Our time in class together is meant to further your academic interests and development only.

Course Student Learning Outcomes

The table below shows the following relationships: How each student learning outcome will be practiced and assessed in the course.

Course student learning outcomes	How students will practice each outcome in this course	How student achievement of each outcome will be assessed in this course
Students will develop a direct understanding of the underlying theory and basic use of common biochemical laboratory techniques.	-In class lab activities -Blackboard quizzes -Lecture/discussion	-Blackboard quizzes -Lab reports -Lab presentations -Notebook
Students will be exposed to fundamental biochemical principles governing the behavior and properties of biological systems.	-In class lab activities -Blackboard quizzes -Class lectures	-Blackboard quizzes -Lab reports -Lab presentations

Course student learning outcomes	How students will practice each outcome in this course	How student achievement of each outcome will be assessed in this course
Students will design and execute original research projects.	-In class lab activities -Blackboard quizzes -Lecture/discussion	-Lab reports -Lab conduct -Lab presentations -Notebook
Students will present published and original research results.	-In class lab activities -In class presentations -Blackboard quizzes	-Lab reports -Lab presentations -Notebook

Course Requirements/Due Dates

January 15	Pretest	January 29	Blackboard Quiz 1	February 5	Intro Rough Draft
February 19	Revised Intro; Hypothesis Rough Draft	February 26	Blackboard Quiz 2	March 4	Revised Hypothesis
March 19	Methods Rough Draft	April 1	Blackboard Quiz 3	April 9	Results Rough Draft
April 15	Revised Methods	April 22	Revised Results Blackboard Quiz 4	April 23	Posttest
April 29	Final Report; Notebook	TBA	Final Presentation		

Capstone Policy

CHM 366 is designed to give students practical experience in basic biochemical laboratory techniques through original research projects. These projects are unique to CHM 366 and cannot be used to substitute for capstone or independent study credit. Students who take CHM 491 with Dr. Rakus must complete CHM 366 projects unrelated to their capstone studies. Students who have not yet selected a capstone advisor may have the opportunity to continue a CHM 366 project for their capstone.

Grading Policy

All written assignments will be graded on a +/- letter-grade basis. The letter grade will be recorded as a range. An example is: B+ (87-89), B (83-86), B- (80-82). Your conduct in class as well as a final evaluation of your written work will determine how the range will be used to determine the final course grade.

<p>All assignments are due by the start of class on their respective due dates. Tardiness is defined as one minute past the start of class and will result in a 10% reduction on the grade for that specific assignment. Continued tardiness on an assignment will result in an additional 10% reduction for every 24 hours past the due date.</p>		
<p>Pre and Post Tests (5%)</p>	<p>Due to our class's involvement in the Malate Dehydrogenase CURES Community (MCC) project, certain assessment data is required. This is why it is necessary for you to complete the IRB consent form. For CHM 366, you are graded only on completion of these assignments, not on your performance. You get full credit simply for doing both them.</p>	
<p>Blackboard Quizzes (15%)</p>	<p>There will be four quizzes on the course Blackboard site (see Course Requirements/Due Dates). Your grade will be determined by the average on all of these quizzes after your highest score has been weighted twice compared to your remaining scores. These are meant to be review of key concepts pertinent directly to our work in CHM 366. You are allowed to work in groups and consult other sources for assistance, but evidence of plagiarism will not be tolerated.</p>	
<p>Notebook (15%)</p>	<p>Keeping a thorough, accurate scientific notebook is essential when conducting research. Your notebook will be graded at the completion of the semester. There will be two dates for ungraded progress evaluations. A rubric will be made available for further details.</p>	
<p>Lab Conduct (10%)</p>	<p>See Classroom Expectations for further details. Your behavior in lab must be completely professional. Criteria that are under evaluation include, but are not limited to: punctuality, proper lab attire, lab cleanliness, interpersonal behavior, safe lab practices, <i>etc.</i> I will try to provide warnings and explanations before docking this grade, but egregious violations may omit such warnings.</p>	
<p>Writing Assignments (45% Total)</p>	<p>We will be writing a comprehensive report for our project this semester. 45% of your overall grade will be based on this report. We will work on sections of the report throughout the semester (see Tentative Course Schedule) and you will have the opportunity to edit a draft of each section in order to improve it. The specific grading breakdown of each section is as described below.</p>	
	<p>Introduction and Literature Review (5%)</p>	<p>2.5% (rough draft, Feb 5) 2.5% (revised draft, Feb 19)</p>
	<p>Hypothesis and Proposal (10%)</p>	<p>7.0% (rough draft Feb, 19) 3.0% (revised draft, Mar 4)</p>
	<p>Materials and Methods (5%)</p>	<p>3.0% (rough draft, Mar 19) 2.0% (revised draft, Apr 15)</p>
	<p>Results and Discussion (10%)</p>	<p>5.0% (rough draft, Apr 9) 5.0% (revised draft, Apr 22)</p>
	<p>Final Report (15%)</p>	

Final Presentation (10%)	For your final assignment your group will present a poster on the work you have done this semester. It can be at either the College of Science or Department of Chemistry poster sessions (Date: TBA) at the end of the semester.
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Attendance/Participation Policy

Attendance for CHM 366 is mandatory. Each non-excused absence will result in a 5% (one-half letter grade) deduction from your overall grade. All excused absences must be documented and made up as soon as possible.

University Policies

By enrolling in this course, you agree to the University Policies. Please read the full text of each policy (listed below) by going to [MU Academic Affairs: University Policies](http://www.marshall.edu/academic-affairs/policies/). (URL: <http://www.marshall.edu/academic-affairs/policies/>)

- Academic Dishonesty Policy
- Academic Dismissal Policy
- Academic Forgiveness Policy
- Academic Probation and Suspension Policy
- Affirmative Action Policy
- Dead Week Policy
- D/F Repeat Rule
- Excused Absence Policy for Undergraduates
- Inclement Weather Policy
- Sexual Harassment Policy
- Students with Disabilities (Policies and Procedures)
- University Computing Services Acceptable Use Policy

Students with Disabilities

For University policies and the procedures for obtaining services, please go to [MU Academic Affairs: University Policies](http://www.marshall.edu/academic-affairs/policies/) and read the section, **Students with Disabilities**. (URL: <http://www.marshall.edu/academic-affairs/policies/>)

Marshall University E-Mail Accounts

You must have and use your MU email account. Your personal email accounts will not be used for official communication with Marshall University programs and personnel. You may redirect your MU email to your own personal email account, but you must sign in to your MU account to do that. Marshall University uses Office 365 email. For more information, visit [Marshall IT: Office 365](https://www.marshall.edu/it/office365/) (URL <https://www.marshall.edu/it/office365/>).

Tentative Course Schedule

Class Dates	Lab Activities	Assignments	Other
Jan 15 & 16	Introductions, pretest and background.	Jan 15 – pretest	
Jan 22 & 23	MDH lecture and literature review. Writing a hypothesis.		Jan 21 – W period begins
Jan 29 & 30	Biochemistry lab skills. Writing development.	Jan 29 – Blackboard Quiz 1	
Feb 5 & 6	MDH: Protein Purification	Feb 5 – Intro Rough Draft	
Feb 12 & 13	MDH: Enzyme Kinetics		
Feb 19 & 20	MDH: Bioinformatics	Feb 19 – Intro Revised Draft Hypothesis Rough Draft	
Feb 26 & 27	MDH: Individual Experiments	Feb 26 – Blackboard Quiz 2	
Mar 4 & 5	MDH: Individual Experiments	Mar 4 – Hypothesis Revised Draft	
Mar 11 & 12	MDH: Individual Experiments		
Mar 18 & 19	MDH: Individual Experiments	Mar 19 – Methods Rough Draft	Mar 20 – W period ends
Mar 25 & 26	NO CLASS: Spring Break		
Apr 1 & 2	MDH: Individual Experiments	Apr 1 – Blackboard Quiz 3	
Apr 8 & 9	MDH: Individual Experiments	Apr 9 – Results Rough Draft	
Apr 15 & 16	MDH: Individual Experiments	Apr 15 – Methods Revised Draft	
Apr 22 & 23	MDH: Individual Experiments	Apr 22 – Blackboard Quiz 4 Results Revised Draft Apr 23 – Posttest	
Apr 29	FINALS WEEK	Apr 29 – Final report due Notebook	TBA: Final Presentation

Technology and Technical Skill Requirements

[Enter requirements such as the example below. Edit as needed and delete anything that is not required.]

- Students must be proficient in the use of computers, the Internet, browsers, Microsoft Office Word, and other common applications.
- For computer and browser requirements, see “Get Connected” and “Internet Browser” at [Student Resources: First Steps](http://www.marshall.edu/muonline/student-resources/). See also [IT: Recommended Hardware](http://www.marshall.edu/it/recommendations/) (URLs: <http://www.marshall.edu/muonline/student-resources/> and <http://www.marshall.edu/it/recommendations/>).
- To check your browsers, use the [Blackboard Browser Checker](https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support/Browser_Checker) and ensure that you set permissions properly and have all the necessary plug-ins. (URL: https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support/Browser_Checker)
- Students must be able to use Marshall email, as well as the following tools in Blackboard: course messages, assignments, discussion board forums, tests, blogs, journals, wikis, and groups. Links to Blackboard Help and tutorials are available on the Start Here page and on the Tech Support tab in Blackboard.
- [Adobe Acrobat Reader](https://get.adobe.com/reader/) may be needed to read some files. This plug-in is available free. (URL: <https://get.adobe.com/reader/>) See the Tech Support tab in Blackboard for additional information and links.
- Students may be required to submit assignments as Microsoft Word documents (.docx), using the most recent Microsoft Office suite. Office 365 is available at no extra charge to students enrolled at MU. For information visit [Marshall IT: Office 365](http://www.marshall.edu/it/office365/) (URL: <http://www.marshall.edu/it/office365/>).
- See the Tech Support tab in Blackboard for additional information on browsers, technology, and apps.

Technology Assistance

If you have technical problems, please contact one or more of the following:

- [Blackboard Support Center](http://marshall.edusupportcenter.com) (URL: <http://marshall.edusupportcenter.com>)
- Marshall [Information Technology \(IT\) Service Desk](http://www.marshall.edu/it/departments/it-service-desk/) (Help Desk) (URL: <http://www.marshall.edu/it/departments/it-service-desk/>)
 - Huntington: (304) 696-3200
 - South Charleston: (304) 746-1969
 - [Email the IT Service Desk](mailto:itservicedesk@marshall.edu) (itservicedesk@marshall.edu)