

## BMB 370 – Introductory Biochemistry Lab

### Course format

Credit hours: 3

Course modality: In person

*Lecture:* Monday, 8:00–8:50 am, BPS room 1410

*Laboratory:* Tuesday (section 001), Wednesday (section 002), and Thursday (section 003), 9:10–12:00 am, Biochemistry 113 and 117

*Recitation:* Friday, 12:40–1:30 pm BPS room 1410

Lecture, Lab, and Recitation are all mandatory parts of the course

### Course website address

<https://d2l.msu.edu/d2l/home/2069099>

<https://d2l.msu.edu/d2l/home/2069105>

<https://d2l.msu.edu/d2l/home/2069103>

<https://d2l.msu.edu/d2l/home/2069101>

### Instructors

Dr. Sean Weise

[weisesea@msu.edu](mailto:weisesea@msu.edu)

Dr. Melanie Balbach

[balbachm@msu.edu](mailto:balbachm@msu.edu)

Dr. Erich Grotewold

[grotewol@msu.edu](mailto:grotewol@msu.edu)

### Teaching assistants

Alex Jutila

[jutilaal@msu.edu](mailto:jutilaal@msu.edu)

Mia Bricker

[bricke18@msu.edu](mailto:bricke18@msu.edu)

Kai Ching Hsiao

[hsiaoka2@msu.edu](mailto:hsiaoka2@msu.edu)

### Office hours:

Dr. Weise	Mon – Thurs 1pm – 4pm, Biochemistry Rm 105B
Dr. Balbach	Wed & Thu 2:30 – 4 pm, Biochemistry Rm 402D (please e-mail before)
Dr. Grotewold	Tue & Wed 2:30 – 4 pm, Biochemistry Rm 310A (please e-mail before)

**Course Description:** BMB 370 provides an introduction to biochemical and molecular concepts, techniques, and data analysis tools commonly used in basic research and in industrial labs. Weekly lectures introduce students to the concepts and methods involved in the corresponding lab period. Weekly lab periods familiarize students with basic biochemistry techniques using experiments with proteins, and nucleic acids. These experiments and their analysis provide a foundation for all biochemistry students but particular to those who want to join research labs and apply for internships. Weekly recitations cover experimental learning outcomes, data analysis, and general Q&A.

### Required Course Materials and technology:

- Students must supply protective eye wear (safety glasses)
- No shorts, sandals, or open-toed shoes are allowed in the laboratory
- Laptop computer and smart phone will be required in lab each week
- Because of the need for Microsoft Office apps as well as SnapGene Viewer software, a PC or Mac is required. Chromebooks will not work.
- Basic scientific calculator, the Texas Instruments TI-30Xa is recommended. A more complicated graphing calculator is often a hindrance
- Standalone (**not web browser-based**) Microsoft Office apps Excel, Word, and PowerPoint. Instructions for downloading these apps for free can be found here: <https://tech.msu.edu/technology/hardware-software/microsoft-licenses/#undergrad>

### **Grading Policies**

Class performance will be evaluated through weekly lab notebooks, weekly D2L homework, two in-class lab practical exams and one final written exam.

#### **Grades in BMB 370**

Notebooks	50%
Two practical exams	12.5% each
D2L homework	10%
Final written exam	15%
<b>Total</b>	<b>100%</b>

#### **Grading Scale**

<b>%</b>	<b>Grade</b>
≥ 89.50	4.0
≥ 84.50	3.5
≥ 79.50	3.0
≥ 74.50	2.5
≥ 69.50	2.0
≥ 64.50	1.5
≥ 59.50	1.0
< 59.50	0

Lecture, lab, and recitation are all mandatory. Attendance will be recorded. Three lab absences (excused or unexcused) will result in an automatic 0 for the course.

- Two points in each lab notebook grade are given for arriving to lab on time, having filled the required tables in the lab instructions ahead of time, and being ready to start the lab promptly at 9:10 am.
- Unless stated otherwise, lab notebooks are due at 8:30 am the day of a student's lab section. Submission at 8:35 am that day is considered one day late.
- The late penalty for notebooks is 10% of the points for the assignment per day (including weekends) up to a maximum of 50% off. There will be no extensions of lab notebook due dates. Lab notebooks turned in late due to last minute computer problems, unanticipated illness, or other life events will be graded as late. Do not leave lab notebook completion to the last minute.
- Except for excused absences, lab notebook grades will be decreased by 25% for arriving to the lab 1 hour late and by 50% for arriving 2 or more hours late.
- Lab notebooks for unexcused lab absences can be turned in for 50% credit using data from a lab partner or from Dr. Weise. It is the student's responsibility to contact Dr. Weise regarding absences and to request data.
- Lab notebooks for unexcused lab absences are still due at the original time. An additional 10% will be deducted for each day late.
- Late notebook submissions will not be graded if submitted later than one week after the deadline. The last two lab notebooks of the semester will not be accepted later than 8:30 am on the Tuesday of final exam week.
- There will be no extensions of homework due dates.
- Students must provide adequate documentation to the instructor preferably before, but no later than 48 hours after the absence for an absence to be excused. It is the student's responsibility to contact Dr. Weise regarding excusable absences. Absences will not be excused retroactively. Excusable absences include academic absences (e.g., conference attendance), attending a funeral, or illness. In the case of medical absences students are welcomed and encouraged to redact as much information from the "doctor's note" as they would like, that still conveys the evidence of illness during the time period that prevented attendance. Weddings and leisure/family travel do not constitute excusable absences.
- Make-up labs will be offered for excused absences only. All make-up labs must be completed within one week of the missed lab. A missed make-up lab will default to the unexcused absence policy of 50% credit using data provided by Dr. Weise and will be due at the original date with an additional 10% off for each day late.

- It is the responsibility of students with RCPD accommodation letters, to present these to the instructors during the first week of the semester, or as soon as the accommodation is granted (even if you do not intend to use the accommodation). RCPD accommodations will not be granted retroactively.

### **Challenging Grades**

From the time an assignment's grade is posted, students have **1 week to challenge their grade** by contacting Dr. Weise, **not the TA**. This is best done during Dr. Weise's office hours. Grading challenges will not be considered during class or lab time. Grading challenges will not be considered after 5 pm on the Friday of finals week regardless of when the grade was posted.

### **Strategies to succeed in the course**

- Attending lectures, labs, and recitations is mandatory. You will be expected to know anything said during class or lab time. **Take notes.**
- If you miss a class or a lab, get notes from another student and contact Dr. Weise for data to submit a lab notebook. 50% credit is better than a 0.
- If you missed a lab that will be covered on the first or second lab practical, contact Dr. Weise to arrange a time to familiarize yourself with the lab protocol covered.
- Complete the required tables and familiarize yourself with the protocol before coming to lab.
- Download and use the Lab Companion posted on D2L to help solve homework and lab problems. Understand what you are doing, do not blindly follow formulas.
- Do not rely on Chegg or other students' answers for homework. It defeats the learning process and does not prepare you for the exams and for working in a research lab.
- Be an active participant in the lab. Do not let your lab partner do all the work. If you do, you will not be prepared for the practical and final exams.
- Read the homework feedback posted weekly on D2L to better learn how to set up calculations correctly.
- Use the lab notebook template posted on D2L and follow the directions in the lab instructions to complete your notebooks. Turn in lab notebooks on time.
- Lab notebooks should be submitted in **PDF format** to prevent formatting errors by D2L.
- After posting your lab notebook on D2L, double-check that you turned in the correct lab notebook, that all calculations, tables, graphs, figures, and conclusions are included, and that your document is formatted correctly. You can always resubmit the correct notebook.
- Read the weekly feedback on graded lab notebooks to understand what you did incorrectly so you can improve in your next submissions.
- **ASK QUESTIONS** during/immediately after lectures, during office hours, during appointments outside of office hours, during the lab periods, and during recitations.
- Be proactive and do not wait until after the second exam to seek help on how to improve your grade. We are here to help you. Make use of office hours.

While most lab work is done in pairs, students are expected to do their own work on lab notebook submissions. Duplicated lab notebooks, whole or in part, will result in a 0 for that lab notebook for all students involved. A second incidence will result in a 0 for the course and reporting to the university. Cheating on exams will result in a 0 for that exam and reporting to the university. Students are expected to develop original work for this course. (See also <http://www.msu.edu/unit/ombud/dishonestyFAQ.html>).

### **Honors option**

It is the responsibility of students interested in an honors option to contact Dr. Weise before the end of the third week of classes. Honors options will not be granted after the end of the third week of class. Honors projects must be completed and reports submitted before the Monday of the last week of class, not the Monday of finals week.

### **Student Integrity and Academic Honesty**

Article 2.3.3 of the Academic Freedom Report states that “The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards.” In addition, the BMB Department adheres to the policies on academic honesty as specified in General Student Regulations 1.0, Protection of Scholarship and Grades; the all-University Policy on Integrity of Scholarship and Grades; and Ordinance 17.00, Examinations. (See Spartan Life: Student Handbook and Resource Guide and/or the MSU Web site: [www.msu.edu](http://www.msu.edu).)

### **Diversity, Equity, and Inclusion Policy**

Inclusion and diversity are core values of MSU, the College of Natural Science, and the Department of Biochemistry & Molecular Biology. Drs. Grotewold, Balbach, and Weise are committed to creating and maintaining an inclusive classroom in which students can work together in an atmosphere free from all forms of discrimination and harassment. Along with the expectations for coursework, we expect that we will all treat each other with respect and collegiality, and that we will be open to conversations and perspectives that challenge our own perspectives.

All people have the right to be addressed and referred to in accordance with their personal identity. Students should please let us know if they would like to use a name or pronouns different from those used for you by the University.

### **Mandatory Reporting Policy**

As professors, one of our responsibilities is to help create a safe learning environment for our students and for the campus as a whole. As members of the university community, we are required to report any instances of sexual harassment, sexual violence and/or other forms of prohibited discrimination. If a student has a need to report about any such event(s), but would rather share information with a confidential employee who does not have this reporting responsibility, a list of those individuals can be found here <https://caps.msu.edu/>.

### **Policy on religious observance**

It is the policy of MSU to permit students to observe holidays set aside by their chosen religious faith. If a student needs to be absent from class on a religious holiday, please make arrangements with instructors in advance.

### **Grief Policy**

Please read the Grief Absence Policy at <https://reg.msu.edu/ROInfo/Notices/GriefAbsence.aspx>. Instructors will do their best to provide students with a timeline for completing homeworks and group worksheets compatible with students' absence.

Syllabus FS24 BMB 370 – Introductory Biochemistry Lab

**Course schedule**

Day	Event	Person	Subject	Lab Notebook due at 8:30am Homework due at 11:59pm
Mon Aug 26	First Lecture	Dr. Weise	Volumetric Devices	
Tues - Thurs	First Lab	Dr. Weise		
Fri Aug 30	Second Lecture	Dr. Weise	pH and pKa	Homework 1
Mon Sept 2	Labor Day	University Closed		
Tues-Thurs	Second Lab	Dr. Weise		Volumetric Devices
Fri Sept 6	Recitation	Dr. Weise		Homework 2
Mon Sept 9	Third Lecture	Dr. Weise	Dilutions & Spec Intro	
Tues-Thurs	Third Lab	Dr. Weise		pH and pKa
Fri Sept 13	Recitation	Dr. Weise		Homework 3
Mon Sept 16	Review for Exam	Dr. Weise	First Practical Exam	
Tues-Thurs	First Practical Exam	Dr. Weise		Dilutions & Spec Intro
Fri Sept 20	Review of Practical Exam	Dr. Weise		
Mon Sept 23	Fourth Lecture	Dr. Balbach	Protein Assays	
Tues-Thurs	Fourth Lab	Dr. Weise		
Fri Sept 27	Recitation	Dr. Weise		Homework 4
Mon Sept 30	Fifth Lecture	Dr. Balbach	Enzyme Assays	
Tues-Thurs	Fifth Lab	Dr. Weise		Protein Assays
Fri Oct 4	Recitation	Dr. Weise		Homework 5
Mon Oct 7	Sixth Lecture	Dr. Balbach	Tagged Protein Purification	
Tues-Thurs	Sixth Lab	Dr. Weise		Enzyme Assays
Fri Oct 11	Recitation	Dr. Weise		Homework 6
Mon Oct 14	Review for Exam	Dr. Balbach	Second Practical Exam	
Tues-Thurs	Second Practical Exam	Dr. Weise		Tagged Protein Purification
Fri Oct 18	Seventh Lecture	Dr. Balbach	SDS-PAGE	
Mon-Tues Oct 21-22	Fall Break	University Closed		
Wed-Thurs	Seventh Lab	Dr. Weise		
Fri Oct 25	Recitation	Dr. Weise		Homework 7
Mon Oct 28	Eighth Lecture	TBD	Carbohydrate Assays	
Tues-Thurs	Eighth Lab	Dr. Weise		SDS-PAGE sections 2 & 3
Fri Nov 1	Recitation	Dr. Weise		Homework 8
Mon Nov 4	Ninth Lecture	Dr. Grotewold	Plasmid Prep	
Tues-Thurs	Ninth Lab	Dr. Weise		Carbohydrate Assays
Fri Nov 8	Recitation	Dr. Weise		Homework 9
Mon Nov 11	Tenth Lecture	Dr. Grotewold	Restriction Enzymes	
Tues-Thurs	Tenth Lab	Dr. Weise		Plasmid Prep
Fri Nov 15	Recitation	Dr. Weise		Homework 10
Mon Nov 18	Eleventh Lecture	Dr. Grotewold	CRISPER-Cas9	
Tues-Thurs	Eleventh Lab	Dr. Weise		Restriction Enzymes
Fri Nov 22	Recitation	Dr. Weise		Homework 11
Mon Nov 25	Twelfth Lecture	Dr. Grotewold	PCR	
Tues	SDS PAGE Lab Sec 2	Dr. Weise		CRISPER-Cas9
Wed	Open Lab	Dr. Weise		CRISPER-Cas9
Thurs-Fri Nov 28-29	Thanksgiving Break	University Closed		CRISPER-Cas9
Mon Dec 2	Review for Final Exam	Dr. Grotewold		
Tues-Thurs	Twelfth Lab	Dr. Weise		
Fri Dec 6	Recitation	Dr. Weise		Homework 12
Mon Dec 9	Final Exam	Dr. Weise	7:45am 1410 BPS	
Tues Dec 10				PCR Notebook for all sections