

## 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

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

Attendance to lectures and lab is mandatory

### Course website address

<https://d2l.msu.edu/d2l/home/2146411>

<https://d2l.msu.edu/d2l/home/2146417>

<https://d2l.msu.edu/d2l/home/2146415>

<https://d2l.msu.edu/d2l/home/2146413>

### Instructors

Dr. Sean Weise

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Dr. Melane Balbach

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Dr. Erich Grotewold

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### Teaching assistants

Bryce Delaney

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Brayden Krah

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### Office hours:

Dr. Weise	Mon 1pm – 4pm, Tues – Thurs 2-4pm Biochemistry Rm 105B
Dr. Balbach	Mon 2 – 3 pm, Biochemistry 402A
Dr. Grotewold	Mon 1 – 2 pm, Biochemistry 310A

**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 (not chromebook) 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 and one final written exam.

**Grades in BMB 370**

Notebooks	45%
D2L homework	5%
2 practical exams	16.7% each
Final written exam	16.7%
<b>Total</b>	<b>100%</b>

**Grading Scale**

%	Grade
≥ 89.5	4.0
≥ 84.5	3.5
≥ 79.5	3.0
≥ 74.5	2.5
≥ 69.5	2.0
≥ 64.5	1.5
≥ 59.5	1.0
< 59.5	0

exams

Lecture, lab, and lab lecture are all mandatory. Attendance will be recorded.

**Lab and Exam Attendance Policies**

- No more than two excused absences are allowed. After this an absence will be considered an unexcused absence.
- No more than two unexcused absences are allowed. The third unexcused absence will result in a 0 for the course.
- The maximum number of absences allowed is 2 excused absences and 2 unexcused absences. A fifth absence will result in a 0 for the course.
- 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 (after 48 hr). 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. Participation in sports (MSU or other), weddings, and leisure/family travel or family obligations do not constitute excusable absences.
- For an absence to be excused for a funeral a grief absence must be obtained from the College of Natural Science. <https://natsci.msu.edu/undergraduate/current-students/undergraduate-academic-student-affairs/index.aspx>
- Make-up labs and exams will be offered for excused absences only. All make-up labs and exams 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. A missed make-up exam will result in a 0 for that exam.
- Lab notebooks for the first absence (excused or unexcused) can be turned in by the original due date for 100% credit using data provided by Dr. Weise. It is the responsibility of the student to contact Dr. Weise to request data.
- Lab notebooks for excused absences can be turned in for 100% credit. Except under unusual circumstance the lab notebook will still be due by the original due date and time.
- Lab notebooks for unexcused absences can be turned in by the original due date and time for 50% credit using data provided by Dr. Weise. It is the responsibility of the student to contact Dr. Weise to request data.
- There are no make-ups for unexcused exam absences. An unexcused exam absence will result in a 0 for that exam.

### **Lab Notebook and Homework Policies**

- 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 8:31 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.
- 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.
- 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 or lab notebook due dates.

### **Cheating and Academic Dishonesty Policies**

- 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 of cheating will result in a 0 for the course and reporting to the university.
- AI may be used to assist in the understanding of material for the completion of lab notebooks. This is viewed no differently then conducting a web serch for information.
- Direct answers to lab notebook questions, calculations, graphs, or figures generated by AI may not be submitted (cited or uncited) in lab notebooks or exams. This is considered plagurizim and defeats the learning process.
- Work generated by AI will result in a 0 for that lab notebook. 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.
- Leaving the exam room prior to the submission of the exam without the consent of the instructor may constitue cheating and result in a 0 for the exam
- Students are expected to develop original work for this course. (See also <http://www.msu.edu/unit/ombud/dishonestyFAQ.html>).
- Falsefied documentation for an absence will result in a 0 for the lab notebook or exam involved and reporting to the university.

### **RCPD Accomodation**

- 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**

- Attendance to lectures (Mon and Fri) and lab is mandatory. Attendance will be monitored. You will be expected to know everything mentioned 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 you missed.
- 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 online answers or other students' answers for homework. It defeats the learning process, does not prepare you for the exams, or 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 answer keys posted weekly on D2L to better learn how to set up calculations correctly. The homework answer keys are also a great way to study.
- 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 corrected notebook if a mistake is found. A notebook can be resubmitted after the due date, but it will be subject to the 10% per day penalty.
- 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. By this point it is difficult to improve your grade. We are here to help you. Make use of office hours.

### **Honors option**

An honors option will not be offered for the fall 2025 semester.

### **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. The instructors of BMB370 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.

Please let us know if you would like to use a name or pronouns different from those used for you by the University and we will accommodate you by using your first name and/or pronouns.

### **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 any such event(s), but would rather share information confidentially with an 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 labs compatible with students' absence.

## Course Schedule

Day	Event	Person	Homework due Tues at 11:59pm, Lab Notebook due at 8:30am the day of lab
Mon Aug 25	Pipetting and pH Lecture	Dr. Weise	
Tues - Thurs	Pipetting and pH Lab	Dr. Weise	Pipetting and pH Homework
Fri Aug 29	Dilutions & Spec Lecture	Dr. Weise	
Mon Sept 1	Labor Day		
Tues-Thurs	Dilutions and Spec Lab	Dr. Weise	Dilutions and Spec Homework Pipetting and pH Lab Notebook
Fri Sept 5	Lab Lecture Dilutions and Spec	Dr. Weise	
Mon Sept 8	ELISA Lecture	Dr. Balbach	
Tues-Thurs	ELISA Lab	Dr. Weise	ELISA Homework Dilutions and Spec Lab Notebook
Fri Sept 12	ELISA Lab Lecture	Dr. Balbach	
Mon Sept 15	Review for Exam 1	Dr. Weise	
Tues-Thurs	Practical Exam 1	Dr. Weise	ELISA Lab Notebook
Fri Sept 19	Review of Practical Exam 1	Dr. Weise	
Mon Sept 22	Protein Assays Lecture	Dr. Balbach	
Tues-Thurs	Protein Assay Lab	Dr. Weise	Protein Assays Homework
Fri Sept 26	Protein Assay Lab Lecture	Dr. Weise	
Mon Sept 29	Enzyme Assay Lecture	Dr. Balbach	
Tues-Thurs	Enzyme Assay Lab	Dr. Weise	Enzyme Assay Homework Protein Assay Lab Notebook
Fri Oct 3	Enzyme Assay Lab Lecture	Dr. Weise	
Mon Oct 6	Carbohydrate Assay Lecture	Dr. Balbach	
Tues-Thurs	Carbohydrate Assay Lab	Dr. Weise	Carbohydrate Assay Homework Enzyme Assay Lab Notebook
Fri Oct 10	Carbohydrate Assay Lab Lecture	Dr. Weise	
Mon Oct 13	Review for Exam 2	Dr. Weise	
Tues-Thurs	Second Practical Exam	Dr. Weise	Carbohydrate Assay Lab Notebook
Fri Oct 17	Review of Practical Exam 2	Dr. Weise	
Mon Oct 20	Fall Break		
Wed-Thus	Catch Up / Review Labs	Dr. Weise	
Fri Oct 24	No lecture		
Mon Oct 27	Lecture Plasmid Prep & Transformation	Dr. Weise	
Tues-Thurs	Plasmid Prep & Transformation Lab	Dr. Weise	Plasmid Prep Lab Homework
Fri Oct 31	Lecture CRISPR Overview	Dr. Balbach	
Mon Nov 3	PCR & DNA Gel	Dr. Balbach	
Tues-Thurs	Screening and PCR Lab	Dr. Weise	PCR Homework Plasmid Prep Lab Notebook
Fri Nov 7	Screening and PCR Lab Lecture	Dr. Weise	
Mon Nov 10	DNA Gel & HDR Lecture	Dr. Balbach	
Tues-Thurs	DNA Gel Lab	Dr. Weise	DNA Gel Homework Screening Lab Notebook
Fri Nov 14	DNA Gel Lab Lecture	Dr. Weise	
Mon Nov 17	Protein Purification Lecture	Dr. Balbach	
Tues-Thurs	Protein Purification Lab	Dr. Weise	Protein Purification Homework DNA Gel Lab Notebook
Fri Apr 18	Protein Purification Lab Lecture	Dr. Weise	
Mon Nov 24	Protein Purification Review	Dr. Grotewold	
Tue	Catch Up / Review Labs	Dr. Weise	Protein Purification Lab Notebook
Fri Apr 28	Thanksgiving Break		
Mon Dec 1	SDS-PAGE Lecture	Dr. Grotewold	
Tues - Thurs	SDS-PAGE Lab	Dr. Weise	SDS-PAGE Homework SDS-PAGE Notebook Due Fri 11:59 pm
Fri Dec 5	SDS-PAGE Lab Lecture	Dr. Weise	
Mon Dec 8	Final Exam 7:45am	Dr. Weise	