



Syllabus and Course Info

Biocore 486: Principles of Physiology Lab

Course Designation and Attributes:

Biocore 486 is a 2-credit Honors intermediate level lab course.

Canvas Course URL: <https://canvas.wisc.edu/courses/308854>

Course description:

Students experience the process of science by collaborating on two multi-week independent experiments to investigate their own questions about animal and plant physiology. Emphasis is on critical thinking required in designing and conducting experiments, analyzing and interpreting data, and communicating findings orally and in writing.

Requisites: Biocore 485 or concurrent enrollment

Class Meeting Location: All Discussion sections and labs meet in 355 Noland Hall

Instructional Modality: This is an in-person, synchronous course with weekly 3h lab meetings led by the course chair Dr. Anna Kowalkowski. Discussion sections are required and will meet in-person, once weekly for 50 min led by your teaching assistants.

Required Resources

1. Biocore 486 [Custom Lab Manual 2022](#) - available on Canvas.
2. Biocore Writing Manual - Janet Batzli and Michelle Harris editors available as the [Process of Science Book 1: Science Communication](#) on Canvas and online through Pressbooks.
3. Biocore Statistics Primer- Michelle Harris, Rick Nordheim and Janet Batzli editors available as the [Process of Science Book 3: Data Analysis, Statistics, and Experimental Design](#) on Canvas and online through Pressbooks.
4. Computer resources - We will be using Canvas course website for instructional resources and access to and submitting assignments. Therefore, you will need reliable internet access and a computer or tablet with a working camera and microphone. The University has prepared [some suggestions](#) regarding what you will need to get started.

Credit and Instruction:

Biocore 486 is a 2-credit Honors laboratory course that includes a 3-hour in-class lab time led by Dr. Anna Kowalkowski, and a required 50-minute discussion section led by your graduate TA. You should plan to spend a minimum of 6 hours outside of regular class hours each week to do lab readings, work on literature

searches, project development, some data collection, data analysis, PowerPoint and poster preparation, paper writing, and peer review. Credit for this course counts towards Biological Science (which also meets the Natural Science) breadth requirements, and Honors credit that can be applied towards Honors in an array of majors. See below and the course schedule on Canvas for more information about expectations for student work.

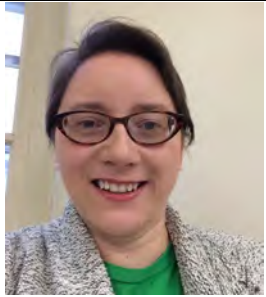
Regular and Substantive Student-Instructor Interaction






We are delighted to have you join our Biocore 486 learning community, and we are eager to support your learning!

As the course chair, Anna is available by appointment to talk about the course, the Biocore program more generally or other academic work, and your undergraduate experience more generally. In addition, Anna will hold office hours during particularly busy weeks for consultation on lab projects, writing, data analysis and interpretation. Seth McGee, Biocore Lab Manager, will be available to support your development of projects and provide essential feedback as you gather materials, schedule experiments, learn techniques, and collect data. Graduate TAs will assist you during lab, facilitate discussion sections, send out timely information in weekly emails, and will grade and provide feedback on your written and oral presentation work. Our course instructional team also includes four undergraduate TAs (one-two for each lab section) who will provide extra support to you by providing feedback during lab and discussion time, in peer reviewing papers and in practicing oral presentations.

During lab and discussion section, you will work together with your research team and the instructors to develop and carry out your research projects, communicate your research via presentations, do peer review, consult with instructors on experimental design and data analysis, and do statistics workshops and other activities that enhance your knowledge of the process of science.

We recognize your prior experience and build upon it as you deepen your understanding of the process of science and use it to investigate your own questions. We have a very dedicated teaching team assembled to help support your learning (see our contact information above). Perhaps most importantly, you are surrounded by amazing peers that will significantly and positively influence your development as a scientist and collaborator.

Instructors	
All instructors welcome student emails and hold office hours as listed or by appointment	
Dr. Anna Kowalkowski (Course Chair) 307 Noland Hall, akowalkowski@wisc.edu <i>Make an appointment or stop by- Open Door!</i>	

Seth McGee (Biocore Lab Manager) 339 Noland Hall, seth.mcgee@wisc.edu , 608-262-6189 <i>Make an appointment or stop by- Open Door!</i>				
Lab	Disc Time	Lab Time	Teaching Assistants / uTAs	
1	MON 11:00 - 11:50 am	TUES PM (1:20-4:20)	<p><u>Graduate TA :</u></p> <p>Matthew Pereyra- pereyra@wisc.edu</p> <p><u>Undergraduate TA (uTA) :</u></p> <p>Madelyn Reilly - mjreilly2@wisc.edu</p>	 
2	MON 1:20 - 2:10 pm	WED PM (1:20-4:20)	<p><u>Graduate TA :</u></p> <p>Jax Phillips- jax.phillips@wisc.edu</p> <p><u>Undergraduate TA (uTA) :</u></p> <p>Lucy Minner - lminner@wisc.edu</p>	 

Course Learning Outcomes

Building on your experience in the previous Biocore 382 and/or 384 laboratories, the overall learning outcomes of this lab are for you to:

1. Appropriately utilize Biocore 485 **lecture concepts** in an applied setting.
2. Engage in the **process of science**, including the problem-solving involved in designing and executing experiments, and the critical thinking required to carefully analyze and interpret results.
3. Work with **tools & procedures** to investigate biology.
4. Concisely, clearly, and precisely communicate your plans and findings to others using written and oral communication
5. Utilize quantitative reasoning skills (statistical analysis skills).
6. Work as a member of a **productive, collaborative research team**.
7. Build on, apply, and **integrate concepts & skills** that you learn in other Biocore courses.
8. Contribute to an inclusive, safe, socially and ethically responsible research and learning environment



We recognize that you will not master all of these learning outcomes right away. We expect that your level of achievement will improve from your previous Biocore lab experience and grow as you progress through this fall semester.

As a member of a permanent 4 person research team, you will work each week on some stage of designing or carrying out your own experiments on plant or animal physiology. During the semester your team will have 2 opportunities to develop an experiment to test a hypothesis based on a novel research question. Research topics will likely (but not necessarily) be chosen from concepts taught concurrently in the Principles of Physiology Biocore 485 lecture course. During the semester your research team will report your findings through oral team presentations and by writing, peer-reviewing, and revising your work in the format of scientific papers and posters.

You will continue to practice the various elements of experimental design (development of good questions, review of relevant literature, hypothesis formation, protocol development, analysis (data manipulation, graphing, statistical tests, comparison with previous findings), and making logical, evidence-based conclusions. You will hone your analytical and critical thinking skills through the process of peer review, paper revision, and literature review.

Based on our previous experiences, we hypothesize that you will have more than a little fun, and learn some pretty important life skills as you achieve these learning outcomes this semester. ☺



Grading: Opportunities to Demonstrate the Learning Outcomes

You will be participating in both individual assignments and group assignments. Note that because of the team assignments and the possible Unit 2 team poster, somewhere between 31- 44% of your final semester grade results from "Team" efforts. Assignments, individual vs team mode, and assignment weight in percent are detailed in the table below. Papers, formal presentations and posters are graded using rubric criteria described in the Biocore Writing Manual or Biocore 486 Lab Manual and reported to you as a letter grade (A+, A, A-, AB, B+, B, B-, BC, C+...).

Assessment	Individual or Team	Weight (%)
Statistics Assignment	Individual	3
Unit 1 Research Proposal paper	Individual	12
Unit 1 Research Proposal paper peer review	Individual	2
Unit 1 Biological Rationale figure w/ legend & Statistics Plan	Team	3
Unit 1 Formal Presentation	Team	14
Unit 1 Final Paper	Individual	16
Unit 1 Final Paper peer review	Individual	2
Unit 2 Research Proposal paper	Individual	12
Unit 2 Research Proposal paper peer review	Individual	2
Unit 2 Final Poster Presentation	Team	14
Unit 2 Final Poster or Paper	Team or Individual	13
Participation		7
	Total	100

Presentations

You and your team will give 2 formal, 15-minute presentations to summarize your respective research projects. One presentation will use PowerPoint slides while the second presentation will use an electronic research poster format. (See the Biocore Writing Manual and the Presentation rubric in the appendix of the Biocore 486 Lab Manual for our expectations.) Each member of the team is expected to make an equivalent contribution to the presentation and to the Q&A following the presentation. You will be given a team grade for these presentations. Your team will also prepare and present PowerPoint proposal feedback presentations as you plan your Unit projects. These presentations are not graded, but will allow you to receive valuable feedback from your instructors and peers.

Peer review grade

You will have 3 opportunities to be a peer reviewer (and have your papers reviewed) this semester. You will turn in a copy of the review you received with each paper along with an author's response form that briefly explains major revisions as well as what advice you took and did not take from your reviewer, and

why. Your peer review grades will be based on your efforts in filling out both the peer review and author's response sheets. Collectively the peer reviews are worth 6% of your total semester grade.

Check Assignments

Check (v) assignments are scored simply adequate or inadequate. These include at least one peer reviewed paper by an undergraduate TA during the semester, and scheduled practice run-throughs of PowerPoint/poster team presentations with undergraduate TAs. Completion of check assignments will be taken into account as part of your Team & Class Participation grade.

How your final grade is earned

We use an absolute grading scale in 486 (no curves!). Paper and presentation letter grades are converted to numeric values when final grades are tallied at the end of the semester. Your Participation grade will be determined by a variety of inputs such as your attendance, participation in class discussions (e.g., the Q&A following feedback and formal presentations), participation in research with teammates, completion of check assignments, and feedback from your GEA (Group Effort Analysis) forms as well as the GEA form feedback from your permanent team members. Your Participation grade will be weighted as 7% of your final semester grade.

Each assignment is weighted as stated in the table above and converted to a percentage score. Your final grade will be determined from the sum of your letter grade assignments. Your final percentage score is converted to a final letter grade as follows:

<u>Final Assignment %</u>	<u>Letter Grade</u>
90-100	A
80-89.9	B
70-79.9	C
60-69.9	D
<60	F

For those few individuals that are on the borderline at the end of the semester, we will assign intermediate grades (AB and BC) based on graded assignments and our evaluation for your participation (in both lab AND discussion).

Teaching & Learning Data Transparency Statement

The privacy and security of faculty, staff and students' personal information is a top priority for UW-Madison. The university carefully evaluates and vets all campus-supported digital tools used to support teaching and learning, to help support success through [learning analytics](#), and to enable proctoring capabilities. View the university's full [teaching and learning data transparency statement](#).

Privacy of Student Records & the Use of Audio Recorded Lectures Statement

See more information about [privacy of student records and the usage of audio-recorded lectures](#).

Course materials and recordings for this course are protected intellectual property at UW-Madison. Students in this course may use the materials and recordings for their personal use related to participation in this class. Students may also take notes solely for their personal use. If a class meeting is not already recorded, you are not authorized to record class meetings without Anna Kowalkowski's permission unless you are considered by the university to be a qualified student with a disability requiring accommodation.

[Regent Policy Document 4-1] Students may not copy or have course materials and recordings outside of class, including posting on internet sites or selling to commercial entities. Students are also prohibited from providing or selling their personal notes to anyone else or being paid for taking notes by any person or commercial firm without the instructor's express written permission. Unauthorized use of these copyrighted course materials and recordings constitutes copyright infringement and may be addressed under the university's policies, UWS Chapters 14 and 17, governing student academic and non-academic misconduct.

How to Succeed in This Course

Your presence and participation in class is extremely important for your learning and the establishment of a positive, effective learning environment for everyone (students and instructors). With this in mind, we ask that you engage in listening and participate in class discussion, ask questions, take notes, and DO NOT study for other courses during our class meeting time.

Here are resource links to other campus services:

- [University Health Services](#)
- [Undergraduate Academic Advising and Career Services](#)
- [Office of the Registrar](#)
- [Office of Student Financial Aid](#)
- [Dean of Students Office](#)

Course Evaluations

Students will be provided with an opportunity to evaluate this course and your learning experience via mid-semester and final course evaluations. Student participation is an integral component of this course, and your confidential feedback is important to instructors. You are strongly encouraged to participate in the course evaluation.

Students' Rules, Rights & Responsibilities

Please use [this link](#) above to access information about UW-student privacy rights (FERPA).

Creating a Diverse and Inclusive Community and Classroom

Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals. The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world.

<https://diversity.wisc.edu/>

In Biocore, we strive for the utmost equity for all students, TAs, and faculty/ staff. We are a community of students and instructors committed to and in full support of students who identify as Black, Brown, Indigenous, students of color, students with disabilities; students with racial, ethnic, gender, LGBTQ+ diverse identities. Your perspective, your learning, your interests, and your contributions matter within our engaged learning community. Our community and our science depend on engaging and embracing

different perspectives and this starts with each of us understanding and recognizing our own biases. It takes a great deal of awareness and self-work to recognize bias and our own lack of awareness/ ignorance on specific topics. As a program, we all need to work on this recognition and how to hold each other accountable. Accountability in this context is a willingness to accept responsibility for ourselves, our intentions, words, and actions—when it comes to mitigating discrimination, microaggressions, and bias in all of its forms.

If you experience or notice discriminatory behavior or language

We, as Biocore program faculty and staff, encourage you to speak up in the moment if it is safe to do so and to let us, Biocore faculty and staff, know. We promise to hold ourselves accountable in the event of any such offenses. If the incident reoccurs despite intervention or you continue to experience bias, do not hesitate to bring this to your instructor's attention and/or report the case through [UW Madison's Bias Incident Reporting system](#).

Accountability: What to do when you do or say something that offended

Apologize, say 'I'm sorry' and take ownership when you have offended someone, even if it was unintentional. Saying nothing to remedy the situation perpetuates inequality. Taking responsibility for your words, actions, and behaviors is how you can be accountable to our community and our inclusive classroom goal. It takes everyone to create an accountable, supportive and productive learning environment. Biocore thrives when all individuals feel supported, especially those who are historically underrepresented at the university. As a learning community, we hope to support all students and staff to the fullest extent. This relies on instilling a trustful, accepting, and accountable environment for all.

[See strategies and suggestions for navigating difficulties in the classroom](#) (adapted from "Promoting Inclusive Classroom Dynamics in Higher Education" by Kathryn C. Oleson).

Group work, participation, and inclusive mindsets

Learning to work as an *inclusive, productive, and collaborative* member of a team is an essential skill for all professionals and is an important learning goal for Biocore 486. Learning to have an inclusive mindset includes being aware / proactively engaging with diverse perspectives among individuals in our learning community, and aims to decrease the barriers to hear and exchange diverse perspectives- especially for those who are traditionally marginalized. Inclusive behaviors include inviting and valuing other's ideas, listening and learning before making judgements, taking personal responsibility and being accountable, and creating a welcoming, connective, and affirming attitude towards others.

Collaborative, inclusive team work increases the number of perspectives focused on a complex problem, and it increases creativity and capacity for productive work! Unfortunately, group work can sometimes be challenging and unproductive if team members do not value or invest in the team or shared goal or if one or two students dominate over others. We consider collaboration a skill that needs practice, patience, and intention to become competent. Throughout the semester you will be working with different personalities

and diverse perspectives. Part of your work as a good team member is your *independent accountability* for the knowledge you gain & the work you do while respecting and encouraging the work of others.

Academic Integrity Statement

By virtue of enrollment, each student agrees to uphold the high academic standards of the University of Wisconsin-Madison; academic misconduct is behavior that negatively impacts the integrity of the institution. Cheating, fabrication, plagiarism, unauthorized



collaboration, and helping others commit these previously listed acts are examples of misconduct which may result in disciplinary action. Examples of disciplinary action include, but is not limited to, failure on the assignment/course, written reprimand, disciplinary probation, suspension, or expulsion. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to <https://conduct.students.wisc.edu/academic-misconduct/>

Biocore Statement of Academic Integrity

We trust you to do your own, best work on all individual assignments, and that all team members will equivalently contribute to all group assignments. Remember, you formally agreed to this when you signed the Biocore Honor Code last fall (the six principles of the Biocore Honor Code are below). If you have exceptional circumstances that prohibit you from doing your own, best work, please see us to talk about it.

What is academic integrity and why are we promoting it? Academic integrity means being honest about your intellectual work which is fundamental to the pursuit of knowledge. We ask you to sign this honor code as a pact between you and the Biocore Program faculty/staff to abide by the academic rules of conduct laid out by the University. Without these rules of conduct our institution would be severely limited in its capacity to function as community of higher learning.

As a UW-Madison student, it is your responsibility to be informed about what constitutes academic misconduct, how to avoid it and what happens if you decide to engage in it. For more information, see <https://conduct.students.wisc.edu/academic-misconduct/> These guidelines protect both you and the university if an infraction has occurred. Ignorance of these regulations is not a defense in cases of infringement. So.. Just DON'T Do It!

Definition of Academic Dishonesty

Misconduct includes the following, but is not limited to this list:

- Seeks to claim credit for the work or efforts of another without authorization or citation (plagiarism)
- Uses unauthorized materials or fabricated data in any academic exercise (using notes for a closed-book online exam)
- Forges or falsifies academic documents or records (having a friend sign you in for attendance when you're absent)

- Intentionally impedes or damages the academic work of others (tampering with another student's experiment)
- Engages in conduct aimed at making false representation of a student's academic performance (altering test answers and submitting the test for regrading)
- Assists other students in any of these acts

Examples include but are not limited to: cutting and pasting text from the web without quotation marks or proper citation; paraphrasing from the web without crediting the source; using notes or a programmable calculator in an exam when such use is not allowed; using another person's ideas, words, or research and presenting it as one's own by not properly crediting the originator; stealing examinations or course materials; changing or creating data in a lab experiment; altering a transcript; signing another person's name to an attendance sheet; hiding a book knowing that another student needs it to prepare an assignment; collaboration that is contrary to the stated rules of the course, or tampering with a lab experiment or computer program of another student."

Consequences for Academic Dishonesty

To determine whether academic dishonesty has occurred, the instructor and Biocore administrators will meet with the student. In Biocore, students who commit acts of academic misconduct will write a letter describing what they did and, if appropriate, apologize to individuals who were involved in the incident. In alignment with the penalties listed in the University's UWS14, Student Academic Disciplinary Procedures we recognize three levels of consequences (1) An oral reprimand; and (depending on the severity of the case) written reprimand presented only to the student; or an appropriate assignment to be evaluated by the instructor or Biocore administrative staff, (2) a lower or failing grade on the assignment, exam, or course; removal of the student from the course or program; and a written reprimand included in the student's university disciplinary file, (3) recommendation for disciplinary probation for up to 2 years, suspension, or expulsion from the University.

Biocore Honor Code

You were asked to sign a statement upon entering the Biocore program during the first week of class in Biocore 381. Recall that in order to participate in the Biocore Program you agreed to the following principles:

1. I will report laboratory data honestly and accurately. Under no circumstances will I fabricate data or change data to fit what I think it should be.
2. All work that I submit under my name will be my own. I will not copy or paraphrase from another student presently or previously enrolled in this course.
3. For projects where collaboration is explicitly permitted, I will list the names of students with whom I worked.
4. I will not allow another student to copy or "borrow" my laboratory reports or other assignments.
5. I will not forge or falsify academic documents including graded assignments and examinations
6. I will strive to make Biocore a community that is based on honesty and integrity.

Accommodations for Students with Disabilities Statement

The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and

UW-Madison policy ([UW-855](#)) require the university to provide reasonable accommodations to students with disabilities to access and participate in its academic programs and educational services. Faculty and students share responsibility in the accommodation process. Students are expected to inform faculty [me] of their need for instructional accommodations during the beginning of the semester, or as soon as possible after being approved for accommodations. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to provide reasonable instructional and course-related accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA. (See: [McBurney Disability Resource Center](#))

Academic Calendar & Religious Observances

Use [this link](#) to find information about the current and future academic calendars, along with the university's religious observance policy.

Weekly Schedule & General Course Information

“Living organisms are historical entities representing the successful outcomes of millions of years of environmental testing applied to different phenotypes and genetic backgrounds.”

Schwenk et. al. (2009) Grand challenges in organismal biology.
Integrative and Comparative Biology 49(1):7-14



Biocore 486 Weekly Schedule Fall 2022

Week	Date	Lab Activity OR Discussion Activity	Assignment Type	Weight (%)
1 (LAB)	9/5 – 9/9	Welcome to Biocore 486 and Noland Hall!! <ul style="list-style-type: none"> Working on ✓ Assignment: attend lab open hours to practice using equipment (Equipment Orientation Stations) 	Individual	✓
2 (Disc)	9/12 – 9/16	Expectations for Discussion & Team Building <ul style="list-style-type: none"> ✓ Assignment: Team agreement due end of discussion Working on: Schedule 10 min conference with graduate TA 	Team	✓
2		Intro to Biocore 486 lab <ul style="list-style-type: none"> Course info, teamwork & experimental design expectations Intro to Unit 1: Animal Physiology: human and animal model systems Working on ✓ Assignment: Animal User Orientation Working on ✓ Assignment: Physiology Stations Assignment Due: <ul style="list-style-type: none"> ✓ Assignment: Reflections on Diversity, Equity & Inclusivity ✓ Assignment: Equipment Orientation Stations 	Individual	✓
3 (Disc)	9/19 – 9/23	Refining Unit 1 project; prepare PPT proposal slides		
3		Informal feedback PPT proposal presentation of Unit 1 research plan <ul style="list-style-type: none"> Working on Assignment: Unit 1 Proposal paper; choose peer review partner; send to partner at least 48 hours before Week 4 discussion Assignment Due: <ul style="list-style-type: none"> Teams complete Animal Unit Materials form and give to Seth by end of lab. ✓ Assignment: Animal User Orientation ✓ Assignment: Physiology Stations *✓ Assignment: send your paper draft to an undergrad TA for peer review <p>*At least one paper must be peer reviewed by uTA during the semester to fulfill this check (✓) assignment.</p>	Team Individual	✓ ✓
4 (Disc)	9/26– 9/30	Peer review partners meet to discuss Unit 1 proposal papers		
4		Open Lab: Unit 1 pilot studies		
5 (Disc)	10/3- 10/7	Refresher: <ul style="list-style-type: none"> Data Management Plans (DMP's) Biorationale rubric Assignment Due: <ul style="list-style-type: none"> Teams upload Weekly Plan to Canvas by end of discussion. <p>(485 Exam 1 Oct. 3)</p>	Team	✓

5		Open Lab: Unit 1 pilot studies/data collection <ul style="list-style-type: none"> Working on Assignment: preparing <u>practice</u> team PPT formal presentation Assignment Due: <ul style="list-style-type: none"> Unit 1 Proposal Paper (12%) + peer review (2%) + author's response due 48 hours after Week 5 lab 	Individual	14%
6 (Disc)	10/10-10/14	Refining Unit 1 project <ul style="list-style-type: none"> Prepare PPT presentation slides Schedule practice presentation with uTAs 	Team	✓
6		Preliminary results <ul style="list-style-type: none"> Working on Assignment: Team consensus BR figure & legend Assignment Due: <ul style="list-style-type: none"> Choosing Stats for Unit 1 anticipated data 	Team Individual	✓ 3%
7 (Disc)	10/17 - 10/21	Communicating Scientific Reasoning <ul style="list-style-type: none"> Biorationale flowchart exercise Teams work on consensus BR figure & legend, w/ references 		
7		Team <u>practice</u> formal/final PPT presentations of Unit 1 Project Assignment Due: <ul style="list-style-type: none"> Team consensus BR figure & legend w/ references + Unit 1 Statistics plan due 48 hours after lab 	Team	3%
8 (Disc)	10/24-10/28	Connecting Conclusions to your knowledge gap <ul style="list-style-type: none"> Symmetry of Introduction & key components of Discussion section Teams work on statistics plan Mid-semester course evaluation (485 Exam 2 Oct. 24)		
8		Open Lab: Complete Unit 1 data collection <ul style="list-style-type: none"> Team – instructor meetings to discuss practice PPT presentation & stats plan 		
9 (Disc)	10/31 – 11/4	Preparing to communicate your science <ul style="list-style-type: none"> Teams finalize PPT slides Assignment Due: <ul style="list-style-type: none"> ✓ Assignment: Teams practice presentations with uTA 	Team	✓
9		Team formal/final PPT presentations of Unit 1 projects <ul style="list-style-type: none"> Working on Assignment: Unit 1 final paper; students choose peer review partner; Send paper to peer review partner 48 hours before Week 10 discussion 	Team	14%
10 (Disc)	11/7-11/11	Peer review partners meet to discuss Unit 1 final papers		
10		Intro to Unit 2: Plant Physiology Assignment Due: <ul style="list-style-type: none"> Unit 1 final paper (16%) + peer review (2%) + author's response to TA + GEA due 48 hours after Week 10 lab 	Individual	18%

11 (Disc)	11/14 – 11/18	Refining Unit 2 project; prepare PPT proposal slides		
11		Informal feedback PPT proposal presentation of Unit 2 research plan <ul style="list-style-type: none"> Working on Assignment: Unit 2 Proposal paper; students choose peer review partners Assignment Due: <ul style="list-style-type: none"> Teams complete Plant Unit Materials form and give to Seth by end of lab. *√ Assignment: send your paper draft to an undergrad TA for peer review *At least one paper must be peer reviewed by uTA during the semester to fulfill this check (√) assignment.	Team Team	√ √
12 (Disc)	11/21 – 11/25	Teams finalize Unit 2 weekly plan Assignment Due: <ul style="list-style-type: none"> Upload Weekly Plan to Canvas by end of discussion. (485 Exam 3 Nov. 21)	Team	√
No labs meet during Thanksgiving Break				
13 (Disc)	11/28 - 12/2	Peer review partners meet to read segments of proposal papers and discuss Unit 2 proposal papers		
13		Open Lab: Unit 2 pilot studies Assignment Due: <ul style="list-style-type: none"> Unit 2 proposal paper w/ DMP (12%) + peer review (2%) + author's response due 48 hours after Week 13 Lab 	Individual	14%
14 (Disc)	12/5 – 12/9	Electronic Poster Workshop <ul style="list-style-type: none"> poster design principles creating interactive posters with hyperlinks 		
14		Open Lab: Complete Unit 2 data collection/analysis <ul style="list-style-type: none"> Team-instructor data analysis consultations Working on Assignment: Unit 2 formal electronic poster presentation and uTA practice presentation 		
15 (Disc)	12/12 – 12/16	Preparing to communicate your science <ul style="list-style-type: none"> Teams finalize Unit 2 electronic poster Practice poster presentations with uTAs 	Team	√
15		Team final POSTER presentations of Unit 2 projects <ul style="list-style-type: none"> Working on Assignment: Unit 2 final revised team poster OR revised individual final/re-proposal paper 	Team	14%
Finals week		Assignment Due: <ul style="list-style-type: none"> Unit 2 final paper/poster OR revised proposal paper/poster + GEA form due @ 5pm on Thursday Dec. 15 (Tuesday lab) or @ 5pm Friday Dec. 16 (Wednesday lab) (485 Final Exam Dec. 17)	Team or Individual	13%
	All	Team & Class Participation	Individual	7%

Collaboration on assignments

This semester you will be assigned to a permanent research team. We expect you to discuss ideas and work through problems and analyses with your classmates, especially your teammates. You will do two formal team presentations, one using PowerPoint slides and the other using an electronic poster. You must write proposal and final papers on your own. Your final Unit 2 project can be summarized either within a team poster or as an individually prepared final paper; you and your teammates will decide. Note that because of the team assignments and the possible Unit 2 team poster, somewhere between **31- 44%** of your final semester grade results from "Team" efforts.

Your Team & Class Participation grade will be determined by a variety of inputs such as your attendance to class meetings, participation in class discussions (e.g., the Q&A following feedback and formal presentations), interactions with your instructors and teammates, completion of check assignments, and feedback from your GEA (Group Effort Analysis) forms. Your Team & Class Participation grade will be weighted as **7%** of your final semester grade.

Papers

Final unit papers are to be written in the form of a scientific research paper or grant proposal and are graded using Biocore rubric criteria. Collaborators must be listed on documents submitted by a research team.

Statistics

You and your team are expected to use appropriate statistical tests given your experimental design and hypothesis. The Biocore Statistics Primer is available on Canvas as a link to an online Pressbooks e-text. Other statistical resources should be appropriately cited.

Research Notebook

You will keep a logbook, or research notebook, of your research activities throughout the semester (see "*Keeping a Good Research Notebook*" section in this 486 lab manual for further details). We expect each team to set up an electronic shared (e.g. Google Doc) logbook using the Biocore 486 Research Notebook template. Each team will provide a link to their team research notebook with each paper submission.

Late Assignment Policy

Papers & assignments must be handed in on time unless you have contacted your graduate TA or Anna ahead of time to request an extension due to emergency or extenuating circumstances. Otherwise, we will deduct one grade per weekday your assignment is late from the grade you would have received (e.g., A→AB for one day late). Note that even an F grade (one week late) counts more than 0 (not handed in at all) when we total the final grades at the end of the semester. If you know of a religious observance or other commitment that will keep you from attending class, let Anna Kowalkowski know by **Sept. 16th**.

Accommodations

The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform Anna Kowalkowski of their

need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Anna Kowalkowski will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA.

Questions regarding classroom accommodations can be directed to the McBurney Disability Resource Center (mcburney@studentlife.wisc.edu, 608/263-2741).

Mindfulness & Breathing Exercises

As in previous Biocore lab courses, we will begin each lab session with a brief one minute mindfulness exercise where we will ask you to relax and quietly focus on your breathing for a minute or so. We will practice breathing, deeply and mindfully, to help gain focus, heighten awareness and concentration, and to ready our minds for learning. [Researchers at the Center for Healthy Minds](#) right here on the UW Madison campus, are leaders in the neuroscience of breathing and meditation as beneficial for overall well-being. Additionally, as scientists ourselves, it is logical to reason that deep breathing and focus aids in making careful observations, being curious, thinking critically, making judgement, taking wise action, and doing science more generally (perhaps there is a testable question in there). With that, we ask that you try these guided breathing exercises – be curious! Participation in breathing exercises is completely voluntary, NOT part of your participation grade. If you choose not to participate, please respect and support others interests to do so.

Previous Biocore students have reported that this breathing exercise helps them to transition and focus before beginning lab. The University Health Service has [several mindfulness audio files](#) that you may find helpful.

Think about publishing your research

The Journal of Undergraduate Science and Technology (JUST) is a biannual research journal written, edited, and published by UW undergraduates with the missions of supporting undergraduate researchers and making science accessible to the public. Biocore students have the option of submitting their papers as manuscripts to JUST to showcase their efforts in undergraduate research. Recognition in JUST is not only a great way to gain publication reputation, but also an excellent way to inform the community of the wonderful research happening on-campus. The deadline for the Spring issue is typically around early February. More information can be found at justjournal.org/submissions; the submission link, justjournal.org/submit/.