



College of Natural Science MICHIGAN STATE UNIVERSITY

Physiology in Health and Disease (3 Cr) PSL 450 (Sections 001 and 002), Fall 2023

Course Website: <https://d2l.msu.edu/d2l/home/2026271>

Delivery Mode: Hybrid (online asynchronous lectures, plus in-person active learning)

In-person Meeting Time:

Section 001 - Tuesdays 2:40-4:00 PM

Section 002 - Thursdays 2:40-4:00 PM

In-person meeting location: Natural Resources Building, Room 152

Prerequisites: PSL 431 and PSL 432 and Completion of Tier I Writing Requirement. Enrollment is restricted to physiology majors in NatSci or Lyman Briggs College.

1. COURSE OVERVIEW AND DESCRIPTION:

Fundamental principles of physiology provide the foundation for understanding pathophysiology in clinical medicine. You were introduced to foundational physiology knowledge in PSL 431 and PSL 432. In this course, we will build on and apply that knowledge to contemporary research topics. We will focus on 4 clinically significant disease topics (i.e., inflammatory diseases, heart failure, metabolic diseases, and epilepsy). Our goals will be to cover those disease topics in depth, contrast differences between the healthy- and disease-states, and introduce common experimental methods and design. Student grades will be based on the weekly in-class Research Box assignments, two mid-term exams, and two reflective essays on teamwork.

1A. Research Box assignments

For each topic, instructors will provide two recorded lectures on the pathophysiology of the specific disease-related topic. Following each lecture, students will be expected to read and comprehend a research article that is related to the lecture. Students will then meet in-person and work in teams to discuss the research paper and to answer questions related to figures from the paper (i.e. Research Box assignments). The Research Box assignments will consist of four types of questions:

1. Visual model of the **experimental design** (25%)
2. Visual representation of the **results** (25%)
3. Changing experimental **parameters** (25%)
4. **Data interpretation** True/False questions with rationale (25%)

1B. Mid-term Exams

Through the Research Box assignments, students will have weekly practice discussing and interpreting data. Then, students' data interpretation skills will be assessed on two midterm exams. The mid-term exams will consist of two types of questions:

1. **Content** questions that are largely based on the lecture videos. Background knowledge from PSL 431 and 432 might be necessary.
2. **Interpretation of novel data** (True/False). You will be given a figure that is new to you, plus a list of statements. You will decide whether each statement is true or false based on the data in the figure.

1C. Reflective Essays

For the weekly Research Box assignments, students will work in their teams to discuss, interpret, and summarize figures from research articles. You will learn from your teammates and part of your grade will be dependent on your teammates. That can indeed be stressful, but there are things that each student can do to improve the way their team functions and to lower stress. Research has shown that people are better at teamwork if they are specifically taught about teamwork.¹ Thus, we will use the teamwork heuristic of Salas *et al.*² to help students understand six elements of teamwork: cooperation, coordination, cognition, conflict, coaching, and communication. At two points in the semester, you will write a reflective essay on an element of teamwork and describe your plan for incorporating tips from Salas *et al* to improve the functioning of your team. Your reflective essays will be graded according to the Reflection on Action Rubric³, which we introduced to you in PSL 101 Frontiers in Physiology.

1. Earnest, M.S., Williams J., Aagaard E. M., Toward an Optimal Pedagogy for Teamwork. *Academic Medicine*. 2017;92:1378–1381.
2. Salas E., Shuffler M.L., Thayer A.L., Bedwell W.L., Lazzara E.H. Understanding and improving teamwork in organizations: A scientifically based practical guide. *Human Resource Management*. 2015;54:599-622.
3. Hoffman LA, Shew RL, Vu TR, Brokaw JJ, Frankel RM. Is reflective ability associated with professionalism lapses during medical school? *Acad Med*. 2016 Jun;91(6):853-7.

2. COURSE OBJECTIVES:

By studying the recorded lectures, participating in Research Box assignments, and reflecting on teamwork, students will be able to do the following:

1. Recall and apply content knowledge in different disease areas.
2. Apply quantitative thinking and critical reasoning to answer questions in different disease areas.
3. Explain experimental design and data interpretation.
4. Interpret data presented in graphical, tabular, and micrograph form.
5. Compare, contrast, and make inferences from published research studies.
6. Create pictorial models that illustrate experimental design.
7. Apply external evidence to evaluate their teamwork skills.

3. REQUIRED TEXTBOOK AND OTHER COURSE MATERIALS:

There will be no required textbook for this class. However, the Desire2Learn (D2L) course website will be a crucial course resource. Online lectures, corresponding lecture slides, and research papers will be posted to the D2L website. Students should be prepared to access lecture material from each of the following file formats: MS Word (.doc or .docx), MS PowerPoint (.ppt or .pptx), Adobe Reader (.pdf), and Google documents. Navigate to the D2L Course Website and click on: FS23-PSL-450-ALL SECTIONS - Physiology in Health and Disease.

4. FALL 2022 MSU HOLIDAYS AND IMPORTANT COURSE DATES:

Fall Classes Begin:	Monday August 28
University Closed:	Monday Sept 4 (Labor Day Holiday)
No classes:	Monday Oct 23 – Tuesday Oct 24 (Fall break)
University Closed:	Thursday Nov 23 – Friday Nov 24 (Thanksgiving Holiday)
Fall Classes End:	Friday Dec 8
Final exam:	Wednesday December 13, 10:00 AM – 12:00 PM (both sections)

5. INSTRUCTORS, TOPICS, AND CONTACT INFORMATION:

5A. Course Coordinators

For general course related issues contact the Course Coordinators by email at psl450@msu.edu. General course related issues include absences, grades, deadlines, exams, course policies, teamwork, and reflective essays.

- **Lori Seischab, Ph.D (she/her):** psl450@msu.edu. Office hours are Mondays, 10:00-11:00 AM in 2240 Biomedical Physical Sciences building. Office hours will not take place on the first day of the semester (August 28), Labor Day (September 4), and Fall Break (October 23).
- **Nara Parameswaran, Ph.D. (he/him):** psl450@msu.edu. Office hours by appointment.

5B. Co-instructors

For individual section-related issues, e-mail the respective instructors directly. Section-related issues include office hours, lecture content, and research article content. At the start of an instructor's module, they will post their office hour information in the Announcements section of D2L.

- **Nara Parameswaran, Ph.D. (he/him):** Inflammatory diseases. Email: narap@msu.edu
- **Karl Olson, Ph.D. (he/him):** Metabolic Diseases. Email: olsonla@msu.edu
- **Shane Crandall, Ph.D. (he/him):** Epilepsy. Email: cranda86@msu.edu
- **Jason Bazil, Ph.D. (he/him):** Heart Failure. Email: jnbazil@msu.edu

5C. Teaching Assistant

Contact the Teaching Assistant regarding technical aspects of D2L and her office hours. The Teaching Assistant will be in class along with the instructor to answer questions while students are working on their Research Box assignments. The TA will help instructors grade Research Boxes.

- **Alyssa Vadovsky, B.S. (she/her):** vadovsky@msu.edu

6. CLASS ATTENDANCE AND PARTICIPATION:

Attendance for in-person class is required and attendance will be taken. Because the in-person class sessions primarily consist of teamwork and discussion, they will not be recorded. Students with an **unexcused** absence for the day will receive a 0 for that week's Research Boxes. Students with an **excused** absence will not receive a grade for that week. Consequently, the Research Box portion of their course grade will be calculated using fewer than 12 Research Boxes. To be considered for an excused absence, students are expected to email the coordinators at psl450@msu.edu prior to the class with documentation for the absence.

7. REQUIRED TECHNOLOGIES:

The course requires access to high-speed internet so that you can watch the lecture videos. Lecture materials (online lecture videos and papers for Research Box discussions) will be posted to D2L. Please check to make sure you are using a D2L compatible browser here: https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

8. COURSE PLATFORM:

This course will be delivered in a hybrid format. You will need your MSU NetID to login to the course from the *D2L homepage* (<http://d2l.msu.edu>). In D2L, you will access lecture videos, lecture slides, papers for discussion, etc. Each section will meet in person once per week (section 001 on Tuesdays and section 002 on Thursdays) to work on the Research Boxes in class.

9. TECHNICAL ASSISTANCE:

If you need technical assistance at any time during the course or to report a problem, you can:

- Visit the MSU Help site at <http://help.msu.edu>
- Visit the Desire2Learn Help Site at <http://help.d2l.msu.edu>
- Call the MSU IT Service Desk at (517)432-6200, (844)678-6200, or e-mail at ithelp@msu.edu

10. COURSE POLICIES

10A. Learning Continuity Statement:

If you become unable to attend class for an extended time, you are expected to e-mail the coordinators (psl450@msu.edu) as soon as you are able. In most cases, the regular course policies related to grading will apply. In extraordinary cases, we will work with the student to devise a reasonable pathway for successfully completing the course.

10B. Course continuity statement:

If any specific instructor becomes unable to run the course for an extended time, students will receive an e-mail from the coordinators regarding any changes to the course.

10C. Intellectual property policy:

As members of a learning community, students are expected to respect the intellectual property of the instructor. All course materials presented to students are the copyrighted property of the course instructor and are subject to the following conditions of use:

1. Students may not post the recordings or other course materials online or distribute them to anyone not enrolled in the class without the advance written permission of the course instructor and, if applicable, any students whose voice or image is included in the recordings.
2. Any student violating the conditions described above may face academic disciplinary sanctions.

10D. Course accommodations:

Michigan State University is committed to providing equal opportunity for participation in all programs, services, and activities. Requests for accommodations by persons with disabilities may be made by contacting the Resource Center for Persons with Disabilities. For an appointment with a disability specialist, call 884-7273 (voice), 355-1293 (TTY), or visit [the MSU RCPD Website](#) by clicking on this link. Such students should provide their accommodation letter to Drs. Seischab and Parameswaran (psl450@msu.edu) early in the semester because accommodations cannot be applied retroactively.

10E. Inclusion:

“MSU welcomes a full spectrum of experiences, viewpoints, and intellectual approaches because they enrich the conversation, even as they challenge us to think differently and grow. However, we believe that expressions and actions that demean individuals or groups compromise the environment for intellectual growth and undermine the social fabric on which the community is based.” -MSU Faculty Senate 2017.

MSU is committed to creating and maintaining an inclusive community in which students, faculty, and staff can work together in an atmosphere free from all forms of discrimination. The Office of Institutional Equity (OIE) reviews concerns related to discrimination and harassment based on sex, gender, gender identity, race, national origin, religion, disability status, and any other protected categories under the [University Anti-Discrimination Policy](#) and [Policy on Relationship Violence and Sexual Misconduct](#). If you experience or witness acts of bias, discrimination, or harassment, please report these to the Office of Institutional Equity (OIE) website: <http://oie.msu.edu/>.

During all course activities, let us all strive to:

- Remain open. Ask yourself, am I being judgmental? Have I stopped listening?
- Be mindful of intent and impact. Ask yourself, did they intend to hurt me? Was the impact of my words hurtful?

All skills can be practiced, and with practice we improve. Let us dedicate this semester to intentionally practicing inclusion skills.

10F. Academic Integrity and Artificial Intelligence

PSL 450 is based on a high-impact educational practice called writing-to-learn (WTL). WTL helps students think through and make sense of complex concepts.⁴ It leads to deeper learning. As such, it is not appropriate nor is it allowed for students to use artificial intelligence (AI) in any way for the Research Box assignments.

4. Kuh, G. D. High-impact educational practices: What they are, who has access to them, and why they matter. American Association of Colleges & Universities. 2008

11. GRADING POLICY

11A. Grade Dissemination:

The grades for Research Boxes, teamwork essays, and mid-term exams will be posted in the D2L Gradebook. Final course grades will be reported through the Office of the Registrar. Email the coordinators (psl450@msu.edu) if you wish to discuss your performance in the course or your grade in general.

11B. Assessments and the Calculated Course Grade:

This course will be calculated as detailed below.

Assessment	Percentage of course grade	Description
Research Boxes**	45%	12 Research Boxes (RB). Each RB is worth 3.75% of your course grade.
Midterm Exams	45%	2 Midterm Exams. Each midterm exam is worth 22.5% of your course grade.
Teamwork Essays**	10%	2 Teamwork Essays. Each essay is worth 5% of your course grade.

**For detailed instructions on Research Boxes and Teamwork Essays, go to the respective documents provided separately.

11C. Policies for Graded Course Activities

Midterm exams

Midterm exams will be given in-person. Students with a legitimate emergency, such as illness, may be permitted to take a make-up exam if written documentation is provided confirming the problem. Such documentation must be provided by a physician or other disinterested party. For example, documentation from Olin Health Center must include a "recommendation for excused absence" on the "Patient Instruction Sheet." Such documentation, in whatever form, must be submitted to Drs. Seischab and Parameswaran (Course Coordinators: email psl450@msu.edu) 24 hours before the make-up is given, if possible. Arrangements to schedule a make-up exam should be negotiated with the coordinators as soon as possible, preferably within 24 hours of the missed exam.

NO QUESTIONS ON CONTENT WILL BE ANSWERED DURING THE MIDTERM EXAMS, as any communication that occurs during an exam is inappropriate and may unfairly advantage some students over others. Proctors will be available to address concerns such as a missing exam page, a broken pencil, or smudged font. Exams will be reported to the D2L course grade book. Scoring errors and/or student appeals to re-evaluate individual questions must be submitted to the course coordinators within 48 hours of the time exam results are distributed. To receive consideration, such appeals must be submitted in writing (e.g., by e-mail to psl450@msu.edu) and should include justification for why an alternate answer deserves to receive credit. You cannot appeal a question that you did not answer.

Teamwork essays

Essays will be graded using the six-point Reflection on Action Rubric³. For example, essays that score 6 out of 6 will receive a grade of 100%. Essays that score 5 out of 6 will receive a grade of 83.3%. Essays that score 4 out of 6 will receive a grade of 66.7%. Etc. Since reflective writing takes practice, the first teamwork essay can be revised and resubmitted. The two scores will be averaged. The second teamwork essay cannot be resubmitted.

11D. Final grade – provisional grading scale:

This Calculated Course Grade will be determined based on the scheme described in 11B. The course coordinators may decide to award extra credit for course surveys. Course surveys will be announced by e-mail and administered through Qualtrics.

Students with Calculated Course Grades of 90.0%, 80.0%, 70.0%, and 60.0% are assured of receiving minimum final grades of at least 4.0, 3.0, 2.0, and 1.0, respectively. Course faculty reserve decision on the minimum score for each grade, and particularly on how to apportion the grades among the lower quartile of the class. Petitions to re-evaluate a course grade will be considered in writing only (e.g. by e-mail) and must be submitted to Drs. Seischab and Parameswaran (psl450@msu.edu) within one week after the beginning of the semester following completion of the course, according to university guidelines.

The table below describes the relationships between Final Grades and Calculated Course Grades.

Final Grade	Calculated Course Grade
4.0	90% to 100%
3.5	85% to 89.9%
3.0	80% to 84.9%
2.5	75% to 79.9%
2.0	70% to 74.9%
1.5	65% to 69.9%
1.0	60% to 64.9%
0.0	Below 60%

12. 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 Department of Physiology 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; the MSU Student Honor Code; and Ordinance 17.00, Examinations. Therefore, you are expected to complete all quizzes and the final exam as an individual effort, without assistance from any other individual whether they are enrolled in the course or not. Students who violate this policy or other MSU rules may receive a penalty grade, including - but not limited to - a failing grade on the assignment or in the course. Contact your instructor if you have any questions about this policy. (Click here for a link to the [Ombudsperson's resources](#) on academic integrity and/or [Spartan Life: Student Handbook and Resource Guide](#)).

Violations of academic integrity include:

- Plagiarism of any kind
- Submitting the work of another and falsely misrepresenting it as your own
- Collaboration or communication with another individual during an exam or quiz, in-person or by using social media, text, phone, or any other electronic means
- Witnessing and failing to report a violation of academic integrity
- Commercialization of lecture notes or other university-provided course materials

SPARTAN CODE OF HONOR:

On March 22, 2016, The Associated Students of Michigan State University (ASMSU) adopted the following Spartan Code of Honor:

"As a Spartan, I will strive to uphold values of the highest ethical standard. I will practice honesty in my work, foster honesty in my peers, and take pride in knowing that honor is worth more than grades. I will carry these values beyond my time as a student at Michigan State University, continuing the endeavor to build personal integrity in all that I do."

13. COURSE AND INSTRUCTOR EVALUATIONS:

The Department of Physiology participates in the Student Perceptions of Learning Surveys (SPLS) system for all its undergraduate courses, including PSL 450. Students are encouraged to submit their opinions of the course and individual instructors at the end of each semester through SPLS. Student anonymity is carefully protected, and students have the option of opting out of the course evaluation survey.

14. GRIEF ABSENCE:

In the event of loss of a family member or similar tragedy, students are directed to the university policy on Grief Absence that can be found at the [Spartan Life Online website](#).

15. RELIGIOUS OBSERVANCES:

Students are expected to notify their instructor in advance if they intend to miss class to observe a holy day of their religious faith. Refer to the registrar's page on [religious observance policy](#). For a current schedule of major religious holidays, see the [office of inclusion and intercultural initiatives](#).

16. POLICIES FOR STUDENT ATHLETES:

MSU policies pertaining to student athletes may be found by clicking on this link: [Student Athletes](#)

17. 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 have the responsibility to report any instances of sexual harassment, sexual violence and/or other forms of prohibited discrimination. If you would rather share information confidentially about sexual harassment, sexual violence or discrimination to an employee who does not have this reporting responsibility, you can find a list of those individuals here <https://caps.msu.edu/>

18. FACE COVERINGS/MASKS

Currently (August 2023), MSU policy does not require faculty, staff, or students to wear face coverings. We expect all members of the MSU community to be supportive of an individual's choice to wear a face covering.

19. COVID policy

If you were exposed to COVID-19, have symptoms of COVID-19, or have a positive COVID-19 test result, please consult MSU's COVID-19 Guidance website <https://msu.edu/together-we-will/covid19-guidance/#testing>

20. CALENDARS FOR IN-PERSON MEETINGS, TEAMWORK ESSAYS, AND MID-TERM EXAMS:

Calendar for Section 001 (Tuesday)

Date	Topic	Class activities	Instructor
August 29	Course structure and Teamwork		Seischab
Sept 5	Teamwork and Research Box introduction		Seischab and Parameswaran
Sept 12	Research Box practice 1	Practice RB 1 and 2	Parameswaran
Sept 19	Research Box practice 2	Practice RB 3 and 4	Parameswaran
Sept 26	Inflammatory diseases 1	RB 1A and discussion	Parameswaran
Oct 3	Inflammatory diseases 2	RB 2A and 2B	Parameswaran
Monday Oct 9	Teamwork essay 1 – due at 11:59 PM		
Oct 10	Heart Failure 1	RB 3A and discussion	Bazil
Oct 17	Heart Failure 2	RB 4A and 4B	Bazil
Oct 24	No class – Fall Break		
Oct 31	Midterm exam 1 – Inflammatory diseases and Heart failure		
Nov 7	Metabolic disease 1	RB 5A and discussion	Olson
Monday Nov 13	Teamwork essay 2 – due at 11:59 PM		
Nov 14	Metabolic disease 2	RB 6A and 6B	Olson
Nov 21	No class because of break		
Nov 28	Epilepsy 1	RB 7A and discussion	Crandall
Dec 5	Epilepsy 2	RB 8A and 8B	Crandall
Wednesday Dec 13	Midterm exam 2 (Final) – Metabolic disease and Epilepsy; 10:00 am – Noon; Room TBA		

Calendar for Section 002 (Thursday)

Date	Topic	Class activities	Instructor
August 31	Course structure and Teamwork		Seischab
Sept 7	Teamwork and Research Box introduction		Seischab and Parameswaran
Sept 14	Research Box practice 1	Practice RB 1 and 2	Parameswaran
Sept 21	Research Box practice 2	Practice RB 3 and 4	Parameswaran
Sept 28	Inflammatory diseases 1	RB 1A and discussion	Parameswaran
Oct 5	Inflammatory diseases 2	RB 2A and 2B	Parameswaran
Monday Oct 9	Teamwork essay 1 – due at 11:59 PM		
Oct 12	Heart Failure 1	RB 3A and discussion	Bazil
Oct 19	Heart Failure 2	RB 4A and 4B	Bazil
Oct 26	No class because of Fall Break		
Nov 2	Midterm exam 1 – Inflammatory diseases and Heart failure		
Nov 9	Metabolic disease 1	RB 5A and discussion	Olson
Monday Nov 13	Teamwork essay 2 – due at 11:59 PM		
Nov 16	Metabolic disease 2	RB 6A and 6B	Olson
Nov 23	No class – University holiday		
Nov 30	Epilepsy 1	RB 7A and discussion	Crandall
Dec 7	Epilepsy 2	RB 8A and 8B	Crandall
Wednesday Dec 13	Midterm exam 2 (Final) – Metabolic disease and Epilepsy; 10:00 am – Noon; Room TBA		