



# College of Natural Science MICHIGAN STATE UNIVERSITY

## Physiology in Health and Disease (3 Cr)

### PSL 450 (Sections 001 and 002), Fall 2022

**Course Website:** <https://d2l.msu.edu/d2l/home/1786798>

**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 from 2:40-4:00 PM

**In-person meeting location:** Engineering Building 1145

#### 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 PSL431 and PSL432. 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.

For each topic, instructors will provide 2 online recorded lectures on the pathophysiology of the specific disease. 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 specific figures (see further instructions on Research Box). Thus, students will read one research article per week throughout the semester.

Through a semester of weekly practice, students will learn how to read and comprehend scientific information related to physiological systems, health, and disease. In addition, they will be introduced to experimental models that help clarify underlying mechanistic basis of disease.

Student grades will be based on weekly D2L quizzes, answers to questions in Research Box (in-class teamwork), the team project (see later), and a final exam.

By participating in online recorded lectures, class activities and completing assigned projects, students will be able to do the following:

1. Recall content knowledge in the different disease areas (Quizzes)
2. Apply quantitative thinking and critical reasoning to answer questions in different disease areas (Quizzes, Research box)
3. Explain experimental design and data interpretation (Research Box, Team project)
4. Interpret data presented in graphical, tabular, and micrograph form (Research box, Team project, Final exam)
5. Compare, contrast, and make inferences from published research studies (Research box, Team project)
6. Create pictorial models that illustrate experimental design, the current understanding of disease mechanisms, or advances in disease treatments (Research box, Team project)

## 2. COURSE PREREQUISITES:

PSL 431 and PSL 432 and Completion of Tier I Writing Requirement; Enrollment Restricted to PSL Majors in NatSci or Lyman Briggs College.

## 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), and Adobe Reader (.pdf). Navigate to the D2L Course Website and click on: FS22-PSL-450-ALL SECTIONS - Physiology in Health and Disease

## 4. FALL 2022 MSU HOLIDAYS AND IMPORTANT COURSE DATES:

Fall Classes Begin:	Wednesday August 31
University Closed:	Monday Sept 5 (Labor Day Holiday)
No classes:	Monday Oct 24 – Tuesday Oct 25 (Fall break)
University Closed:	Thursday Nov 24 – Friday Nov 25 (Thanksgiving Holiday)
Fall Classes End:	Friday Dec 9
Final exam:	Wednesday December 14, 10:00 AM – 12:00 PM (both sections)

## 5. INSTRUCTORS, TOPICS, AND CONTACT INFORMATION:

**Course Coordinators: Lori Seischab, Ph.D (she/her) and Nara Parameswaran, Ph.D. (he/him)**

For general course related issues contact the Course Coordinators by email at [psl450@msu.edu](mailto:psl450@msu.edu).

**Co-instructors (for individual section related questions including office hours, email respective instructors directly):**

- Nara Parameswaran, Ph.D. (he/him): Inflammatory diseases. Email: [narap@msu.edu](mailto:narap@msu.edu)
- Karl Olson, Ph.D. (he/him): Metabolic Diseases. Email: [olsonla@msu.edu](mailto:olsonla@msu.edu)
- Shane Crandall, Ph.D. (he/him): Epilepsy. Email: [cranda86@msu.edu](mailto:cranda86@msu.edu)

- Jason Bazil, Ph.D. (he/him): Heart Failure. Email: [jnbazil@msu.edu](mailto:jnbazil@msu.edu)

**Assistant Instructor (i.e, Teaching assistant):** Gokul Murali, B.S. (he/him; [muraligo@msu.edu](mailto:muraligo@msu.edu)). Contact Gokul regarding technical aspects of D2L and Google docs, and his office hours. The Assistant instructor will also be in class along with the instructor to answer questions while students are working on their team Research Box assignments. In addition, the Assistant Instructor will help instructors grade Research Boxes.

#### 6. CLASS ATTENDANCE AND PARTICIPATION:

Regular attendance for in-person class is expected and required. Because in-person class is primarily teamwork and discussion, it 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, their course grade will be calculated out of fewer total points. To be considered for an excused absence, students are expected to email the coordinators at [psl450@msu.edu](mailto:psl450@msu.edu) prior to the class with proper 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, papers for Research Box discussions) and quizzes 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](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, quizzes, papers for discussion, etc. You will submit all assignments via D2L. Each section will meet in person once per week (section 001 on Tuesdays and section 002 on Thursdays) to work on the Research Box 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](mailto:ithelp@msu.edu)

## 10. COURSE POLICIES

### 10A. Learning Continuity Statement:

If you become unable to attend class for an extended time due to COVID-19 related circumstances:

- You are expected to e-mail the coordinators ([psl450@msu.edu](mailto: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 VISA to Drs. Seischab and Parameswaran ([psl450@msu.edu](mailto: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.

## 11. GRADING POLICY

### 11A. Grade Dissemination:

The grades for different sections will be posted in the D2L Gradebook.

### 11B. Graded Course Activities:

This course will be graded based on 400 points, as detailed below:

Course element	Description	Points Available	Percentage
Research Box**	8 classes (20 points/class)	160	40%
D2L quizzes	8 quizzes (10 points/quiz)	80	20%
Team project and presentation**	Project progress (4 checkpoints)	12	3%
	Final slides	40	10%
	Video presentation	28	7%
Final Exam	Data skills test	80	20%
<b>Total Points</b>		<b>400</b>	<b>100%</b>

\*\*For specific and detailed information on Research box and Project development go to the respective documents provided separately.

#### *Research boxes*

If it helps a student's course grade, we will drop their lowest week of Research Box grades. Consequently, the student's course grade will be calculated out of fewer than 400 points.

#### *D2L quizzes*

D2L quizzes will assess your understanding of material covered in the online lectures. There are no make-up quizzes. These quizzes will be available for ~1 week for the students to take. If you miss the quiz due to a serious health issue (or such reasons) contact the coordinators with documentation. Others who miss a quiz will receive a 0.

### *D2L quizzes & academic integrity*

Students must work individually on D2L quizzes. No collaboration between students or other parties is allowed. If the course coordinators suspect collaboration or other forms of academic dishonesty, they will arrange a meeting with each student to discuss the potential penalty grade and the Academic Dishonesty Report.

### *Final exam*

The final exam will require you to analyze and interpret experimental data similar to the ones discussed throughout the semester in the 4 different modules. Students with a legitimate emergency, such as illness, will be permitted to take a make-up final 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](mailto: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 FINAL EXAM, as any communication that occurs during an exam is inappropriate and may unfairly advantage some students over others. 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](mailto: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.

### *11C. Grading Policy:*

This course will be graded based on 400 points as noted above (unless the student had an excused absence). There are no other provisions for extra credit, or hardship points. Students with point totals representing 90%, 80%, 70%, and 60% of the available points are assured of receiving minimum grades of at least 4.0, 3.0, 2.0, and 1.0, respectively. Final grades (4.0, 3.5 etc.) will be determined by the percentage of points earned out of the 400 possible points (unless the student had an excused absence). 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](mailto:psl450@msu.edu)) within one week after the beginning of the semester following completion of the course, according to university guidelines.

#### 11D. Final Grade Assignment (PROVISIONAL GRADING SCALE):

The table below describes the relationships between final grades\*\* and cumulative points.

Final Grade	Cumulative Points	Percentage
4.0	360 to 400	90% to 100%
3.5	340 to 359.5	85% to 89.9%
3.0	320 to 339.5	80% to 84.9%
2.5	300 to 319.5	75% to 79.9%
2.0	280 to 299.5	70% to 74.9%
1.5	260 to 279.5	65% to 69.9%
1.0	240 to 259.5	60% to 64.9%
0.0	Below 240	Below 60%

*\*\* Course faculty reserve the right to relax the final grade cut-offs depending on the resulting distribution of student scores, however the cut-offs will not be raised compared to the table shown above.*

#### 11E. Grade Dissemination:

All scores will be posted in D2L. Final course grades will be reported through the Office of the Registrar. Email the coordinators ([psl450@msu.edu](mailto:psl450@msu.edu)) if you wish to discuss your performance in the course or your grade in general. If you wish to discuss content-related questions you should contact the instructor who presented the relevant content.

#### 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 SIRS Online 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 SIRS Online by clicking on the [SIRS link](#). Students will be required to complete the SIRS Online form or to indicate within the form that they decline to participate. Otherwise, final grades may be sequestered for several days following the deadline for submission of course grades. 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 2022), 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>

## Calendars for Online lecture, Quiz, In-person meetings, and Project progress:

### Calendar for Section 001 (Tuesday)

Class #	Topic	Online lecture & Quiz due date (Tues at noon)	In-person class & Research Box date (Tuesday)	Instructor
1	Introduction	N/A	Sept 6, 2022	Seischab
2	Research box practice 1	Sept 13, 2022	Sept 13, 2022	Parameswaran
3	Research box practice 2	Sept 20, 2022	Sept 20, 2022	Parameswaran
4	Inflammatory diseases 1	Sept 27, 2022	Sept 27, 2022	Parameswaran
5	Inflammatory diseases 2	Oct 4, 2022	Oct 4, 2022	Parameswaran
6	Heart Failure 1	Oct 11, 2022	Oct 11, 2022	Bazil
7	Heart Failure 2	Oct 18, 2022	Oct 18, 2022	Bazil
<b>No class - Break</b>			<b>Oct 25, 2022</b>	
8	Metabolic disease 1	Nov 1, 2022	Nov 1, 2022	Olson
9	Metabolic disease 2	Nov 8, 2022	Nov 8, 2022	Olson
10	Epilepsy 1	Nov 15, 2022	Nov 15, 2022	Crandall
<b>No class - Break</b>			<b>Nov 22, 2022</b>	
11	Epilepsy 2	Nov 29, 2022	Nov 29, 2022	Crandall

Class #	Activity	In-person date	Instructor
12	Review	Dec 6, 2022	Parameswaran/ Seischab
13	FINAL EXAM in person	<b>Wednesday</b> Dec 14, 10AM–12PM	Parameswaran/ Seischab

### Due dates for Team Project assignments

Due Dates (Fridays at 11:59 PM)	Project checkpoints
	One team member should submit the required document (i.e. Project Topic Form, Draft Slides 1-5)
Sept 23	Selection of the <b>broad topic</b> , one Nature Reviews* article, and one Nature Reviews Disease Primer article. * Nature Reviews Immunology, Nature Reviews Endocrinology, Nature Reviews Neuroscience, or Nature Reviews Drug Discovery.
Oct 7	Draft of 1 <b>pathophysiology slide</b> containing at least one diagram created by the team.
Oct 21	Draft of 3 <b>research studies slides</b> – 1 per research article.
Nov 11	Draft of the <b>advances in the field slide</b> containing at least one diagram created by the team.
Dec 2	Final version of the <b>5-slide presentation</b> , with a <b>5-minute recording</b>

## Calendars for Online lecture, Quiz, In-person meetings, and Project progress:

### *Calendar for Section 002 (Thursday)*

Class #	Topic	Online lecture & Quiz due date (Tues at noon)	In-person class & Research Box date (Thursday)	Instructor
1	Introduction	N/A	Sept 1, 2022	Seischab
<b>No class - Break</b>		<b>Sept 8, 2022</b>		
2	Research box practice 1	Sept 13, 2022	Sept 15, 2022	Parameswaran
3	Research box practice 2	Sept 20, 2022	Sept 22, 2022	Parameswaran
4	Inflammatory diseases 1	Sept 27, 2022	Sept 29, 2022	Parameswaran
5	Inflammatory diseases 2	Oct 4, 2022	Oct 6, 2022	Parameswaran
6	Heart Failure 1	Oct 11, 2022	Oct 13, 2022	Bazil
7	Heart Failure 2	Oct 18, 2022	Oct 20, 2022	Bazil
<b>No class - Break</b>		<b>Oct 27, 2022</b>		
8	Metabolic disease 1	Nov 1, 2022	Nov 3, 2022	Olson
9	Metabolic disease 2	Nov 8, 2022	Nov 10, 2022	Olson
10	Epilepsy 1	Nov 15, 2022	Nov 17, 2022	Crandall
<b>No class - Break</b>		<b>Nov 24, 2022</b>		
11	Epilepsy 2	Nov 29, 2022	Dec 1, 2022	Crandall

Class #	Activity	In-person date	Instructor
12	Review	Dec 8, 2022	Parameswaran/ Seischab
13	FINAL EXAM in person	<b>Wednesday</b> Dec 14, 10AM–12PM	Parameswaran/ Seischab

### Due dates for project progress assignments

Due Dates (Fridays at 11:59 PM)	Project checkpoints
	<u>One team member</u> should submit the required document (i.e. Project Topic Form, Draft Slides 1-5)
Sept 23	Selection of the <b>broad topic</b> , one Nature Reviews* article, and one Nature Reviews Disease Primer article. * Nature Reviews Immunology, Nature Reviews Endocrinology, Nature Reviews Neuroscience, or Nature Reviews Drug Discovery.
Oct 7	Draft of 1 <b>pathophysiology slide</b> containing at least one diagram created by the team.
Oct 21	Draft of 3 <b>research studies slides</b> – 1 per research article.
Nov 11	Draft of the <b>advances in the field slide</b> containing at least one diagram created by the team.
Dec 2	Final version of the <b>5-slide presentation</b> , with a <b>5-minute recording</b>