

Department of Physiology

Introduction to Physiology PSL250 - Spring 2025 Syllabus

Credit Hours: 4

Course Modality: Face-to-face

Course meeting days and times: Tuesday and Thursday from 12:40pm - 2:30pm

Course location: [E100 Veterinary Medical Center](#)

Instructor: Dr. Theodore Towse, Ph.D., he/him/his

Office: 2174 BPS

Office Hours: Tue 3PM - 5PM, or by appointment.

Email: towsethe@msu.edu

Office Phone: 884-5154

When contacting me directly, email is my preferred means of communication. When emailing **anyone** on the teaching team please put “**PSL250**” in the subject line and use your MSU assigned email account so we can prioritize your email and avoid the university’s SPAM filters. Lastly, although we will try to respond to your email as quickly as possible, allow at least 1 business day for us to respond. Note: if you have a question about the course that is not of a personal nature, please first post it to the **discussion board before emailing any of the teaching team** as one of your fellow students may know the answer and everyone on the discussion board can benefit from the knowledge. In fact, if you email me a question the first thing I will ask you is “did you post your question to the discussion board?”

Contact information and office hours for the ULAs will be posted on D2L when their schedule has been finalized.

Face-to-face office hours are held in room 2240B of the Biomedical and Physical Sciences Building. If a ULA also offers office hours over Zoom it will be noted on D2L.

Course Information

Physiology is the study of the function, regulation, and integration of organs and organ systems of higher animals emphasizing human physiology. In this course we will explore core concepts in physiology and apply these concepts to everyday life including exercise, aging, and pathology.

Course Modality

1. Twice weekly lectures (face-to-face) in [E100 Veterinary Medical Center](#).
2. Lecture slides will be posted on D2L prior to lecture.
3. All exams will be in-person, starting at the regularly scheduled class time.
4. In the event the university requires remote learning, PSL250 will be run asynchronously with content and assessments delivered on D2L and Connect.

Required Textbook & Course Materials

- Option 1: Anatomy & Physiology: An Integrative Approach, 4ed. ISBN 9781265749170. Looseleaf/Connect Combo with online eBook access. You can purchase this option at the

Spartan Bookstore, or the **Student Bookstore** located at 421 East Grand River Avenue.

- Option2: Anatomy & Physiology: An Integrative Approach, 4ed. ISBN 9781265749170. eBook/Connect Combo (no physical textbook). You can also purchase the course material through McGraw-Hill Connect by way of the link provided on D2L click on the link labeled '**Register Now**' located in the 'Start Here' folder on the course D2L page.

Required Technologies

- A laptop computer with a functioning web camera and microphone are required for this course. For additional information about MSU's laptop requirement please click on the following link [MSU's laptop requirement](#). Any questions or concerns about these requirements should be referred to the teaching team. You may contact [MSU technology](#) for technical assistance from 7am to midnight any day the university is open.
- All practice assignments including SmartBook reading assignments, end of chapter homework questions, practice quizzes and Virtual Labs will be deployed through a link in D2L.

Course Policies

Learning Continuity Statement

If you are unable to participate in class for an extended period-of-time:

- You are expected to contact your instructor as soon as you are able.
- In most cases the regular course policies related to grading and assignments will apply.
- In extraordinary cases, with appropriate documentation, we will work with students to develop an appropriate plan of action for successful completion of the course.

Course Continuity Statement

In the unlikely event your instructor is unable to participate in the course for an extended period:

- An announcement and a contingency plan will be posted on the course D2L website.

Prerequisites

- N/A

Course Platform/Structure

This course will be delivered in a traditional face-to-face format. The class meets on Tuesday and Thursday from 12:40PM - 2:30PM. All exams will be administered face-to-face starting at the regularly scheduled course meeting dates and times. The final exam is on Wednesday April 30th from 10:00AM – 12:00PM in E100 Vet. Med.

Technical Assistance

For your convenience the web addresses and phone numbers for course related technical assistance are provided below.

- Contact McGraw-Hill Connect at 1-800-331-5094 or online at [McGraw-Hill Connect](#)
- 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
- [Browser/mobile support for D2L](#).
- [Guide for internet speed](#). For this course, 25 Mbps should work.

Instructional Objectives

Course Objectives: After successfully completing PSL250, students will be able to explain the following “core concepts in physiology”:

1. **Scientific Reasoning:** Physiology is a science. Our understanding of the body arises from the application of the scientific method; thus, our understanding is always tentative.
2. **Causality:** The function of living organisms can be explained by a description of the cause-and-effect relationships that are present.
3. **Homeostasis:** The internal environment of the organism is actively maintained constant by the function of cells, tissues, and organs organized into negative feedback systems.
4. **Structure/Function:** The function of a cell, tissue, organ is determined by its form. Structure and function (from the molecular level to the organ system level) are intrinsically related to each other.
5. **Levels of organization:** An understanding of physiological functions requires understanding the behavior at every level of organization from molecular to whole organism.
6. **Cell membrane:** The plasma membrane of cells is a complex structure that determines what substances enter or leave the cell. Cell membranes are essential for cell signaling and transport.
7. **Cell-to-cell communication:** The function of an organism requires that cells pass information to one another to coordinate their activities. These communication processes include neural and endocrine signaling.
8. **Cell theory:** Cells have many common functions but also many specialized functions that are required by the organism.
9. **Flow down gradients:** The transport of “stuff” (ions, molecules, blood, and gas) is a central process at all levels of organization of the organism and this simple model describes such transport.
10. **Interdependence:** Cells, tissue, organs, and organ systems interact with one another (are dependent on the function of one another) to sustain life.

The “Core Concepts in Physiology” are adapted from: Michael J, McFarland J. The core principles (“big ideas”) of physiology: results of faculty surveys. *Adv Physiol Educ.* 2011 Dec; 35(4):336-41. doi: 10.1152/advan.00004.2011.

Graded Assignments: The only graded assignments for this course are the 6 exams. The first 5 exams are worth 100 points each. The 6th exam includes Module 6 content plus a cumulative final exam and will be administered as a single exam during the final exam period. The 6th exam is worth 120 points. The Module 6 portion of the exam is worth 60 points while the cumulative portion of the exam is worth 60 points. The cumulative portion of the exam will include 30 questions from Modules 1 – 5 materials. All exam dates and times are listed below.

Exam Schedule

Exam	Date and Time	Lectures Covered
Module 1	Tuesday, January 28, 12:40PM - 1:40PM,	Lectures 1 - 4
Module 2	Tuesday, February 18, 12:40PM - 1:40PM,	Lectures 5 - 7
Module 3	Tuesday, March 18, 12:40PM - 1:40PM,	Lectures 8 - 11
Module 4	Tuesday, April 1, 12:40PM - 1:40PM,	Lectures 12 - 16
Module 5	Tuesday, April 15, 12:40PM - 1:40PM,	Lectures 17 - 20
Module 6 + Final Exam*	Wednesday April 30th, 10AM – 11:20AM	Lectures 21 – 23*

SmartBook reading assignments: SmartBook uses a digital version of your textbook with embedded questions carefully curated to reflect the topics most relevant to this course and the material covered in lecture. SmartBook assignments are designed to be active reading assignments and can last anywhere from 30 to 45 minutes. Although there is a tentative due date for these assignments – set based on the exam date – they can be completed at any time before the end of the semester. These assignments are *optional*.

Homework Assignments: After completing the reading, you can complete the end-of-chapter homework assignments which consist of 10-20 questions from the reading designed to reflect the topics most relevant to this course and the material covered in lecture. Although there is a tentative due date for these assignments – set based on the exam date – they can be completed at any time before the end of the semester. These assignments are *optional*.

Extra Credit Assignments: There will be 20 extra credit assignments available during the semester in the form of **Virtual Laboratory** assignments. Each assignment is worth one extra credit point. These links to these assignments will be posted on D2L throughout the semester and are completed through McGraw-Hill Connect. All extra credit assignments are due on Monday April 28th at 11:59PM. Late extra credit assignments will not be accepted under any circumstances. These assignments are *optional*.

Course Outline/Schedule

The table below shows the **tentative schedule** for PSL250 Spring 2025. Column 1 shows the week's class meeting dates while column 2 lists, in chronological order, the topic(s) covered, or Module exam. Note if changes to the schedule are needed, they will be posted on the course D2L website.

Week	Topic, Assignments, and Assessments
1 1/14, 1/16	Syllabus Review (brief), Chapter 1 (1.1, 1.4 - 1.7): Homeostasis Chapter 2 (2.2, 2.5, 2.7): Acidic and Basic Solutions, Biological Macromolecules
2 1/21, 1/23	Chapter 3: (3.1, 3.2, 3.4) Energy and Cellular Respiration Chapter 4 (4.1 - 4.3): Biology of the Cell
3 1/28, 1/30	Module 1 Exam (1/28, exam will start @ 12:40PM, Lectures 1 - 4) Chapter 4 (4.4): Biology of the Cell, Chapter 6 (6.1 - 6.2): Integumentary System
4 2/4, 2/6	Chapter 6: (6.3) Integumentary System, Chapter 10: (10.1 - 10.2) Muscle Tissue Chapter 10: (10.3 - 10.6) Muscle Tissue
5 2/11, 2/13	Chapter 12 (12.1, 12.2, 12.7-12.9) Nervous: Nervous Tissue No Class on 2/13
6 2/18, 2/20	Module 2 Exam (2/18, exam will start @ 12:40PM, Lectures 5 - 8) Chapter 13 (13.1 - 13.6) Nervous System: Brain
7 2/25, 2/27	Chapter 15: (15.1 - 15.6) Autonomic Nervous System Chapter 16: (16.1 - 16.3) Nervous System: Senses
8 3/4, 3/6	No Class Spring Break
9 3/11, 3/13	Chapter 17: (17.1 - 17.6) Endocrine System Chapter 17: (17.7 - 17.10) Endocrine System
10 3/18, 3/20	Module 3 Exam (3/18, exam will start @ 12:40PM, Lectures 9 - 13) Chapter 18: (18.1 - 18.3) Cardiovascular System Blood, Chapter 19: (19.1) Cardiovascular System Heart
11 3/25 - 3/27	Chapter 19: (19.3, 19.5) Cardiovascular System Heart Chapter 19: (19.8, 19.9) Cardiovascular System Heart
12 4/1, 4/3	Module 4 Exam (4/1, exam will start @ 12:40PM, Lectures 14- 16) Chapter 20: (20.1, 20.2, 20.5) Cardiovascular System Vessels and Circulation
13 4/8, 4/10	Chapter 23: (23.1 - 23.4) Respiratory System Chapter 23: (23.5 - 23.8) Respiratory System
14 4/15, 4/17	Module 5 Exam (4/15, exam will start @ 12:40PM, Lectures 17 - 19) Chapter 24: 24.1 - 24.5, 24.8) Urinary System
15 4/22, 4/24	Chapter 26 (26.1 - 26.3) Digestive System Chapter 26 (26.3 - 26.4) Digestive System
Final Exam Week	*Final Exam: April 30th 10:00AM - 11:20PM Module 6 (Lectures 20 - 23 + Cumulative Portion covering Modules 1 - 5)

Grading Policy

[MSU Final Exam Policy](#): No student should be required to take more than two examinations during any one day of the final examination period. Students who have more than two examinations scheduled during one calendar day during the final examination period may contact the Academic Student Affairs Office in their colleges for assistance in arranging for an alternate time for one of the three examinations.

Graded Course Activities

Listed below are graded course activities and associated points.

Assessments	Points
Module 1 Exam	100
Module 2 Exam	100
Module 3 Exam	100
Module 4 Exam	100
Module 5 Exam	100
Final Exam (Module 6 Material + Cumulative Portion)	120
Total Points Possible**	520

Exams Policies:

- All exams will be administered face-to-face at start at the normal time.
- You can drop your lowest exam grade from Modules 1 – 5.
- The Module 6 Exam will include 30 questions (60 points) from Module 6 material and 30 questions (60 points) from material covered in Modules 1 - 5. The specific learning objectives you will be tested on for the cumulative portion of the final exam will be made available to you two weeks prior to the final exam.
- **Total points reflect the highest possible point total after the lowest exam grade from Modules 1-5 has been dropped.
- You **cannot** drop the final exam.

Missed Exams:

- A missed exam will be entered as a “o” in the grade book. A make-up exam will only be granted under **extenuating circumstances** such as a legitimate health emergency that requires medical attention (serious illness, not a cold) or other serious extenuating circumstances (refer to grievance policy below).
- Documentation of the emergency **must be provided** by a physician on their letterhead, with their physical signature and contact information. Please send the documentation attached as a PDF document when you email Dr. Towse about your absence.
- A back-dated doctor’s notes for an illness they did not personally evaluate you for during the period in question will not be accepted as legitimate.
- Dr. Towse reserves the right to contact the physician regarding the illness/condition.

- Forgetting there was an exam is not considered an extenuating circumstance. Leaving early for Fall/Spring break or at the end of the semester does not qualify as an extenuating circumstance – no matter how much notice you provide.
- A picture of your positive COVID test is not considered documentation.
- If you unexpectedly miss an exam, you must contact Dr. Towse within 24 hours of the exam. If you do not contact Dr. Towse within 24 hours you will not be allowed to take a makeup exam.
- Note: the make-up exam **will not** be the same as the exam given during the normal exam period. Although the exam will be over the same content the questions and format of the exam may be different.
- Any make-up exams must be taken within **one week** of the original exam date.
- **From the Office of the Registrar:** ‘A student absent from the final examination without a satisfactory explanation will receive a grade of 0.0 on the numerical system, NC on the CR-NC system, or N in the case of a course authorized for grading on the P-N system. Students unable to take a final examination because of illness or other reasons over which they have no control should notify the associate deans of their colleges immediately.’

Grade Assignment (Grading Scale)

The table below shows the relationship between the percentages of points earned in the course and the assigned grade on a 4.0 scale. Final grades will be assigned according to this grading scale consistent with the MSU grading policies. Under no circumstances will grades be rounded up. For example, a grade of 69.99% is a 1.5 while a grade of 70 is a 2.0. To determine the number of points you need to earn the grade you desire simply multiple the desired grade as a decimal x the total points e.g. 90% = 90/100 or .9 x 520 = 468, 90% of 520 is 468. To earn a 4.0 in this course you need to earn 468 points.

Percentage of Points Earned	Assigned Grade
90% or above	4.0
85.0 to 89.99%	3.5
80.00 to 84.99%	3.0
75.00 to 79.99%	2.5
70 to 74.99%	2.0
65 to 69.99%	1.5
60 to 64.99%	1.0
0 to 59.99%	0

Final Grade Dissemination

All grades will be posted to D2L in a timely manner. Note: if you wish to challenge a grade you’ve earned on one of your assessments you need to email Dr. Towse no later than **one week** after the due date for that assessment. Failure to challenge your grade by this timeline indicates you accept your grades/scores as posted in D2L.

Other Course Policies

Accommodations for COVID-19 and other Serious Health Conditions

COVID-19: If you have been sick with COVID-19 [symptoms](#), have tested positive for COVID-19, or have been potentially [exposed](#) to someone with COVID-19 please follow CDC guidance to [self-isolate or stay home](#). Accommodations will be made for any student who must miss class due to COVID-19 illness or self-isolation so that it will not harm their performance or put them at a disadvantage in the class. Please note that appropriate documentation - as outlined above - must be provided if an exam is missed due to COVID-19 or other illness.

Other Serious Health Conditions: Contact Dr. Towse as soon as possible to discuss potential accommodations.

Attendance Policy

Attendance is required but will not be documented.

Participation Policy

Your participation in the lecture is strongly encouraged. I suggest you ask and answer questions, post questions to the discussion board and generally stay engaged. You will get out of this course as much as you put into it.

Technology and Media

- Please post all content or course related questions that are not of a private nature to the course discussion board on D2L. If your question is of a personal nature, please feel free to email Dr. Towse or any member of the teaching team.
- Cellphone/Smartphone Usage: please do not use your phone in class. If you must take/make a call or receive a message, take a second to step out in the hallway and return when you are ready to re-engage in the class. If you know you will need to take a call, please inform me ahead of time and step out of the classroom to take your call.
- D2L: will serve as the course website and can be found @ d2l.msu.edu. Once there, log in using your MSU NetID and password. After logging in, you will see a link to the specific webpage for this course. If you do not see this link, search for the course, and then pin it to your main page or check with the Office of the Registrar to make sure that you are officially enrolled in the course and D2L. Please note that I do not have the administrative clearance to enroll students in my D2L course. The Office of the Registrar controls your enrollment in the course and D2L.
- All course materials (e.g., syllabus, lecture slides, assessments) will be posted on D2L. The information will be made available to you in Modules. After the Module 1 exam has been completed Module 2 material will be made available, and so on.

Course Lecture Recordings, Intellectual Property and Social Media Use

- Lectures may be recorded and made available on the D2L course site. Recorded lectures are not intended to replace regular attendance but are considered a supplement to the classroom experience.
- Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures.
- Recordings may not be reproduced, shared with those not in the class, or uploaded to other online environments. Doing so may result in disciplinary action.

Institutional Data Policy

<https://tech.msu.edu/about/guidelines-policies/msu-institutional-data-policy/>

Student Privacy Guidelines and Notification of Rights under FERPA

<https://reg.msu.edu/ROInfo/Notices/PrivacyGuidelines.aspx>

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

- Students may not record lectures or other classroom activities without the advance written permission of the course instructor and, if applicable, any students whose voice or image is included in the recordings.
- If a recording is made, students may not share the recordings with other students enrolled in the class. Sharing is limited to using the recordings only for their own course-related purposes.
- *Video and audio recordings made of online lectures may contain inaudible or invisible watermarks to identify shared media:* <https://support.zoom.us/hc/en-us/articles/360021839031-Audio-Watermark>
- 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.
- Any student violating the conditions described above may face academic disciplinary sanctions.

Student Policies and Expectations

The All-University Policy on Integrity Of Scholarship and Grades

All participants in this class are held to the standard set by MSU's Policy on Integrity of Scholarship and Grades. The policy can be read in full at the [MSU Ombudsperson's website](#).

I have no tolerance for cheating. If you are suspected of cheating on an exam a formal complaint will be filed with the MSU Office of Student Support and Accountability. Disciplinary action may include one of the following: retaking a revised version of the exam

which may be an essay or oral exam, receiving a grade of zero on the exam, or failure of the course.

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.”

Disability Access

“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 at 517-884-RCPD or on the web at rcpd.msu.edu. Once your eligibility for an accommodation has been determined, you will be issued a verified individual services accommodation (“VISA”) form. Please present this form to me at the start of the term and/or two weeks prior to the accommodation date (test, project, etc.). Requests received after this date will be honored whenever possible.”

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.

Expected Hours of Participation/Work Outside Class Per Week

Expect to study at least 2-3 hours outside of class for every 1 hour of time you spend in class. Therefore, with approximately 4 hours of in-class time per week you should aim to spend about 8-12 hours outside of class studying for this class. Note, individual differences may exist as some students may need to study more or less to achieve their desired goals in the course.

Grief Absences and Mental Health

If you experience the death of a family member or emotional distress from a similar tragedy, refer to [MSU’s Grief Absence Policy](#). A Grief Absence Request Form is available on this [Student Resources](#) page and is located on the left right side of the page under the “Other Links menu”.

For resources related to Mental Health please see: [Mental Health](#).

Professionalism Policy

“MSU strives to build an academic community with living and learning environments that expects tolerance of viewpoints and civility toward others, whether at public forums, athletic events, in residential communities, classrooms or laboratories.”

‘We call upon all who participate in university events to promote tolerance and civil behavior and to hold themselves to high standards that reflect the university’s commitment to respect viewpoints that may be different from their own. Only by respecting individuals with diverse perspectives and ideas can we build an environment of civility that is conducive to advancing knowledge and transforming lives.’

Student Rights and Responsibilities

Students have a range of support and information options available to them to discuss actions or activities related to their academic, personal or professional lives at MSU. These rights and resources are detailed on the [ombudsperson’s website](#).

Limits to Faculty/Student Confidentiality; Mandatory Reporting

MSU Policy on Relationship Violence and Sexual Misconduct.

Available on the [RVSM website](#).

[RVSM Limits to Confidentiality](#)

Religious Observances

Below you will find key elements of MSU’s Religious Observance Policy while the policy in its entirety can be found here [Religious Observance Policy](#).

Michigan State University is a home for a vibrant, diverse, and multicultural community of students, faculty, and staff, and we value and actively support that diversity, including the diversity of spiritual expression and practice. Therefore, it is the policy of the University to enable students and faculty to observe those days set aside by their chosen religious faith. As Michigan State University has become increasingly multicultural, the incidence of conflicts between mandatory academic requirements and religious observances has increased. In the absence of a simple and dignified way to determine the validity of individual claims, the claim of a religious conflict should be accepted at face value.

It is the responsibility of those students who need to be absent to inform their instructor at least two weeks before the observance day, make arrangements in advance with their instructors, and to catch up on any material discussed and assignments given during that class period. Accommodations must never fundamentally alter an essential requirement of the course or academic program.

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](#).

Pronouns

Please follow posted [MSU guidelines regarding use of pronouns](#).

Emergency Procedures

In the event of an emergency arising within the [classroom/lab], the [Professor, Teaching Assistant (TA), graduate student, instructor, Facilitator] will notify you of what actions that may be required to ensure your safety. It is the responsibility of each student to understand the evacuation, "shelter-in-place," and "secure-in-place" guidelines posted in each facility and to act in a safe manner. You are allowed to maintain cellular devices in a silent mode during this course, in order to receive emergency SMS text, phone or email messages distributed by the university. When anyone receives such a notification or observes an emergency situation, they should immediately bring it to the attention of the [Professor, Teaching Assistant (TA), graduate student, instructor, Facilitator] in a way that causes the least disruption. If an evacuation is ordered, please ensure that you do it in a safe manner and facilitate those around you that may not otherwise be able to safely leave. When these orders are given, you do have the right as a member of this community to follow that order. Also, if a shelter-in-place or secure-in-place is ordered, please seek areas of refuge that are safe depending on the emergency encountered and provide assistance if it is advisable to do so." Prepared by: Captain Penny Fischer Michigan State University Police.

Policies for Student Athletes

See MSU policies on [Student Athletes](#).