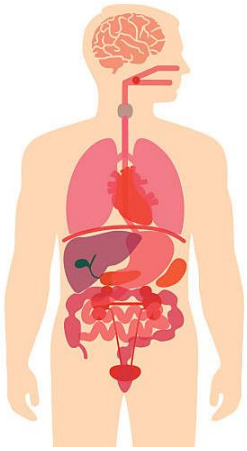
Human Physiology
BIOL 385, Fall 2022



Instructor: Dr. Jennifer Bray
Office: CBB 311
E-Mail: jbray@uwsp.edu
Office Hours: 11:00 – 12:00 on Tuesday, 10:00-12:00 on Wednesday and by appointment ☺

Course Lecture: CBB 101, Monday, Wednesday, and Friday 9:00 – 9:50 am

Recommended Text: "Human Physiology, From Cells to Systems," 9th ed., by Lauralee Sherwood; Brooks/Cole, Cengage Learning, 2016. Available for rent in the bookstore.

Supplemental texts available (these are optional and not required): "Physiology Coloring Book," 2nd ed., 1999, by Wynn Kapit, Robert Macey, and Esmail Meisami; Harper & Row publishers. Used coloring books are available for purchase from the bookstore. New and used coloring books can also be purchased online.

Also suggested is the "Study Guide for Sherwood's Human Physiology: From Cells to Systems," which can be purchased online. An older edition will work just fine or buy a used one. These will be much cheaper!

Additional course information: The course website on Canvas will be used for posting course materials. Course documents will be posted in .pdf format. Also please check your email and the Canvas site often for announcements.

Course Description: Human Physiology is a 4-credit course designed to introduce the study of the normal functions of organ systems in humans. There are three hours of lecture and three hours of lab per week.

Prerequisites: One of the following: BIOL 101, BIOL 111, or BIOL 160; and one of the following: CHEM 101, CHEM 105, or CHEM 117 (or equivalent).

Course Learning Objectives: Upon completion of this course, the student will be able to describe the current understanding of:

1. Understand and describe the basic physiological principles of cells, tissues, organs, and organ systems.
2. Recognize and explain the principle of homeostasis and the use of feedback loops to control physiological systems in the human body.
3. Explain how physiological systems are integrated and identify physiological tradeoffs.
4. Demonstrate proficiency in the methods and philosophy of science, including articulation and application of the scientific method, collection and analysis of biological data, and application of professional ethics.
5. Articulate the application of biological science to meeting the needs of society.

Last day to drop the course: Friday, November 11th (A "W" will appear on your transcript.)

Lecture Slides: Lecture PowerPoint presentations will be made available to registered students through the course link in Canvas. Please note that lectures are only guaranteed to appear online **after** each lecture is given, and students must recognize the content of these files **cannot** replace regular class attendance.

Please note, that lecture materials and recordings for Human Physiology, Biology 385, are protected intellectual property at UW-Stevens Point. Students in this course may use the materials and recordings for their personal use related to participation in this class. Students may take notes solely for their personal use. Students may not copy or share lecture 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 written permission. Unauthorized use of these copyrighted lecture materials and recordings constitutes copyright infringement and may be addressed under the university's policies, UWSP Chapters 14 and 17, governing student academic and non-academic misconduct.

Exams: The lecture examinations will be given during the EVENINGS from **6:00-8:00 PM in CBB 101.** *SEE THE FOLLOWING LECTURE SCHEDULE FOR DATES*. The exams will consist of multiple choice, true and false, and matching questions. The material covered on each exam is shown on the lecture schedule. Alternate exam times will be available to those with job or class conflicts. Make-up exams will be given if pre-arranged or in the case of a *documented* emergency. If you have a prearranged excused absence, such as a UWSP sponsored event, a graduate school interview, or a research conference, etc., I must be informed well before the exam and receive documentation of your absence.

Absences relating to a student's religious beliefs will be accommodated providing the student notifies the instructor regarding the specific dates they will be absent at the beginning of the semester.

Exams are not comprehensive. That said, course material will build over the semester and it will be important for you to remember and apply basic information learned early on to material covered later in the course.

Exam Review: There will be an EXAM REVIEW in **CBB 101, 6:00-7:00 PM** the Tuesday before each exam. See the lecture schedule for dates.

Grade Scale: Exams will be 80% of your final grade, with your lab grade the remaining 20%. Your grade will be based on a straight scale as shown below.

There will be NO negotiation of grades between instructor and students!

GRADE	MINIMUM PERCENT FOR GRADE
A+	97.0%
A	90.0%
A-	86.7%
B+	83.3%
B	80.0%
B-	76.7%
C+	73.3%
C	70.0%
C-	66.7%
D+	63.3%
D	60.0%
F	0.0%

The **A+** designation is called "honorary honors," which does not appear on your transcript, but will be noted in letters of recommendation ☺

Academic Misconduct: Any form of *cheating* on quizzes, exams, or assignments will not be tolerated and will earn a grade of *F (0 points for the quiz, exam, or assignment)*. **No cell phone or smart watch use of any kind will be allowed in the testing room at ANY time before or during the exam.** If a cell phone is out at any point during an exam, the exam will be confiscated immediately, and 0 points will be given. Student grievances are handled per the University of Wisconsin's administrative code, "Student Academic Standards and Disciplinary Procedures," found at http://docs.legis.wisconsin.gov/code/admin_code/uws/14.pdf

Tutoring: The Tutoring-Learning Center (TLC) offers FREE drop-in (CBB 190) and individual tutoring to support you in your STEM classes. The tutors are UWSP students who have done well in their classes and who are here to share their successful study habits and content knowledge to help others succeed. Discussing physiology concepts and processes together clarifies and solidifies knowledge, and the tutors are eager to study with you.

If you have questions or would like to make an appointment, please visit the TLC in 234 CCC (Collins Classroom Center), email (tlctutor@uwsp.edu), or call (715) 346-3568 for information. Please visit the TLC website for the tutoring schedule: https://www3.uwsp.edu/tlc/Pages/default.aspx

TIPS TO DO WELL IN BIOL 385:

- Make a **LIST OF TERMS** from your notes for each lecture and text assignment as a guide for day-to-day study. **RED BOLD** words are key terms and concepts that you will be expected to know for exams.
- **Take notes during lecture: research shows that writing notes by hand increases retention by 50%!**
- **Since Physiology does not lend itself to memorization very well, study the material as soon after each lecture as possible.**
- Participation in a **study group** of three or four students, meeting once a week is **the most effective way to study physiology**. Turn the lecture topics into questions; it is a great way to see how well you know the material.

Academic Integrity: Academic integrity is central to the mission of higher education in general and UWSP in particular. Academic dishonesty (cheating, plagiarism, etc.) is taken very seriously. Don't do it! The minimum penalty for a violation of academic integrity is a failure (zero) for the assignment. For more information, see the UWSP "Student Academic Standards and Disciplinary Procedures" section of the *Rights and Responsibilities* document, Chapter 14, which can be accessed by clicking here.

Disability Resource Center: In compliance with the Americans with Disabilities Act, I will make every effort to honor requests for accommodations made by individuals with disabilities. If you have a disability and require accommodations, please register with the Disability Resource Center (DRC, room 108 in the Collins Classroom Center (CCC), call 715-346-4143, or email drc@uwsp.edu). Requests for accommodation can be responded to most effectively if I receive the requests early in the semester. Such requests are confidential. I am happy to help in any way that I can!

UWSP Community Bill of Rights and Responsibilities: UWSP values a safe, honest, respectful, and inviting learning environment. A set of expectations for students and instructors, known as the Rights and Responsibilities document, is intended to help establish a positive living and learning environment. For more information go to https://www.uwsp.edu/dos/Documents/2015_Aug_Community%20Rights%20and%20Responsibilities%20Web.pdf

Title IX: Under several federal and state laws and according to several university guidelines, I am required to report acts of a criminal or offensive nature. This includes acts of sexual harassment and assault, bias and hate crimes, illicit drug use, and acts of violence. Any disclosure or description of these incidents – both current and in the past – may be reported to the Dean of Students office (http://www.uwsp.edu/dos/) or the local authorities.

BIOLOGY 385: HUMAN PHYSIOLOGY
LECTURE SCHEDULE, FALL 2022

Lecture Number	Date	Topic	Recommended Reading: *Human Physiology*, 9th ed., 2016 by L. Sherwood
1	**Sept. 7**	Course Overview; Introduction to Physiology and Homeostasis	Review Syllabus, Ch. 1 (1-18)
2	**9**	Cell Physiology and Overview of Organelles	Ch. 2 (21-30), *Table 2-2 (45)*
3	**12**	The Plasma Membrane and Cell to Cell Adhesions	Ch. 3 (55-63)
4	**14**	Membrane permeability; passive and active transport; Tonicity	Ch. 3 (63-77), *Table 3-2 (78)*
5	**16**	Neurophysiology I: Membrane Potential, origin of electrical potentials from dissolved ions	Ch. 3 (77-85)
6	**19**	Neurophysiology II: Excitable membranes, depolarization, hyperpolarization, repolarization, and action potentials in neurons	Ch. 4 (87-102)
7	**21**	Neurophysiology III: Action Potentials	Ch. 4 (87-102)
8	**23**	Neurophysiology IV: Synapses	Ch. 4 (102-108)
9	**26**	Neurophysiology V: Finish Chapter 4 / Catch up on Lecture Material	
RVW #1	**27**	**Review #1 Tuesday, Sept 27th 6:00 – 7:00 pm in CBB 101**	**Review Chapters 1-4**
10	**28**	Neuro-muscular Junction (motor end-plate)	Ch. 7.3 (242-248)
EXAM #1	**29**	**EXAM #1, Thursday, Sept 29th, 6:00 -8:00 pm in CBB 101**	**Exam will Cover Chapters 1-4**
11	**30**	Skeletal muscle I: structure and molecules of muscle contraction	Ch. 8 (251-256)
12	**Oct 3**	Skeletal muscle II: calcium-triggering system: the sarcoplasmic reticulum and t-tubule system	Ch. 8 (256-262)
13	**5**	Skeletal muscle III: mechanics, motor nerves and muscle group, motor units and origin of reflexes	Ch. 8 (262-275)
14	**7**	Skeletal muscle IV: muscle metabolism and skeletal muscle types	Ch. 8 (262-275)
15	**10**	Cardiac and smooth muscle	Ch. 8 (286-294), *Table 8.4 (287)*
16	**12**	Overview of the central nervous system (CNS)	Ch. 5 (Tbl 5-1*, refer to slides for pages and figs)
17	**14**	Spinal cord and reflexes, muscle spindles	Ch. 5 (172-178); Ch. 8 (281-286)
18	**17**	The Autonomic Nervous System (ANS)	Ch. 7 (233-241)
19	**19**	Red Blood Cells; anemia and polycythemia	Ch. 11 (380-389)

20	**21**	White blood cells: granulocytes and lymphocytes; Hemostasis	Ch. 11 (392-394), Ch. 11 (395-400)
21	**24**	Immunology: macrophage & lymphocyte function; humoral and cellular immunity	Ch. 12 (see slides for page numbers)
RVW #2	**25**	**Review #2 Tuesday, Oct 25th 6:00 – 7:00 pm in CBB 101**	**Review Lectures 10-21 (nmj – immunology)**
22	**26**	Cardiac Physiology I: heart as a muscular pump; properties of arteries and veins	Ch. 9 (297-303); Ch. 10 (skim 335-365) *Tbl 10-1*
EXAM #2	**27**	**EXAM #2, Thursday, Oct 27th, 6:00 -8:00 pm in CBB 101**	**Will Cover Lectures 10-21 (nmj – immunology)**
23	**28**	Cardiac Physiology II: EKG; blood pressure patterns	Ch. 9 (303-314)
24	**31**	Cardiac Physiology III: the Cardiac Cycle	Ch. 9 (314-318; *Fig 9-16, p.316*)
25	**Nov 2**	Cardiac Physiology IV: Cardiac Output	Ch. 9 (319-325)
26	**4**	Blood flow and blood pressure relationships	Ch. 10 (365-369) (see slides for additional pages)
27	**7**	Pulmonary Physiology I: Respiratory anatomy and mechanics	Ch. 13 (445-465)
28	**9**	Pulmonary Physiology II: Gas exchange and transport	Ch. 13 (466-478)
29	**11**	Pulmonary Physiology III: Chemistry of respiration, Hb and carbonic anhydrase	Ch. 13 (466-478)
30	**14**	Pulmonary Physiology IV: Nervous and chemical control of respiration	Ch. 13 (479-488)
RVW #3	**15**	**Review #3 Tuesday, Nov 15th 6:00 – 7:00 pm in CBB 101**	**Review Chapters 9, 10, and 13**
31	**16**	Renal Physiology I: Regulation of body fluids; gross and micro-anatomy of the kidney	Ch. 14 (491-498)
EXAM #3	**17**	**Exam #3 Thursday, Nov 17th, 6:00 -8:00 pm in CBB 101**	**Exam will Cover Chapters 9,10, and 13**
32	**18**	Renal Physiology II: filtration, GFR	Ch. 14 (498-505)
33	**21**	Renal Physiology III: Tubular reabsorption and secretion, role of the hormones aldosterone and vasopressin in the regulation of water excretion/blood volume	Ch. 14 (505-517)
34	**23**	Renal Physiology IV: urine excretion; counter- current multipliers; fluid and acid-base balance	Ch. 14 (517-527), Ch. 15 (535-563)
	24-27	THANKSGIVING BREAK 😊	
35	**28**	Introduction to endocrinology control systems: the pituitary gland - the "master" endocrine gland	Ch. 18 (638-652; Tbl 18-2 summary, p. 644-645)
36	**30**	The hypothalamus-pituitary team, using the control of the thyroid gland as a model system	Ch. 19 (665-671)
37	**Dec. 2**	The adrenal gland: anatomy, steroid hormones, epinephrine and pituitary control and adrenal diseases	Ch. 19 (672-685)
38	**5**	Regulation of blood glucose: insulin and glucagon	Ch. 19 (685-701)

39	**7**	Diabetes - Type I & II	Ch. 19 (685-701)
40	**9**	Sex determination and sex differentiation	Ch. 20 (715-723)
41	**12**	Male reproductive endocrinology; Spermatogenesis	Ch. 20 (723-732)
42	**14**	Female sex-steroid hormones I: estrogen, progesterone	Ch. 20 (736-749)
Extra lecture	Just in case	Female sex-steroid hormones II: the menstrual cycle and overview of fertilization	Ch. 20 (749-750)
RVW #4	**19**	**Review #4 Monday, Dec 19th 6:00 – 7:00 pm in CBB 101**	**Review Chapters 14, 18, 19, and 20**
EXAM #4	**21**	**Exam #4 Wednesday, Dec 21st 2:45-4:45 pm in CBB 101**	**Exam will Cover Chapters 14,18, 19, and 20**

* Please note: Course schedule and topics covered are subject to change. Please refer to Canvas and the lecture slides for up-to-date information on page numbers and material covered on exams.

BIOLOGY 385 HUMAN PHYSIOLOGY LAB SCHEDULE
FALL SEMESTER 2022

★You will need to buy a LAB MANUAL from the Book Store before your first lab next week!★

Lab Instructors: Dr. Jennifer Bray (CBB 311) and Dr. Michael Steury (CBB 315)

All labs are held in the human physiology teaching laboratory located in **CBB 376**.

Lab Sections:

LAB DAY	SECTION	INSTRUCTOR
MAM (11am - 1:50am)	Section 1	Dr. Bray
TPM (2 pm - 4:50pm)	Section 2	Dr. Bray
WAM (11 am - 1:50pm)	Section 3	Dr. Steury
WPM (2 pm - 4:50pm)	Section 4	Dr. Bray

LAB BEGINNING	*EXPERIMENT DESCRIPTION*
September 6	★ NO LABS FIRST WEEK OF CLASS! ★
September 12	ANATOMY OF THE PRESERVED RAT
September 19	PERMEABILITY: PENETRATION OF SUBSTANCES INTO CELLS
September 26	THE SPECIAL SENSES: HEARING, TOUCH, TASTE & SMELL
October 3	PROPERTIES OF SKELETAL (STRIATED) MUSCLE
October 10	PROPERTIES OF SKELETAL (STRIATED) MUSCLE DATA ANALYSIS
October 17	SPINAL AND SUPRASPINAL REFLEXES
October 24	FORMED ELEMENTS OF THE BLOOD; RBC MEASUREMENTS, IMMUNITY, AND BLOOD TYPING
October 31	HEART ANATOMY AND THE ELECTROCARDIOGRAM
November 7	HEART (VALVE) SOUNDS AND BLOOD PRESSURE
November 14	CAPACITIES OF THE RESPIRATORY SYSTEM
November 21	SMALL-ANIMAL SURGERY PRACTICE AND PREPARATION
November 28	HORMONE-DEPENDENT TISSUE GROWTH, PT. I: OVARIECTOMY OF FEMALE RATS
December 5	THYROID HORMONES AND METABOLISM: SOLVING A HORMONE "UNKNOWN"
December 12	HORMONE-DEPENDENT TISSUE GROWTH, PT II: HORMONE & SURGERY EVALUATION

Lab Grade: The lab grade consists of lab quiz grades, and lab reports. It counts for 20% of the final grade. Think of your lab grade as an extra lecture exam. If you are missing five or more lab reports or other lab assignments, your lab grade will be converted to a zero.

Other Guidance:

- If you are not feeling well or believe you have been exposed to COVID-19, do not come to class; email your instructor and contact Student Health Service (715-346-4646).
    - As with any type of absence, students are expected to communicate their need to be absent and complete the course requirements as outlined in the syllabus.
- Wash your hands or use appropriate hand sanitizer regularly and avoid touching your face.