

**COURSE POLICY FOR BIOLOGY 385: HUMAN PHYSIOLOGY  
FALL SEMESTER, 2018**

Course Description: Normal functions of organ systems in humans. This course fulfills the physiology requirements for biology, human development, nutritional sciences, and physical education majors and is recommended for students with pre-professional interests in medical or allied health fields. Three hours of lecture and three hours of lab per week, 4 credits. **Prerequisites: Biology 160 (zoology) or Biology 101 (general biology) and 1 semester of college Chemistry (101 or 105).**

**Lectures:** Dr. Jennifer Bray  
Office: **CBB 311**, in the new Chemistry-Biology Building  
Phone: (715)346-3569  
Email: jbray@uwsp.edu

**Office hours:** Tuesday and Thursday from 10:00 – 12:00 and by appointment.

**Laboratories:** Held in TNR 253. Instructors: Dr. Jennifer Bray (CBB 311, ext. 3569) and Dr. Michael Steury (CBB 315, ext. 2164). See lab schedule on page 7.

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

**Assigned Text:** "Human Physiology, From Cells to Systems," 9th ed., by Lauralee Sherwood; Brooks/Cole, Cengage Learning, 2016. Available at Text Rental. Think about buying an old edition for your own reference after you take the course.

**Supplemental Texts available:** "Physiology Coloring Book," 2nd ed., 1999, by Wynn Kapit, Robert Macey, and Esmail Meisami; Harper & Row publishers. These 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 at the bookstore or online. An older edition will work just fine or buy a used one. These will be much cheaper!

**Examinations:** The lecture examinations will be given during the EVENINGS from **7:15-9:15 PM in CCC 101**. SEE THE FOLLOWING LECTURE SCHEDULE OR TIMETABLE FOR DATES. The material covered on each exam is shown on the lecture schedule. Alternate exam times will be available to those with certifiable job or class conflicts. Our exams take precedence over evening exams that are not listed in the timetable. Make-up exams will only be given if pre-arranged or in case of a *documented* emergency. There will be an *EXAM REVIEW* in **CCC 101, 7:15-8:15 PM** the Tuesday before each exam. SEE THE LECTURE SCHEDULE FOR DATES.

**Attendance Policy:** Attendance at lectures and laboratories is required.

**Last day to drop the course: Friday, November 9th.** (A "W" will appear on your transcript.)

**Grading Policy:** The examinations and labs will be weighted as follows:

<b>Exams 1-4</b>	<b>80%</b>
<b>Lab grade (total) ★</b>	<b>20%</b>

★ Lab grade consists of quiz grades, lab reports, extra-credit lectures, and attendance.

**Physiology course outcomes:** Upon completion of this course students should be able to

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.

**Grade Scale:** Your grade will be based on a straight scale as shown below. There will be several extra-credit opportunities in lab as well as extra credit lectures. Grading decisions on borderline percentages will be made based on attendance and lab performance. 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 or exams will not be tolerated and will earn a grade of **F (0 points for the quiz or exam)**. **No cell phone 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 exams, 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](http://docs.legis.wisconsin.gov/code/admin_code/uws/14.pdf)

**Clickers:** This class uses "Clickers" to do interactive polling. **You will need to purchase a Turning Technologies code from the bookstore to participate in the class.** You will be required check out a clicker from the UWSP IT Service Desk in room 027 ALB, in the basement of the library. Device checkout is **free of charge**. For service desk hours: <http://www.uwsp.edu/infotech/Pages/HelpDesk/default.aspx>. You will need your UWSP student ID to lease a clicker. Your clicker may be used in any class that requires clickers for the semester. Clickers must be returned to the IT Service Desk before the end of finals. Students with unreturned clickers will be billed a late fee and/or may be billed the replacement cost of the clicker. You will need to create a Turning Technologies account in order to register your device to the class. Please use your UWSP email address to create an account here: <https://account.turningtechnologies.com/account/> .

**Tutoring:** We have several group tutors for the course available to anyone in this class, starting the third week of classes. No sign-up is needed for group tutoring and **all group tutoring is FREE!** One-on-one tutoring as well as free walk-in tutoring is also available. Visit the Tutoring-Learning Center in ALB 018 for all one-on-one tutoring. Tutoring is a bargain and, if pursued consistently, will help a lot! Please visit the TLC website for the tutoring schedule: <http://www.uwsp.edu/tlc/Pages/default.aspx>.

**Lecture Slides:** Lecture PowerPoint presentations (in a condensed format) will be made available to registered students through the course link in *Desire to Learn* (D2L). Please note that lectures are only guaranteed to appear on D2L **after** each lecture is given, and students must recognize the content of these files **cannot** replace regular class attendance. The slides for each exam will remain available on D2L up until the date of the exam, at which point slides and chapter outlines will be removed.

**Suggestions:**

- 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 in 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, 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.

**BIOLOGY 385: HUMAN PHYSIOLOGY  
LECTURE SCHEDULE, FALL SEMESTER 2018**

Dr. Jennifer Bray

Office: CBB 311

Lectures: 9:00-9:50 am, Tues, Thurs, and Fri (Collins Classroom Center 101)

**SUMMARY OF EVENING EXAMS AND REVIEWS:**

**EXAM 1: Thurs, Sept 27, 7:15-9:15 PM, Sections 1-7 CCC 101; (covers material through lecture #10)**

**REVIEW 1, Tues, Sept 25, 7:15-8:15 PM, CCC 101**

**EXAM 2: Thurs, Oct 25, 7:15-9:15 PM, Sections 1-7 CCC 101; (covers material through lecture #20)**

**REVIEW 2, Tues Oct 23, 7:15-8:15 PM, CCC 101**

**EXAM 3: Thur, Nov 15, 7:15-9:15 PM, Sections 1-7 CCC101; (covers material through lecture #29)**

**REVIEW 3, Tues, Nov 13, 7:15-8:15 PM, CCC 101**

**EXAM 4: Thur, Dec 20, 2:45-4:45 pm, Sections 1-7 CCC 101; (covers material through lecture #43)**

**REVIEW 4, Thurs, Dec 13, 7:15-8:15 PM, CCC 101**

Lecture No.	Date	Topic	Recommended Reading: <i>Human Physiology</i> , 9th ed., 2016 by L. Sherwood
		★★ Recommended: review of basic chemistry and physics	Appendix A (A-1 – A-15)
1.	<b>Sept. 4</b>	Course Overview; Introduction to physiology	Review Syllabus
2.	<b>6</b>	Organ systems overview; Cells as physiological systems	Ch. 1 (1-18), Ch. 2 (21-30), *Table 2-2 (45)*
3.	<b>7</b>	Cytoplasm components and plasma membrane	Ch. 3 (55-63)
4.	<b>11</b>	Membrane permeability; passive and active transport; osmosis	Ch. 3 (63-77), *Table 3-2 (78)*
5.	<b>13</b>	Neurophysiology I: Membrane Potential, origin of electrical potentials from dissolved ions	Ch. 3 (77-85)
6.	<b>14</b>	Neurophysiology II: Excitable membranes, depolarization, hyperpolarization, repolarization, and action potentials in neurons	Ch. 4 (87-102)
7.	<b>18</b>	Neurophysiology III: Action Potentials	Ch. 4 (87-102)
8.	<b>20</b>	Neurophysiology IV: Synapses	Ch. 4 (102-108)
9.	<b>21</b>	Neurophysiology V: catch up and review	
10.	<b>25</b>	Neuro-muscular Junction (motor end-plate)	Ch. 7 (242-248)
<b>RWW #1</b>		<b>REVIEW #1, Tues, Sept 25, 7:15-8:15 PM, CCC 101</b>	<b>LECTURES 1-10</b>

===== END OF MATERIAL COVERED ON EXAM #1 =====

11.	<b>27</b>	Skeletal muscle I: structure and molecules of muscle contraction	Ch. 8 (251-256)
<b>EXAM #1</b>		<b>EXAM #1, Thurs, Sept 27, 7:15-9:15 PM, All sections, CCC 101</b>	<b>LECTURES 1-10</b>
12.	<b>28</b>	Skeletal muscle II: calcium-triggering system: the sarcoplasmic reticulum and t-tubule system	Ch. 8 (256-262)
13.	<b>Oct. 2</b>	Skeletal muscle III: mechanics, motor nerves and muscle group, motor units and origin of reflexes; skeletal muscle types	Ch. 8 (262-275)
14.	<b>4</b>	Cardiac and smooth muscle	Ch. 8 (286-294), *Table 8.4 (287)*
15.	<b>5</b>	Overview of the central nervous system (CNS)	Ch. 5 (Tbl 5-1*, refer to slides for pages and figs)
16.	<b>9</b>	Spinal cord and reflexes, muscle spindles	Ch. 5 (172-178); Ch. 8 (281-286)
17.	<b>11</b>	The Autonomic nervous system (ANS)	Ch. 7 (233-241)
18.	<b>12</b>	Red Blood Cells; anemia and polycythemia	Ch. 11 (380-389)
19.	<b>16</b>	White blood cells: granulocytes and lymphocytes; Hemostasis	Ch. 11 (392-394), Ch. 11 (395-400)
20.	<b>18</b>	Immunology: macrophage & lymphocyte function; humoral and cellular immunity	Ch. 12 (see slides on D2L for page numbers)

===== END OF MATERIAL COVERED ON EXAM #2 =====

21.	<b>19</b>	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*
22.	<b>23</b>	Cardiac Physiology II: EKG; blood pressure patterns	Ch. 9 (303-314)
<b>RVW #2</b>		<b>REVIEW #2, Tues, Oct 23, 7:15-8:15 PM, CCC 101</b>	<b>LECTURES 11-20</b>
23.	<b>25</b>	Cardiac Physiology III: the Cardiac Cycle	Ch. 9 (314-318; *Fig 9-16, p.316*)
<b>EXAM #2</b>		<b>EXAM #2, Thurs, Oct 25, 7:15-9:15 PM, All sections, CCC 101</b>	<b>LECTURES 11-20</b>
24.	<b>26</b>	Cardiac Physiology IV: Cardiac Output	Ch. 9 (319-325)
25.	<b>30</b>	Blood flow and blood pressure relationships	Ch. 10 (365-369) (see slides for additional pages)
26.	<b>Nov. 1</b>	Pulmonary Physiology I: Respiratory Anatomy and mechanics	Ch. 13 (445-465)
27.	<b>2</b>	Pulmonary Physiology II: Gas Exchange and transport	Ch. 13 (466-478)
28.	<b>6</b>	Pulmonary Physiology III: Chemistry of respiration, Hb and carbonic anhydrase	Ch. 13 (466-478)
29.	<b>8</b>	Pulmonary Physiology IV: nervous and chemical control of respiration	Ch. 13 (479-488)

===== END OF MATERIAL COVERED ON EXAM #3 =====

30.	9	Renal Physiology I: regulation of body fluids; gross and micro-anatomy of the kidney	Ch. 14 (491-498)
31.	13	Renal Physiology II: filtration, GFR	Ch. 14 (498-505)
<b>RVW #3</b>		<b>REVIEW #3, Tues, Nov 13, 7:15-8:15 PM , CCC 101</b>	<b>LECTURES 21-29</b>
32.	15	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)
<b>EXAM #3</b>		<b>EXAM #3,Thur, Nov 15, 7:15-9:15 PM, All sections, CCC 101</b>	<b>LECTURES 21-29</b>
33.	16	Renal Physiology IV: urine excretion; counter- current multipliers; fluid and acid-base balance	Ch. 14 (517-527), Ch. 15 (535-563)
34.	20	Introduction to endocrinology control systems: the pituitary gland - the "master" endocrine gland	Ch. 18 (638-652; Tbl 18-2 summary, p. 644-645)
35.	27	The hypothalamus-pituitary team, using the control of the thyroid gland as a model system	Ch. 19 (665-671)
36.	29	Adrenal gland I: anatomy, steroid hormones, epinephrine and pituitary control	Ch. 19 (672-685)
37.	30	Steroid hormones of the adrenal gland II: Adrenal diseases: Cushing's syndrome (excess glucocorticoids); Addison's disease (low glucocorticoids) and the adrenogenital syndrome (excess adrenal androgens)	Ch. 19 (672-685)
38.	<b>Dec. 4</b>	Calcium metabolism	Ch. 19 (701-713)
39.	6	Regulation of blood glucose: insulin and diabetes - Type I & II	Ch. 19 (685-701)
40.	7	Sex determination and sex differentiation	Ch. 20 (715-723)
41.	11	Male reproductive endocrinology	Ch. 20 (723-732)
42.	13	Female sex-steroid hormones I: estrogen, progesterone	Ch. 20 (736-749)
43.	14	Female sex-steroid hormones II: the menstrual cycle and overview of fertilization	Ch. 20 (749-750)
<b>RVW #4</b>		<b>REVIEW #4, Thursday, December 13, 7:15-8:15 PM , CCC 101</b>	<b>LECTURES 30-43</b>
<b>EXAM #4</b>		<b>EXAM #4, Thursday, December 20, 2:45-4:45, All sections, CCC 101</b>	<b>LECTURES 30-43</b>

===== END OF MATERIAL COVERED ON EXAM #4 =====

\* Please note: Course schedule and topics covered are subject to change. Please refer to D2L and the lecture slides for up-to-date information on page numbers and material covered on exams.

<b>BIOLOGY 385 HUMAN PHYSIOLOGY LAB SCHEDULE FALL SEMESTER 2018</b>
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**LAB MANUALS ARE AVAILABLE FROM THE BOOKSTORE.  
YOU WILL NEED ONE TO BEGIN LAB NEXT WEEK!**

Instructors: Dr. Jennifer Bray (CBB 311, ext. 3569) and Dr. Michael Steury (CBB 315, ext. 2164)

<b>LAB BEGINNING:</b>	<b>EXPERIMENT DESCRIPTION:</b>	<b>LAB MANUAL PAGES:</b>
September 10	ANATOMY OF THE PRESERVED RAT	19-22
September 17	PERMEABILITY: PENETRATION OF SUBSTANCES INTO CELLS	23-36
September 24	THE SPECIAL SENSES: HEARING, TOUCH, TASTE & SMELL	37-50
October 1	PROPERTIES OF SKELETAL (STRIATED) MUSCLE	51-64
October 8	SPINAL AND SUPRASPINAL REFLEXES	65-78
October 15	FORMED ELEMENTS OF THE BLOOD; RED BLOOD CELL MEASUREMENTS and IMMUNITY AND BLOOD TYPING	79- 94
October 22	HEART ANATOMY AND THE ELECTROCARDIOGRAM	95-108
October 29	HEART (VALVE) SOUNDS AND BLOOD PRESSURE	109-124
November 5	CAPACITIES OF THE RESPIRATORY SYSTEM	125-132
November 12	KIDNEY PHYSIOLOGY: WATER-, ELECTROLYTE- AND pH-BALANCE	133-144
November 19	★ SMALL-ANIMAL SURGERY PRACTICE AND PREPARATION	145-150
November 26	HORMONE-DEPENDENT TISSUE GROWTH, PT. I: GONADECTOMIES OF FEMALE RATS	151-156
December 3	THYROID HORMONES AND METABOLISM: SOLVING A HORMONE "UNKNOWN"	157-162
December 10	HORMONE-DEPENDENT TISSUE GROWTH, PT II: CASTRATION EVALUATION	163-170
December 14 (1:00 – 3:30)	<b>OPTIONAL: TOUR OF ST. MICHAEL'S HOSPITAL</b> (see sample questions in manual). This gives you a chance to hear physiology spoken. Usually includes the following departments: Intensive Care, Clinical Chemistry, Pathology, and Obstetrics & Birthing Center.	171-172

**Lab Sections:**

LAB DAY	SECTION	INSTRUCTOR
MAM (9am-12pm)	Section 1	Dr. Bray
MPM1 (12pm-3pm)	Section 4	CANCELLED
MPM2 (3pm-6pm)	Section 7	Dr. Bray
TAM (11am-2pm)	Section 3	Dr. Steury
TPM (2pm-5pm)	Section 6	Dr. Bray
WAM (8am-11pm)	Section 2	Dr. Steury
WPM (12pm-3pm)	Section 5	Dr. Steury

**Lab Quizzes and Weekly Reviews:** There will be a short lab quiz at the beginning of each lab period covering the results of the last week's lab. Unless there is an excused absence, missed lab quizzes cannot be made up. If you miss a lab you can schedule another lab during the same week with the instructor of that lab. Please notify your lab instructor that you will be attending another lab section. There will be no lab questions on lecture exams.

**Lab Grade:** The lab grade consists of **quiz grades, lab reports, extra-credit lectures, and attendance. It counts for 20% of the final grade.** Think of your lab grade as an extra lecture exam.