

## Human Physiological Systems BIOL 839, Fall 2021

### Instructor

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### Course Description

General human physiology will be studied with an emphasis on systems. The integumentary, skeletal, muscular, nervous, endocrine, circulatory, lymphatic, respiratory, urinary, digestive, immune and reproductive systems will be discussed. Salient mechanical, physical and biochemical processes of organs, tissues and cells will be covered. Anatomy will be included at a level necessary to make sense of the system's function.

### Learning Objectives

1. Students will be able to describe the function of each of the physiological systems.
2. Students will have a basic understanding of homeostasis in a healthy human and be able to explain how a system may contribute to a specific aspect of homeostasis.
3. A fundamental understanding of how cellular form and function ultimately control the activities of physiological processes will be gained.
4. An understanding of the basic principles of chemistry as they apply to physiological processes will be developed.
5. Students will begin the process of understanding how disease relates to disturbances in normal physiological processes (pathophysiology).
6. The understanding of scientific investigations directed at physiology will be enhanced by reading examples from the primary literature.

***RECOMMENDATIONS:** A good course for students with little previous training in human physiology. However, the course will have some activities that dive deep into the nuts and bolts of human physiology, such as the primary literature and fundamental medical applications for physiological concepts. Fundamentals of biochemistry, cell biology and molecular biology are covered (largely to refresh the memory), but a reasonable understanding of these fields (from previous coursework) is expected.*

### Course Materials

Textbook: Most materials will be provided electronically. However, students will need a copy of the Common Reading as follows:

Rebar CR, Heimhartner NM and Gershch CJ. Pathophysiology Made Incredibly Easy! 6<sup>th</sup> Edition, Wolters Kluwer, Philadelphia, 2013 (ISBN 9781496398246).

Students are encouraged to obtain a used copy if available from their favorite online book vendor (mine was about \$27 with free shipping ... but the cost has increased substantially to about \$30-50, search around for the best price).

Also, it is recommended that students obtain a high quality Anatomy and Physiology textbook. Many

good texts are available, but I tend to use the following:

Saladin, K.S., *Anatomy and Physiology: The Unity of Form and Function*, 5th Edition, McGraw Hill, Boston, 2009/2010 (ISBN 978-0-07-352569-3).

I encourage the use of low cost used textbooks (the used 5<sup>th</sup> edition is often available for as little as \$10), but students are free to get newer editions of just about any Anatomy and Physiology text that they wish. If you already own a general A&P textbook, it will almost certainly work fine.

Computer and Software: Access to a computer, modern browser and Internet connection are required for the course. A word processor compatible with the instructor's software is needed for preparation of written assignments.

Digital Imaging Device: Some method of producing digital images may be required for incorporating images into assignments. Good solutions include a flatbed scanner, digital camera, etc. I suggest students do not buy anything, if possible, as a cell phone photo will often be satisfactory for the purpose of this course.

Web Resources: Canvas, an online learning management system (LMS), is used for this course. Students will be responsible for becoming proficient at using the system. Instructions can be found online by searching the eCampus section of the University of Nebraska at Kearney web site. Students will be expected to check the Canvas site often for announcements and assignments. In addition, students are required to use and check the email account assigned to them by the university (Lopermail).

Lecture Video and Provided Study Notes: Lectures are supplied as HTML5 video that will be compatible with a recent Firefox web browser. Support for mobile devices will be hit or miss, but students will be able to download the video if streaming does not work as anticipated. Note that much of the provided material is copyrighted by the authors. *Students should refrain from distributing the resources to others without written permission from the copyright owner(s)*. All links and access to course materials will expire shortly after the last day of class.

**Legal: *The materials on this course website are only for the use of students enrolled in this course for purposes associated with this course and may not be retained or further disseminated. The materials on this course website may be protected by copyright, and any further use of this material may be in violation of federal copyright law.***

## **Grading**

Quizzes: Numerous online quizzes are assigned throughout the semester and must be completed by the due date. Each quiz is multiple choice, fill in the blank, matching, short answer, etc. A time limit will be issued for each quiz, so studying before taking the quiz is advised.

Histology Assignments: Several assignments with emphasis on histology will be completed. Histology assignments are typically composed of questions about histology photographs.

Mini Labs: Small lab-like assignments which either require analysis of data or serve as expanded knowledge activities.

Writing Assignments: Students will evaluate papers from the primary literature and produce short written summaries. Papers are assigned by the instructor.

Exams: Time-limited online exams will be given. *Students will be able to take each exam only once*. Exams will incorporate features suggested by the Human Anatomy and Physiology Society for "Assessment Design and Cheating Risk in On-line Instruction" which mandate time limits and one question at a time formatting. **Exams are closed book.**

Final Exam: Students will be provided access to the final exam approximately one week before

the due date. Late exams will not be accepted.

Point Distribution(tentative): The value of each assignment will be as follows:

<b>Assignment</b>	<b>Points Each</b>	<b>Total Points</b>
Worksheets	13 @ 10 pts	130 pts
Quizzes	15 @ 15 pts	225 pts
Mini-labs	11 @ 10 pts	110 pts
Histology assign.	3 @ 20 pts	60 pts
Mini-papers	2 @ 25 pts	50 pts
Online Exams	3 @ 100 pts	300 pts
Final	1 @ 125 pts	<u>125 pts</u>
	total	1000 pts

The final grade will be determined base on the number of earned points. **Percentages are not used when assigning final letter grades for the course.** In the event that assignments are changed, the scores will be normalized to 1000 pts (points earned / total possible x 1000). Grades will be assigned as follows:

A+ (1000-990), A (989-960), A- (959-930), B+ (929-900), B (899-870), B- (869-840), C+ (839-810), C (809-780), C- (779-750), D+ (749-720), D (719-690), D- (689-660), F (Below 659)

### **Course Information and Policies**

Expectations: The breath of human physiology is immense. Once behind, even in an overview course, catching up is virtually impossible. Quizzes are posted with due dates throughout the semester to encourage students to keep current in their studies. As a graduate course, it is anticipated that students will have a reasonable understanding of basic biological and chemical principles. While the textbook has remedial chapters, under-prepared students should plan on spending extra time and effort in these areas.

Due Dates: ***Due dates will be clearly identified on Canvas and strictly enforced.*** There will be no opportunity to make up missed quizzes or online exams, and a score of zero will be assessed. Late assignments will result in a loss of 10% of the maximum points per day. The final exam must be returned by the due date or a grade of zero will be given.

Note on Technology: While not common, problems with technology do happen. This can be caused by instructor error, server crashes, weather-related power outages or problems with Internet connections. Verified problems with course technology will be dealt with fairly. If you find that the Canvas or web service is not responding or behaving improperly, notify the instructor immediately. If the problem is reasonably beyond the student's control, an opportunity to reclaim missed points *may* be provided. *Normally, assessments will only be reset once per student per semester.*

### **Other Policies of Interest**

Exams and Quizzes: All online evaluations are ***closed book***. It is expected that students will not utilize notes, textbooks, the Internet, or any other source of information during an assessment. Note that use of the Internet during a quiz or exam has been the most commonly detected source of academic dishonesty. Point challenges will only be considered for 3 days after the due date and must be well supported by citing sources (short paragraph indicating why the question is mismarked). Fishing for points at the end of the semester will not be tolerated or considered for altering the letter grade to points

earned mapping.

Plagiarism and Academic Dishonesty: Presenting someone else's work as your own is a serious academic offense. Any material containing plagiarism or reflecting academic dishonesty will receive a grade of zero and result in placing a record of the offense in the department's file. A second offense will result in assignment of an "F" for the course. All instances of plagiarism or academic dishonesty carry the risk of referral to the graduate committee, review of the student's file, and potentially expulsion from the university.

Withdraw and Incomplete Grades: Students should consult the academic calendar for the last day to withdraw from a course which will result in a grade of "W". Instructors are not permitted to withdraw a student; therefore, any student not continuing the class that fails to withdraw will receive a grade of "F". If unusual circumstances prevent completion of a course (such as major hospitalization, overseas deployment, etc.), students may request a grade of incomplete. *At the sole discretion of the instructor*, an "I" may be assigned for the course, and the the instructor will provide the student with an enumeration of requirements with a deadline for completing the course. Grades of incomplete are not for improving course performance and normally will not be considered for students with failing grades at the time of the request.

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### **Students with Disabilities**

It is the policy of the University of Nebraska at Kearney to provide flexible and individualized reasonable accommodation to students with documented disabilities. To receive accommodation services for a disability, students must be registered with the UNK Disabilities Services for Students (DSS) office, 175 Memorial Student Affairs Building, 308-865-8214 or by email [unkdso@unk.edu](mailto:unkdso@unk.edu)

### **UNK Statement of Diversity & Inclusion:**

UNK stands in solidarity and unity with our students of color, our Latinx and international students, our LGBTQIA+ students and students from other marginalized groups in opposition to racism and prejudice in any form, wherever it may exist. It is the job of institutions of higher education, indeed their duty, to provide a haven for the safe and meaningful exchange of ideas and to support peaceful disagreement and discussion. In our classes, we strive to maintain a positive learning environment based upon open communication and mutual respect. UNK does not discriminate on the basis of race, color, national origin, age, religion, sex, gender, sexual orientation, disability or political affiliation. Respect for the diversity of our backgrounds and varied life experiences is essential to learning from our similarities as well as our differences. The following link provides resources and other information regarding D&I: <https://www.unk.edu/about/equity-access-diversity.php>

### **Students Who are Pregnant**

It is the policy of the University of Nebraska at Kearney to provide flexible and individualized reasonable accommodation to students who are pregnant. To receive accommodation services due to pregnancy, students must contact Cindy Ference in Student Health, 308-865-8219. The following link provides information for students and faculty regarding pregnancy rights. <http://www.nwlc.org/resource/pregnant-and-parenting-students-rights-faqs-college-and-graduate-students>

### **Reporting Student Sexual Harassment, Sexual Violence or Sexual Assault**

Reporting allegations of rape, domestic violence, dating violence, sexual assault, sexual harassment, and stalking enables the University to promptly provide support to the impacted student(s), and to take appropriate action to prevent a recurrence of such sexual misconduct and protect the campus community. Confidentiality will be respected to the greatest degree possible. Any student who believes she or he may be the victim of sexual misconduct is encouraged to report to one or more of the following resources:

Local Domestic Violence, Sexual Assault Advocacy Agency 308-237-2599

Campus Police (or Security) 308-865-8911

Title IX Coordinator 308-865-8655

Retaliation against the student making the report, whether by students or University employees, will not be tolerated.

If you have questions regarding the information in this email please contact Mary Chinnock Petroski, Chief Compliance Officer ([petroskimj@unk.edu](mailto:petroskimj@unk.edu) or phone 8400).

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### Tentative Schedule

Date, assignment, sequence and topic are tentative and subject to change by the instructor. **Details for each assignment will be posted on the LMS (Canvas) including due dates.**

Week/Date	Topic/Activities	Assignments
<b>1</b> August 23	Introduction to Course Chemistry of Life Cells and Cell Functions	Worksheet 01 mLab 01 Cells (osmosis) Quiz 01
<b>2</b> August 30	Tissues and Introduction to Histology Histology Slides A Physiology of the Integumentary System	Worksheet 02 Histology Assignment A mLab 02 (skin, sensory fields) Quiz 02
<b>3</b> September 6	Physiology of Bone Physiology of Joints Histology Slides B	Worksheet 03 Histology Assignment B mLab 03 Joints (levers) Quiz 03
<b>4</b> September 13	Physiology of Muscle 1 (skeletal) Histology Slides C	Worksheet 04 mLab 04 Muscle (length strength) Histology Assignment C Quiz 04
<b>5</b> September 20	Physiology of Muscle 2 (cardiac and smooth)	Worksheet 05 Quiz 05 <b>Exam I</b>
<b>6</b> September 27	Mini-Paper	MiniPaper 01 Quiz 06
<b>7</b> October 4	Physiology of Nerves and Sense Organs	Worksheet 06 mLab 05 Nerves (sense organ / eye) Quiz 07
<b>8</b> October 11	Endocrine Physiology	Worksheet 07 mLab 06 Endocrine (function summaries) Quiz 08
<b>9</b> October 18	Cardiovascular Physiology	Worksheet 08 mLab 07 Cardiac (STEMIs) Quiz 09

<b>Week/Date</b>	<b>Topic/Activities</b>	<b>Assignments</b>
<b>10</b> October 25	Physiology of the Lymphatic and Immune Systems	Worksheet 09 mLab 08 (immune response and ELISAs) Quiz 10 <b>Exam II</b>
<b>11</b> November 1	Mini-Paper	MiniPaper 02 Quiz 11
<b>12</b> November 8	Respiratory Physiology	Worksheet 10 mLab 09 Respiratory (tidal volumes, etc.) Quiz 12
<b>13</b> November 15	Digestive Physiology and Nutrition	Worksheet 11 mLab 10 Digestion (nutrition or enzymes) Quiz 13
<b>14</b> November 22	<b>Thanksgiving Break</b> , no new material	
<b>15</b> November 29	Renal Physiology Fluids, Electrolyte and Acid-Base Regulation	Worksheet 12 mLab 11 Renal (transport and Vmax and Km) Quiz 14 <b>Exam III</b>
<b>16</b> December 6	Reproductive Physiology Genetics and Inheritance	Worksheet 13 Quiz 15
<b>17</b> December 13	<b>Finals Week</b> (12/13 - 12/16)	<b>Final Exam</b>
<b>Last Day of Course</b> December 16th	Note this is on <b>Thursday</b> afternoon. Course closes and becomes unavailable a few days later.	