

BMS 300 - Principles of Human Physiology Online 801 Section
Summer 2020
4 credits, traditional grading

Coordinator and Lecturer:
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Additional Lecturer:
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Course Objectives: This course is designed to provide a general introduction to human physiology.

Prerequisites: A college level course in both chemistry and biology. The lectures are prepared with the assumption that students have these prerequisites and individuals without them will likely experience difficulties in this class.

Optional Textbook: *Vander's Human Physiology: The Mechanisms of Body Function*, 13th edition by Eric P. Widmaier, Hershel Raff, and Kevin T. Strang. Out of print editions may also be used.

E-book Required Access Card: An access card must be purchased for the required electronic textbook from Webcom. The book contains the course objectives, notes, and links from the objectives to figures and accompanying narratives designed to accompany, explain, and extend material presented in lecture. The access card can be purchased with a credit or debit card from <http://www.grtep.com> by clicking on the icon that reads "Purchase an access card now". The access card can also be purchased from the CSU bookstore, but it may be more expensive. The electronic book will also be required for access to weekly quizzes (see Homework, below). If you are retaking the course, please contact the course coordinator for instructions on how to renew your access code free of charge. Once purchased, the e-book can be accessed through the "E-book" link on the Canvas homepage.

Expectations: Students are encouraged to use their class notes in conjunction with material provided in Canvas, the textbook, and the e-book. Becoming fluent with the objectives provides the key to success in BMS 300. Students who can discuss each of the objectives without reference to the class notes or the e-book are generally well prepared for the exam. Mastery of the concepts requires mastery of the objectives, which means an ability to verbalize or write the answers to the objectives without reference to the notes or to the textbook. Many students find it advantageous to rewrite their class notes using the streaming videos posted online. Practice is an important part of learning the concepts presented in this course and writing complete and carefully prepared responses has proven invaluable to many students. The learning objectives are intended to guide students through concepts essential for the course, and can be found in the e-book and in the introductions to each day's lecture. Typically, students should spend at least two hours studying for each hour in lecture.

Lecture Videos: Each on-campus lecture will be video recorded and posted as a YouTube link on Canvas in the afternoon. Click on the "Lecture Videos" link on Canvas to access them. Lectures may be viewed on desktop or laptop computers, or on mobile devices such as tablets or smart phones. The streaming rate will automatically match the capacity of your device and bandwidth availability. Alternatively, you click on the gear in the bottom right, and manually choose low (360), medium (720) and high resolution (1080). Generally, lectures are available in the afternoon of the day they were given but may take up to 24 hours to post.

Live Streaming: As a courtesy, the lectures will also be streamed live on our YouTube channel, Colorado State BMS300. You may access the live stream directly through YouTube or via the Canvas link for Live Streaming.

Additional Learning and Extra Credit Opportunities:

- **Homework:** Prior to each section's lectures, an online multiple-choice quiz will be posted in the e-book on Webcom and may be accessed via the Canvas page. The quiz questions are intended to acquaint students with upcoming lecture material and are designed to familiarize students with information in the notes and objectives before lecture. Each five-question quiz is worth a maximum of 1.0 point with each question worth 0.2 points. A maximum of 12 participation points will be added to the total number of points scored on the unit exams and final. Points earned will be added AT THE END of the semester.

Schedule of e-book Quizzes

Quiz:	Topics:	Date open 8:00 am MDT	Date Close 8:00 am MDT
Quiz 1	Cells and Tissue	Jun 15	Jun 18
Quiz 2	Skin and Bone	Jun 18	Jun 22
Quiz 3	Endocrine	Jun 22	Jun 25
Quiz 4	Nervous I	Jun 25	Jun 29
Quiz 5	Nervous II	Jun 29	Jul 2
Quiz 6	Muscle	Jul 6	Jul 9
Quiz 7	Cardiovascular I	Jul 9	Jul 13
Quiz 8	Cardiovascular II	Jul 13	Jul 16
Quiz 9	Blood and Immune	Jul 16	Jul 20
Quiz 10	Respiration	Jul 20	Jul 23
Quiz 11	Renal to Stomach	Jul 23	Jul 27
Quiz 12	Intestine and Liver	Jul 27	Jul 30
Quiz 13	Reproduction	Jul 30	Aug 5

- **Lecture Quizzes:** Brief multiple-choice quizzes will be posted on Canvas daily. These quizzes are designed to give you a place to start your studying by helping you identify the most important concepts of each lecture. **Each quiz opens at 11 am MDT the day of the corresponding lecture and closes at 11:59pm MDT the following day.** You can earn up to a total of 8 points extra credit through the completion of these quizzes based on the percentage correct. Points earned will be added AT THE END of the semester.
- **Tutorials:** Online tutorials will be held several times each week and will be hosted on Zoom by undergraduate student volunteers who have excelled in BMS 300 in previous semesters. We have found student discussion is extremely helpful in guiding students in techniques for mastering the material in BMS 300. Verbalizing the material presented in class has proved to be one of the best ways to absorb and retain physiological concepts key to BMS 300. The Tutorials link on Canvas contains a calendar of all tutorials and instructions on how to access Zoom. **Attendance at these online sessions will be recorded, and students who have attended at least 10 weekly sessions during the semester will have 5 points added to their final score. Only two sessions per week will be counted toward the total.** These 5 points will be added AT THE END of the semester and there will be NO partial credit given for less than 10 tutorials. It is important that students joining Zoom use a login name in the form of their **lastname.firstname** every time they attend.

Academic Integrity: BMS 300 adheres to the CSU Academic Integrity Policy and the Student Conduct Code (<https://resolutioncenter.colostate.edu/academic-integrity/>) and (<https://resolutioncenter.colostate.edu/student-conduct/code/>). At a minimum, violations will result in a grading penalty in this course and a report to the Office of Conflict Resolution and Student Conduct Services.

Printing, copying or possessing a copy of an exam without the author's consent will be considered a violation of the University's academic integrity policy. Neither calculators nor phones will be allowed out during examinations and having a phone out during an exam will be considered a violation of the University academic

integrity policy. Students IDs will be checked for each exam so please be prepared to show picture identification at the time of the exam.

Exam Info: There are four (4) Unit Exams and a Final Exam, each worth 100 points. The Exam Info link on Canvas is where you will access your exams, as well as practice exams which we will post one week before each exam date. The examination schedule is listed at the end of the syllabus. **Unit Exams must be taken after the exam opens on Monday at 9:00 am MDT and before it closes at 6:00 pm MDT on Tuesday.** For example, the exam scheduled for Monday, June 29 can be taken between 9:00 am on Monday and 6:00 pm on Tuesday, June 30. All Unit Exams will be 32 multiple choice questions, each worth 2.5 points for a total of 80 points. Three passage questions will be fill in the blank (FIB) questions, with each blank worth one point. Because there will be more than 20 blanks, scores higher than 100 are possible. The exams are computer graded, but **the FIB section will be manually regraded to allow for misspellings and other appropriate answers.** After regrading, Canvas will still show answers as incorrect even if you were given credit for them. Please check the final score at the top right of each question to see how many points you actually received. Unit exam scores will be recorded in Canvas for each exam as points (not percentages). The general topics covered by each unit examination are also noted on the syllabus, and typically there will be 3 or 4 questions per lecture. The Final Exam will be a comprehensive multiple-choice exam of 75 questions, each worth 1.34 points. You must take the final examination to complete the course and the final examination will be used in computing your course grade. **The Final Exam will open at 9:00 am MDT on Friday, August 7, and close at noon MDT on Saturday, August 8.**

Proctoring Exams. The four unit exams and the final will be administered through Canvas. Each student must make arrangements to have each exam proctored by the internet proctoring service, ProctorU. The cost for the proctoring service is included in the course tuition and fees. Go to <http://proctoru.com> to register and generate a username and password. Exams proctored by ProctorU require a webcam and microphone. The service is available seven days a week between 9am and midnight MT.

Each student must schedule an exam with ProctorU at least four days prior to taking the exam to avoid a penalty charge. To schedule your exam, log into ProctorU and choose a date and time. You must receive a confirmation from ProctorU, otherwise the exam is **NOT** scheduled. At your scheduled time, login and follow the instructions to take the exam. **The proctor must observe the students destroy their scratch paper and must watch them close the exam in Canvas. Logging out of ProctorU before closing the exam in Canvas can potentially nullify the exam score and result in an exam score of 0.**

Make-up Examinations: There are no provisions for make-up examinations during the summer. In a case where an examination has been missed or where the final exam score is higher than one of the unit exams, the final exam will substitute for that unit exam and will count twice. Only one such substitution may be made. Any student who misses more than one examination must present evidence in a timely manner to the coordinator and show that all absences were for reasons that meet the University criteria for excused absences. **IN MOST CASES (EXCEPT FOR CLEAR EMERGENCIES), ARRANGEMENTS MUST BE MADE PRIOR TO THE SCHEDULED EXAMINATION.** For such cases, a mutually acceptable arrangement will be sought for make-up examinations. Unexcused absence from a second missed examination will result in a zero score.

Audits: Anyone taking the course for formal audit credit must take the examinations or demonstrate by some other means that he/she is participating in the course in order to obtain a satisfactory audit grade.

Completing an Incomplete Grade. If you are completing an Incomplete grade (I), please contact the course coordinator so that your name can be added to the roster of students in Canvas. If you are completing the course, but are not registered for attending the university, please contact the course coordinator.

Special Needs: If you have special needs which will assist this learning experience and which we may be able to accommodate, please feel free to contact Dr. Walrond.

Total Points: The combined total points for the course will be 500, based on 100 points for each of five exams. You must take the final examination to complete the course and the final examination will be used in computing your course grade. In cases where your final examination score is higher than a unit examination score, the score on the final will substitute for your lowest unit examination score. If your lowest score is on the final, this score will be counted once and added to the scores on the four unit exams.

Examples of grade Calculation	
Example #1	Example #2
T #1 = 82	T #1 = 86 92
T #2 = 88	T #2 = 88
T #3 = 92	T #3 = 92
T #3 = 92	T #4 = 94
Final = 80 (Final is lowest score)	Final = 92 (Final is higher than lowest score)
EC = 5	EC = 5
Total = 439 / 500 Course Total = 87.8 = B	Total = 463 / 500 Course Total = 92.6 = A

Grading: Your course grade will be based on your performance in the unit examinations and on the final examination. Grades will be based on the following percentages:

- A = 90% and higher
- B = 80 to 89%
- C = 70 to 79%
- D = 60 to 69%
- F = 59% and below

If the class mean falls below the C range, the coordinator may shift the break points downward. Under no circumstances will the break points be shifted upward. Extra credit points from the e-book quizzes and tutorial attendance will be added to your point totals after the grade breaks are established at the end of the semester.

BMS 300 Lecture and Exam Schedule, Summer 2019			
Date	Day	Topic	Lecturer
Jun 15	M	Introduction/Cells	Dr. Walrond
16	T	Cells and Membranes	Walrond
17	W	Cells and Proteins	Walrond
18	R	Cells and Transport	Walrond
19	F	DNA and RNA	Walrond
22	M	RNA and Translation	Walrond
23	T	Cells and Tissue	Walrond
24	W	Skin and Bone	Walrond
25	R	Endocrine System	Walrond
26	F	Endocrine System and HPA	Walrond
Jun 29	M	Exam 1: Cells thru Endocrine	
30	T	Nervous System	Walrond
Jul. 1	W	Nervous System	Walrond
2	R	Action Potentials	Walrond
3	F	NO CLASS	Walrond

6	M	Action Potentials	Walrond
7	T	AP and Sensory	Walrond
8	W	Reflexes and Pathways	Walrond
9	R	Nervous System and Muscles	Walrond
10	F	Skeletal and Smooth Muscle	Walrond
13	M	Exam 2: Nervous thru Muscle	
14	T	Heart and Blood	Walrond
15	W	Cardiomyocytes	Walrond
16	R	Autonomics	Walrond
17	F	Systemic Vasculature	Walrond
20	M	Blood	Walrond
21	T	Immune	Walrond
22	W	Immune	Walrond
23	R	Respiratory Anatomy	Walrond
24	F	Gas Exchange	Walrond
27	M	Exam 3: Cardiovascular thru Immune	
28	T	Renal	Walrond
29	W	Renal	Walrond
30	R	Mouth to Stomach	Walrond
31	F	Small Intestine to Liver	Walrond
3	M	Exam 4: Renal thru Digestion	
4	T	Sex Determination	Dr. Bouma
5	W	Male and Female Reproduction	Bouma
6	R	Fertilization and Pregnancy	Bouma
7	F	Final Exam - Comprehensive	

NOTE IMPORTANT: "W" drop period ends Monday, July 13.

The Distribution of Questions on the Final	
TOPIC	# OF QUESTIONS
Cells	6
Tissues/Skin	5
Skeletal	4
Muscular	5
Nervous System	10
Endocrine	5
Cardiovascular	7
Blood, Immune & Lymphatic	5
Respiration	4
Urinary	5
Digestion	5
Reproduction	14
TOTAL	75 QUESTIONS

As part of the Learning Objectives for BMS 300 you will be expected to be able to:

1. Recognize the role of water as a solvent in cell biology and its relationship to hydrophilicity and hydrophobicity and biological membranes.
2. Describe the structure and function of organelles in eukaryotic organisms, and compare and contrast cytoplasmic and membrane protein synthesis.
3. Describe the role of nucleic acids in protein synthesis and relate them to the Central Dogma of molecular biology.
4. Describe the cellular organization of tissues, and relate the function of each to how they are organized into organs including skin and bone.
5. Explain the role of the endocrine system in the homeostatic control of body function, and describe the importance of receptor-ligand binding and negative feedback in this system.
6. Describe the structural organization of the central and peripheral nervous systems and distinguish among sensory input, analysis and motor output and explain its relationship to sensory neurons, interneurons, and motor neurons.
7. Describe the structure of neurons and interrelate the roles of membrane potential, synaptic potential and action potential in intercellular communication in the nervous system.
8. Sketch the cellular organization of skeletal muscle and relate the drawing to excitation contraction coupling and the Sliding Filament Theory of muscle contraction.
9. Describe the structure of the heart and the pattern of blood flow through it including systemic, pulmonary, and coronary flow.
10. Interrelate the cellular organization of the heart with the differential ion channel distribution and describe the conductile and contractile systems as they relate to heart rate, rhythm, contraction, and the cardiac cycle.
11. Describe the components of blood and relate their functions and roles to carrying oxygen and to innate and adaptive immunity.
12. Describe lung structure including the conducting and respiratory zones relate the structure to the role of the diaphragm in inspiration and the role of compliance and elastic recoil in expiration.
13. Relate Dalton's Law of Partial pressures to gas exchange in the alveolus and describe the structural and functional relationships between the alveolar epithelium and the endothelium of lung capillaries.
14. Describe the gross and cellular organization of the kidney and interrelate the structural and functional aspects of the blood vascular and renal compartments to kidney function. Differentiate ion and water movement in each of the regions of the nephron as it relates to paracellular and transcellular transport.
15. Describe the structure of the gastrointestinal tract and relate its cellular organization to motility, secretion, absorption and hormonal control in this system
16. Understand the role of genetics and hormones in sexual differentiation and describe the organization of the male and female reproductive systems.

17. Describe the events of fertilization, implantation and fetal development.