

Course Name: Medical Physiology 2022-2023

Course Number: Physio 611/701

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Course Description

The two main goals of this course are (1) to help you learn the fundamental mechanisms of human physiology needed for the effective practice of modern medicine, and (2) to stimulate your lifelong interest in learning physiology and pathophysiology. The main reading for the course will be taken from the *Textbook of Medical Physiology*, Guyton & Hall, 14th edition.

The classes are intended to emphasize the most important physiological concepts and to assess your understanding of the assigned reading. Because the textbook provides extensive coverage of most areas of physiology, some of the textbook material cannot be discussed in the classes. Nevertheless, it is advantageous to be familiar with all aspects of the textbook, except for those sections specifically excluded by the various instructors. In addition to the textbook material, there may be discussion of pathophysiology and clinical medicine, especially in problem-based learning exercises and clinical correlation classes, in order to illustrate physiological principles and the importance of physiology to clinical practice.

Course Schedule

The course schedule posted in Canvas gives the times and dates for the various classes; the instructors may provide additional information or slightly modify the schedule but any modifications of reading assignments will be provided to you in advance of the classes. It is, of course, advantageous for you to arrive on time for the quizzes and exams. We will **not** be able to administer any quizzes or exams to students who arrive after other students have completed the quiz or exam.

Overall Course Objectives

1. Students will describe the normal structure and function of the human body and each of its major organ systems across the life span. This includes (1) describing the normal structure and

function of the human body at the sub-cellular, cellular, tissue, organ and whole body level; (2) discussing the normal process of pregnancy; and (3) describing the effects of extreme environments on the physiological functions of the human body.

2. Students will describe how the major organ systems interact to maintain homeostasis and the major feedback control systems that coordinate and integrate their functions, including cellular and sub-cellular control systems as well as hormonal and neural control systems.

3. Students will describe sex- and age-related differences in structure and function of the human body in health and disease.

4. Given appropriate laboratory data and patient histories, students will assess patient health and disease using physiological principles.

(Detailed specific objectives are provided for each of the 8 sections of the course.)

Core Competencies

Patient Care

Students must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Corresponding Course Objective(s): N/A

Medical Knowledge

Students must be able to demonstrate knowledge about established and evolving biomedical, clinical, and cognate (e.g. epidemiological and social-behavioral) sciences and the application of this knowledge to patient care. Corresponding Course Objective(s): 1,2,3, and 4

Practice-Based Learning and Improvement

Students must be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices. Corresponding Course Objective(s): 1,2,3, and 4

Systems Based Practice

Students must be able to demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value. Corresponding Course Objective(s): N/A

Professionalism

Students must be able to demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population. Corresponding Course Objective(s): 4

Interpersonal and Communication Skills

Students must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, patients' families, and professional associates. Corresponding Course Objective(s): 4

Teaching Methods

The course will consist of individual study of reading assignments, class discussions, clinical correlations, problem based learning (PBL) sessions and laboratory simulation exercises. Each instructor will provide a list of knowledge objectives and self-assessment questions. The instructors may also provide handouts that contain copies of complex slides to assist you with note taking if the material is not covered in the textbook. Much of this material is copyrighted and is made available only for your use in this course.

Your individual study of the assigned reading of the textbook prior to class will be emphasized in this course. An important objective of the classes is to assess your level of understanding and to help you with those areas in which you are having difficulty. When classes are in-person, instructors may use a series of questions to help guide class discussions and to assess your knowledge of the assigned reading. You will utilize electronic devices in some cases to register your response to questions and to obtain immediate feedback about your comprehension of the material. The instructors will explain physiological principles underlying the questions, especially in instances where students are unable to answer the question correctly. This approach will also help focus discussion on areas that are more challenging to you and will promote "active" learning, as opposed to the "passive" learning that takes place with most formal lectures. The knowledge gained through active learning is much deeper and will stick with you longer than information gained by passive processes. One of our major goals in this course is to help you develop lifelong learning habits that will be necessary to sustain you throughout your medical careers.

Assessment Methods

The grades for the course will be derived from several sources:

1. The 7 section quizzes for the various sections (approximately 4 questions/chapter). The quizzes may also include questions derived from the clinical correlations, PBL exercises, and previously tested sections. The number of questions from previous sections (generally the previous one or two sections) will be approximately 20% of each section quiz.
2. The Final Exam will be cumulative and will be administered on Friday, April 28, 2023. This test will include an average of 2.5 questions per chapter from the entire course.
3. The National Board Exam for Physiology, which will be administered on Monday, May 1, 2023.

4. Bonus points are from correctly answered Nearpod Quiz questions (a total of approximately 3% could be added to the final grade for the entire course) that will be given during the course.
5. The laboratory exercises will be evaluated as “satisfactory” or “unsatisfactory”. Satisfactory completion of all laboratory exercises is required for successful completion of the Medical Physiology course. Dr. Hester will review the objectives and procedures for the labs.

The format of most questions on the tests will be similar to those used for the United States Medical Licensure Exam (USMLE). Each question for the section tests will count the same as other questions, although certain material may be given greater emphasis. The scores from the National Board Exam will be scaled so that the Board Subject Test mean will be equivalent to a local score of approximately 83%. Final grades will be rounded to the nearest hundredth at the end of the year.

Mechanical or electronic devices capable of receiving, storing or transmitting information, such as smartwatches, smartphones, calculators etc. are not permitted in School of Medicine classrooms during tests. The only exception is the laptop used to take the quiz or exam. The calculator tab in ExamSoft will be enabled for quizzes or exams that require a calculator. If it is necessary for tests to be given remotely, we will provide additional information.

Listed below are the approximate percentage contribution of the various tests to the overall course grade:

Tests:	Percentage of Total Grade (approximate):
7 Section Quizzes	60%
Cumulative Exam	25%
National Board Exam	15%
Total	100%
Bonus Points	Maximum of ~3% added to final grade

The tests will be graded by ExamSoft, if the test is given in person. If it is necessary for the tests to be given virtually, the test will be graded by Canvas. We will post in Canvas the class distribution and average, as well as the total of bonus points earned during that section as soon as possible, normally within 48 hours after the test. If you have questions about the individual tests, please contact the instructor after the test has been completed. Instructors will not be able to answer questions during the quizzes/exams. If students have challenges to questions on a test, these should be presented to the M1 liaison committee. All question challenges must be received by the course coordinator within one week after the test; no challenges will be

accepted after this time. Additionally, students may make appointments (via WebEx or another tool for virtual meetings) with the course coordinator to review a test within the designated time frame.

Educational Resources

Hall JE and Hall ME. *Guyton and Hall Textbook of Medical Physiology*. 14th ed. Philadelphia, PA: Elsevier.

Hall JE and Hall ME. *Pocket Companion to Guyton and Hall Textbook of Medical Physiology 14th Edition*. Philadelphia, PA: Elsevier.

Course Policies

Nearpod/Canvas Bonus Questions: The instructors will assess your knowledge of the assigned reading with questions at the beginning of the classes using Nearpod, if lecturing in person. If lectures are presented virtually, Canvas quizzes will be utilized. Correct responses to these selected questions will count as “bonus” points (a total of about 18 points for the entire course, or about 0.3 points per chapter). Typically, 3 questions might be given as “bonus” questions for a chapter at the beginning of class. In this case, each question would count as approximately 0.1 point. If 4 questions are given, each question would count approximately 0.075 point. The instructors will indicate which questions count for the bonus points. The questions will be based on the reading assignment for the day. Students who miss the questions will not be penalized (the missed question will not be computed as part of the overall grade), but students who answer questions correctly will receive bonus points. Please note that for Nearpod/Canvas bonus questions students should follow the same rules as for regular quiz questions – books, computers, smartphones, smartwatches, etc. should not be used to assist in finding answers for the questions, and students should not consult with each other on the answers for the questions that count as bonus points. Students should follow the School of Medicine Policies on Professional Behavior and Academic Integrity for the questions as well as for all other aspects of the course.

What should you do if you experience technical difficulties (e.g. internet connection is lost, battery dies): You may request a paper copy of the questions if lectures are in person. Please return your answers written on the paper copy to the instructor immediately after the allotted time for the questions has expired on Nearpod.

What should you do if you miss a section quiz: We will not be able to administer make up quizzes.

If you are a medical student and are unable to attend one of the section quizzes because of personal health related issues related directly to the student or a primary degree relative (illness, hospitalization, parent/spouse/child illness, death, etc), please:

1. Complete the absence request in MedHub for each day that you will be out EXCEPT for COVID-related issues, which are reported through the UMMC student/employee

hotline at empcovidhotline.umc.edu. Student Affairs/Office of Medical Education (OME) will review absence requests from MedHub as well as the COVID testing list.

2. Contact the Student Affairs/OME to find out if your absence has been approved. If the absence has been approved, they will notify us.

For any non-medical absences, contact the Course Coordinator who will consult with the Course Director and determine whether your absence request is approved.

If you are a graduate student and miss the test for medical or non-medical reasons, please contact the Graduate Office and they will determine if the excuse is acceptable, EXCEPT for COVID-related issues, which are reported through the UMMC student/employee hotline at empcovidhotline.umc.edu.

For those who miss the quizzes without an acceptable excuse, the grade for the quiz will be registered as zero. If too many quizzes have been missed, as determined by the Course Director in consultation with the OME or Graduate Office, the grade for the course will be registered as incomplete. Any student who misses a section quiz will not be eligible for the Medical Physiology Award. The cumulative exam and National Board exam must be completed to successfully complete the Medical Physiology course.

Laboratory Exercises: Attendance and a satisfactory laboratory grade for all laboratories are necessary for successful completion of the medical physiology course. Questions from the laboratory exercises may also be included in the section tests. For those who miss the laboratory without an acceptable excuse or even with an excuse, or if too much laboratory time has been missed, special exercises will be required such as writing library reports.

Attendance: We hope that you will find the classes to be interesting and believe that they will be highly beneficial to your education. Attendance is expected at all classes but will be required and monitored only at all laboratory exercises, problem based learning sessions (PBLs), and Clinical Correlations given by speakers from outside the Physiology department. Participation in these sessions will be graded as Satisfactory or Unsatisfactory, and all of these special sessions must be completed in a satisfactory manner to receive a passing grade in the course. For those who miss these special sessions without an acceptable excuse, or even with an excuse if too many sessions have been missed, special exercises will be required such as writing library reports. Attendance at the designated special sessions will be taken by the course coordinator. If special sessions are presented virtually, attendance will still be taken.

Evaluations: You will have the opportunity to evaluate each of the instructors as well as the entire course. These evaluations are important in helping us improve the course and in letting us know how we are doing in each area of physiology. If you have suggestions that you think would help us improve the course, please let us know.