

Course Name: Medical Physiology

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 material for the course will be taken from the *Textbook of Medical Physiology*, Guyton & Hall, 13th 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.

Course Objectives

1. The student 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 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. The student 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.
3. The student will describe sex/gender differences in structure and function of the human body in health and disease.
4. Given appropriate laboratory data and patient histories, the student 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 lectures, clinical correlations, problem based learning 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. Instructors will use a series of questions to help guide class discussions and to assess 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. We believe that 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 Method

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, May 1st. 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 4th.
4. Bonus points from correctly answered clicker questions (a total of about 18 bonus points for the entire course) that will be given during the course.
5. The laboratory (Dr. Hester will review the objectives and procedures for the labs). 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.

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 82%. Final grades will be rounded to the nearest ten thousandth 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.

Listed below are the approximate number of questions on the various tests and the approximate percentage contribution of these tests to the overall course grade:

Tests:	Approximate Number of Points:	Percentage of Total Grade (approximate):
7 Section Quizzes	295	58%
Cumulative Exam	140	27%
National Board Exam	75	15%
Bonus Points	~18	-
		100%

The tests will be graded by ExamSoft. We will post in Canvas the class distribution and average, as well as the total of clicker 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 after the quizzes/exams have started. If a student has a challenge to a question on a test, this should be presented to the M1 liaison committee immediately after the post-test review. All question challenges must be received by the instructors within one week of the post-test review; no challenges will be accepted after this time. Additionally, students may review a test with the course coordinator within the designated time frame.

Educational Resources

Required Text:

Hall JE. *Guyton and Hall Textbook of Medical Physiology*. 13th ed. Philadelphia, PA: Elsevier. ISBN: 9781455770052.

Recommended Text:

Hall JE. *Pocket Companion to Guyton and Hall Textbook of Medical Physiology 13th Edition*. Philadelphia, PA: Elsevier. ISBN: 9781455770069.

Course Policies

Turning Point Quizzes: The instructors will assess your knowledge of the assigned reading with clicker questions at the beginning of the classes. Correct responses to these selected clicker 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 0.1 point. If 4 questions are given, each question would count as 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 be rewarded with bonus points. Please note that 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 must be in the classroom to answer the questions and should follow the School of Medicine Policy on Professional Behavior for the clicker questions as well as for all other aspects of the course.

Please purchase your clicker or register your smart device with Turning Point before the Medical Physiology course begins and be certain that it is functioning properly before class begins. Also, please be sure that your clicker or smart device is properly registered (the clicker registration number is *not* your student ID or social security number).

What should you do if your device malfunctions (e.g. battery dies): You may use a 3” x 5” note card to provide your answers, but generally not more than 5 times. Please write your name and answers (e.g., a, b, c, d,...etc.) to questions (i.e. 1, 2,...etc.) on the card and return your answers to the instructor.

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 sickness or another acceptable excuse, please contact The Office of Student Affairs (Dr. Clark) who will determine if the excuse is acceptable. If you are a graduate student, please contact the Graduate Office. 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 Office of Academic Affairs or Graduate Office, the grade for the course will be registered as incomplete. Any student who misses a section quiz will no longer 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, if too much laboratory time has been missed, special exercises will be required such as writing library reports.

Attendance: We anticipate that you will find the classes to be interesting and highly beneficial to your education. We also believe that the spirit of the class is greatly enhanced by your presence at the teaching exercises. 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.

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 if we are doing a good job in each area of physiology. If you have suggestions that you think would help us improve the course, please let me know.
