

HUMAN ANATOMY & PHYSIOLOGY I SYLLABUS - **BIOLOGY 253** – lecture/lab

Course Description: This is the first course of a 2-semester course sequence in which students study the anatomy and physiology of the human body. The course includes introductions to basic chemistry, biology, and histology, and extends to the survey of the integumentary, skeletal, muscular and nervous systems. This course includes a laboratory component in which students are responsible for performing dissections and making original observations on dissected material. The laboratory experience culminates with the use of a plastinated human specimen for observation. It is a difficult course requiring hard work and discipline to be successful. A strong background in biology and/or chemistry is highly recommended. Prerequisites: ENG 085* and MAT 020 or higher*.

A caution from your instructor: Remember that this is a lab science course so should be thought of as two courses. **It is not recommended for students who have not had prior college level science. Chemistry and some biology is strongly suggested prior to this course.** Students earning a final grade of 3.0 or higher report studying **at least 20 hours per week for this one course.** Please plan accordingly when considering this course.

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| Instructor: Jan Bradford Phone (517) 796-8648 Email: jbradford@jccmi.edu (*best to reach me) | Office: JM 110 Hours: M.8:30-9am, 11am-noon; T.8:30-9am, 12:00-12:30pm; W.11am-noon; Th/F. Online office hours. Others by appointment. |
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Feedback Timeframes: To the best of my ability, email replies to coursework questions will be sent between 8AM on Mondays and noon on Thursdays, within 24 hours of message receipt from a student.

Technical Support: For technical difficulties, try using the Help Forum to get help from classmates. Or you can contact the distance learning / information technology office.

Texts and Materials:

Required:

[Text available in digital format.]

PRINCIPLES OF ANATOMY AND PHYSIOLOGY, Tortora & Derrickson; 14th edition [ISBN: 9781118866306]

– Other A&P textbooks for a full-year class (25-29 chapters) are acceptable (e.g. Martini, Marieb, Patton, Saladin or Seeley). (There is an online A&P text available at www.openstax.com; it is missing some information for the end of this course and the beginning of BIO 254.)

Lab Manual for Anatomy & Physiology I, Bradford & Visser; 1st edition [ISBN: 9781465274823]

Anatomy and Physiology I Coursepack - Bradford sections; from the JC Bookstore



Grade: The grade you earn in this course will be based upon total points accumulated on:

- 1) In Class/Lab Participation/Quizzing (60 pts. total)
- 2) Homework Assignments and/or Pop Quizzes (minimal pts. each)
- 3) Online Chapter Terminology Quizzes (50 pts. total)
- 4) Theory Exams (100 pts. each)
- 5) Lab Practicals (25-100 pts. each)

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| Grading scale: [You will be expected to keep a record of your grades. Grades will be posted on our course-site.] | | | |
| 4.0 (A) 95-100% | 3.5 (A-/B+) 90-94% | 3.0 (B) 85-89% | 2.5 (B-/C+) 80-84% |
| 2.0 (C) 75-79% | 1.5 (C-/D+) 70-74% | 1.0 (D) 65-69% | 0.5 (D-) 60-64% |

Absence Policy: You are responsible for all assignments, handouts and materials covered in both lecture and lab. Make-up opportunities for the exams and/or practicals are extended only in the case of emergencies / hospitalization / funerals and require written documentation verifying the cause of the absence. It is your responsibility to contact your instructor for arrangements. **Second and subsequent make-up exams will be awarded only 80% of the achieved score. Practicals may not be made up unless you can take the practical with another lab section. In the event of a**

missed practical, you may either take a zero for the score, or take an incomplete for the course, and make up the practical the next semester that BIO 253 is offered.

General Philosophy: You are an adult and a college student. As such you are expected to be able to work and learn independently, and to be responsible for all assignments and materials. This is a difficult course, and will cover a tremendous amount of material; that will require hard work and discipline. You will need to keep up, as the pace of the class is fast, and it will pick-up as we cover the last few chapters and get into consolidation and review. **There are no quick, easy ways;** what you learn here will be directly proportional to the amount of effort you have expended. You're also expected to be considerate of the rights of others and not to interfere with those who are trying to study, work and learn.

Miscellaneous:

- * **No phone nor camera usage during any class times; no exceptions unless instructor directs use.**
- * No materials will be used during examinations of any kind, except those provided by your instructor. No electronic devices are allowed during examinations. You will need a #2 pencil for examinations.
- * An exam score curve (or linear addition) MAY be used for each exam. The curve is a privilege.
- * It is expected that problems that occur because you feel an error has been made, or disagree with what has been done, or feel that you have been treated unfairly, will be brought to my immediate attention so that they can be resolved.
- * There will be no extra credit projects for this course, since it is felt that your time will be better allocated in studying the assigned materials.
- * An iClicker **may** be loaned to you during class visits for the semester. **At no time will this iClicker leave the lab room!** You will borrow your loaner clicker at the beginning of lab and return it to where it belongs at the end of each lab. Your final grade will not be issued if your clicker is missing. **You are responsible for the replacement cost of your clicker should it become damaged, or is missing.**
- * Supplemental materials may be used at your home or in the JC Computer Labs. **The text's companion website** is available -- see instructions in your text.
- * Tutors and additional free services for academic success are available at the Center for Student Success. CSS will help you with writing, study skills, test anxiety, math and reading.
- * Students with documented disabilities should contact the Center for Student Success as soon as possible to ensure that accommodations are implemented in a timely fashion.
- * A student found cheating or plagiarizing information will either receive a score of zero on that particular exam or assignment, or a grade of 0.0 in the course. In addition, the Academic Deans will be informed of any such incident. The JC Academic Honesty Policy is at: <<http://www.jccmi.edu/administration/deanoffaculty/academicHonestypolicy.htm>>

LABORATORY PROCEDURE: The lab period is a time of active learning involving the study of various materials, interactive projects, and other activities to enhance class success. Interaction with, and learning from, other members of the class and the instructor are critical parts of the lab environment. Cooperation with other students and the instructor in keeping the lab orderly and clean is expected. Please observe the following laboratory guidelines, and encourage your partners to do the same.

1. Specific instructions will be given at the beginning of each lab period. You will be expected to complete all the assignments that require dissection or lab apparatus during this time.
2. You will be expected to return all materials, apparatus, and reference books to their proper place at the end of the lab period. Apparatus that has been used should be washed with tap water and blotted dry with paper towels. Please leave materials neatly arranged; all members of each working group will be held accountable for the condition and return of all lab materials.
3. Consult with other members of the class and the instructor concerning any part of your work. Cooperation and consultation are encouraged: however, make certain that you completely understand everything since you will be held individually accountable for all materials covered.

4. Disruptive behavior and loud conversations will not be permitted. Do not disturb others.
 5. Expect to work the entire allotted class period. Lab and recitation typically require the full amount of time.
 6. 60 points of your final grade will be based on your attitude and effort in lab during the on-site days, as demonstrated by your cooperation and concentration in lab; as well as from in class assignments.
 7. Any information covered in lab is "fair game" for both the lab practical exams and class/chapter exams. Lab practicals, however, are limited to information on the lab practical lists.
 8. **Use of the human materials and cadaver mandates** a requirement to sign the **LEARNING CONTRACT** prior to participation of any kind. This contract will require reading and acceptance of: the Human Specimen Respect Policy and the "Anatomy and Physiology Lab Rules". These can be found on the course JetNet site. [BIO 253 students will not be dissecting nor working extensively with the human specimen. Instructor demonstration of the specimen will be part of the course.]
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General Education Outcomes (GEOs)

The Board of Trustees has determined that all JC graduates should develop or enhance certain essential skills while enrolled in the college. The General Education Outcome for Bio 253 is: GEO 4 (Scientific Reasoning).

Educational Objectives:

Body Structure

1. Define and/or demonstrate anatomic visualization terminology (planes, regions, directional, positional).
2. Differentiate between the various levels of organization, and body systems in humans.

Homeostasis and Imbalance

1. Define, and give examples of, general homeostasis processes.
2. Describe homeostatic control, and effects of imbalance for bone, muscle and nervous tissue.
3. Identify the major steps in injury repair for the integumentary, skeletal, muscular and nervous systems.

Survey of Chemistry

1. Demonstrate knowledge of basic atomic structure & chemical bonding.
2. Identify inorganic vs. organic compounds and the major classes of organic molecules.

Cytology

1. Describe membrane structure, function, and movement of chemicals across cell membranes.
2. Identify the functions of the major organelles.
3. Identify the major processes in gene expression/protein synthesis.
4. Describe the steps of and differentiate between cell cycle, mitosis and meiosis.

Histology

1. Identify, and differentiate between the structure, location, & functional roles of the epithelial, connective, muscular and nervous tissues.
2. Differentiate between mucous, serous, cutaneous & synovial membranes.

Integumentary System

1. Identify the histologic structures and functions of the various components of skin and its accessory structures.

Skeletal System and Articulations

1. Identify the general functions of bone & the skeletal system.
2. Identify the microscopic and gross anatomical structures of bone.
3. Describe the processes for embryonic bone formation; as well as the growth, repair, & remodeling of bone.
4. Identify the bones and major bone surface markings.
5. Describe the major classifications, structures, & functions of articulations.

Muscular System

1. Describe the general functions of muscle tissue.
2. Describe the similar and unique characteristics of skeletal, smooth, & cardiac muscle tissue.
3. Describe the gross & microscopic anatomy of skeletal muscle and how they relate to contraction.
4. Describe the physiology of the neuromuscular junction.
5. Describe the basics of ATP generation.
6. Locate, and identify the function of, each of the major skeletal muscles.

Nervous System

1. Describe the organization & general functions of each division of the nervous system.
 2. Describe the gross & microscopic anatomy of nervous tissue.
 3. Describe the principles of the resting membrane potential, graded potentials, and the generation of action potentials.
 4. Identify major classes of neurotransmitters and their function within the nervous system.
 5. Identify the location and function of the major components of the brain & spinal cord.
 6. Describe the protective structures for the central nervous system.
 7. Describe the structure & function of the spinal and cranial nerves.
 8. Describe the function and major components of reflex arcs.
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"Need to Know" Topics from BIO 253 - [Information that most directly flows into BIO 254]

Of course students are expected to study and learn *everything* from a class, but it is even more important when a class is the first in a two-semester sequence and when some information seems to have no relevance to the "real" subject of the class. And of course, there is always the problem of students cramming for a test and then "dumping" what they've learned to make room for the new material that will be on the next test, since once you've been tested on something, you don't need to worry about it anymore, right? Wrong!!! Therefore this is a list of topics from this class that will be very important for you to work extra hard at learning, understanding and remembering because they will show up in various ways later in this class and/or in Bio 254.

- Ch. 1 Body fluids, Feedback loops, Anatomical terminology
 - Ch. 2 Properties: water, Acid-Base & Buffers; Hydrophilic vs. Hydrophobic; Structural differences between organic molecule
 - Ch. 3 Membrane transport & Gradients, Diffusion & Osmosis, Mitochondria, Lysosomes, Meiosis
 - Ch. 4 All tissue types/structures/locations/uses
 - Ch. 5 Functions of skin, Gland secretions
 - Ch. 6 Calcium homeostasis
 - Ch. 7,8 Bone names, Skull structures (especially foramen)
 - Ch. 10 Muscle metabolism (ATP formation), Cardiac & Smooth muscle structure/function
- All of the Nervous System chapter (12-14) material is important because Bio 254 starts off with **3** Nervous System chapters, and the material is all inter-related. That said, it is especially important to understand the following topics:
- Ch. 12 Neurotransmitters and Neuromuscular junction activity, Agonists vs. Antagonists
 - Ch. 13 Anterior vs. Posterior structure/function of the spinal cord, Reflex arcs
 - Ch. 14 Brain stem & Cerebellum functions, Cranial nerves

Anatomy & Physiology Learning Contract

Your instructor will give you a learning contract to fill out and return.

Due before the end of the semester's second week. Failure to hand in will result in an instructor initiated withdrawal.