ANATOMY AND PHYSIOLOGY II (BIO 2312)
SYLLABUS

NEW YORK CITY COLLEGE OF TECHNOLOGY **The City University Of New York**	School of Arts and Sciences **Department of Biological Sciences**

Course Information

Course title:	Anatomy and Physiology 2 (Lecture and Laboratory)	
Course code:	BIO2312 and BIO2312L	
Credit Hours:	4 credit hours	
	3 hours lecture and 3 hours lab per week for 15 weeks	
Prerequisite:	BIO 2311	
Text and Other Materials:	**Lecture**	Fundamentals of Anatomy & Physiology 11th ed., 2011, by F. Martini; Prentice-Hall Pub. Lab Manual:
	Lab	Lab Manual: Laboratory Manual (Fetal Pig), 12th ed., 2011, by E. Marieb; Benjamin Cummings Pub. **Lab coat and dissecting instruments**.
Course Description	This course is a continuation of Anatomy and Physiology I. It covers the structure and function of the cardiovascular, respiratory, urinary, digestive, reproductive and endocrine system, as well as development, metabolism, electrolytes and acid base balance.	

Grading Procedure (see Grading Policies for details)

Lecture: 60% of the final grade (based on 3-4 one hour exams)	Lab: 40% of the final grade (base on minimum of 4 quizzes).

Course Coordinators

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BIO2312 Course-Based Learning Outcomes

Students will:

1. Understand and describe the basic physiological principles of cardiovascular, respiratory, digestive, urinary, reproductive, and endocrine systems.
2. Understand, identify, and describe the basic anatomical structures associated with each organ listed above.
3. Understand and describe development, metabolism, electrolyte and acid-base balance as they relate to the human body.
4. Develop basic dissection techniques relevant to the field of anatomy.
5. Develop basic laboratory techniques relevant to the field of physiology.

City Tech General Education Common Core Learning Outcomes

Students will:

1. Value knowledge and learning.
2. Use the *sciences* as a forum for the study of values, ethical principles, and the physical world.
3. Engage in an in-depth, focused, and sustained program of study.
4. Employ scientific reasoning and logical thinking.
5. Communicate in diverse settings and groups, using written (both reading and writing), oral (both speaking and listening), and visual means. *(Modified)*
6. Derive meaning from experience, as well as gather information from observation.
7. Understand and employ both quantitative and qualitative analysis to describe and solve problems, both independently and cooperatively.
8. Understand and navigate systems.
9. Demonstrate intellectual honesty and personal responsibility.

CUNY Pathways Common Core Learning Outcomes

Students will:

1. Identify and apply the fundamental concepts and methods of a life or physical science.
2. Apply the scientific method to explore natural phenomena, including hypothesis development, observation, experimentation, measurement, data analysis, and data presentation.
3. Use the tools of a scientific discipline to carry out collaborative laboratory investigations.
4. Gather, analyze, and interpret data and present it in an effective written laboratory or fieldwork report.
5. Identify and apply research ethics and unbiased assessment in gathering and reporting scientific data.

Writing-Intensive Expectations

This course will fulfill one of your writing-intensive requirements. You will be expected to complete several writing assignments, both in lab and lecture. These assignments will vary from a few sentences to long essays and lab reports. For long essays or lab reports you will be expected to hand in a first daft before the final copy is submitted. You will be given feedback on these drafts and it is expected you will incorporate these suggestions on the final copy.

Exams
There will be four (4) written exams for lectures, at least 4 tests for labs, and one practical exam. Exam format will include a combination of multiple choice, short answer, fill-ins, drawings, and or labeling.

Assignments
You are responsible for the assigned review exercises. Each assignment will be due the following lab session. Late submissions will result in points being deducted and your overall grade being affected.

Lab Reports (Follow instructor's guidelines)
You will be expected to submit at least one 5 - 6 page lab report. Lab reports must follow the typical lab report outline; abstract, introduction, materials and methods, results, and discussion and conclusion. Lab reports will be submitted on Blackboard. All reports must be double-spaced with 12 point font. Work cited is a required part of the report; therefore, all citations must be done in an appropriate manner.

Plagiarism and academic dishonesty
Academic integrity is of paramount importance to City Tech. It is a serious offense to utilize someone else's work, creations, ideas and other intellectual property without properly crediting and citing these individuals. Whenever and wherever necessary, work from others should be cited accurately and properly. Please take a look at City Tech's Academic Integrity Policy Manual for more information on academic integrity at City Tech.

Accessibility Statement
City Tech is committed to supporting the educational goals of enrolled students with disabilities in the areas of enrollment, academic advisement, tutoring, assistive technologies and testing accommodations. If you have or think you may have a disability, you may be eligible for reasonable accommodations or academic adjustments as provided under applicable federal, state and city laws. You may also request services for temporary conditions or medical issues under certain circumstances. If you have questions about your eligibility or would like to seek accommodation services or academic adjustments, please contact the Center for Student Accessibility at 300 Jay Street room L-237, 718 260 5143 orhttp://www.citytech.cuny.edu/accessibility/.

Lecture Topics

Week 1	**Blood - *Chapter 19*** • Components and major functions of blood • Physical characteristics of blood • Function and major characteristics of RBC • ABO blood types and Rh systems • Function and major characteristics of WBC • Function and major characteristics of platelets • Hemostasis and coagulation

Week 2	**The Heart - *Chapter 20*** • Overview and structure • Coronary circulation • The conducting system
Week 3	• Electrocardiogram • Cardiac muscle physiology • Cardiac cycle • Cardiodynamics
Week 4	**Blood Vessels and Circulation – *Chapter 21*** • Blood vessels – Types, structure and function • Physiology of blood flow • Pulmonary and systemic circuits • Anatomy of the circulatory system (in lab)

Week 5	**Lymphatic System – *Chapter 22***
	• Lymphatic structures and functions
	• Lymphatic system and body defenses
	• Immunity
	  • Innate
	  • adaptive

Week 6	**Respiratory System – *Chapter 23***
	• Structures and functions of the respiratory system
	  • upper respiratory system
	  • lower respiratory system
	• Physiology of respiration
	  • pulmonary ventilation
	  • gas exchange
	  • oxygen transport and hemoglobin
	• Control of respiration
	  • Medulla oblongata, pons and respiratory reflexes control of respiration

Week 7	**Digestive System – *Chapter 24***
	• Functions of the digestive system
	• Structures of the digestive system
	  • The oral cavity
	  • The pharynx
	  • The esophagus
	  • The stomach
	  • The small intestine and associated glandular organs
	  • The large intestine
	• Digestion and absorption

Week 8	**Metabolism and Energetics – *Chapter 25***
	• Cellular metabolism
	• Carbohydrate metabolism
	• Lipids metabolism
	• Protein metabolism
	• Metabolism interactions
	• Diet and nutrition
	• Bioenergetics
	  • Caloric expenditure
	  • thermoregulation

Week 9	**Urinary System – *Chapter 26*** • Components of the urinary system • Structure and function of the kidneys • Physiology of the urinary system • Ureter, bladder and urethra • Urine
Week 10	**Fluid, Electrolyte and Acid-Base Dynamics – *Chapter 27*** • Overview of fluid, electrolyte and acid-base balance • Fluid compartments • Control of urine volume and osmotic concentrations • Electrolyte balance • Acid-base balance
Week 11	**Reproductive System – *Chapter 28*** • Basic reproductive system structures • Male reproductive system • Female reproductive system

Week 12	**Human Development and Inheritance – *Chapter 29***
	  • Fertilization
	  • Gestation
	  • First trimester
	  • Second trimester and third trimester (overview)
	• Labor and delivery
	• Postnatal stages
	• **Basic** principles of genetics; inheritance of human traits; major patterns of inheritance
	• Aging

Week 13	**Endocrine System – *Chapter 18*** • Hormones and hormone structure • Hormone action • Pituitary • Thyroid • Parathyroid

Week 14	**Endocrine System - *Chapter 18*** • Adrenals • Hormones of the kidney and heart • Pancreas • Reproductive hormones • Pineal • Interactive Hormones and stress
Week 15	**Endocrine System continued** **Final Exam**

Note: Students are advised to do the review questions at the end of each chapter. ***Students should refer to the clinical applications manual, which accompanies the text to enhance their understanding of the clinical conditions associated with the study of each system.***

LABORATORY SCHEDULE

Required Lab Manual: 12th edition lab manual by Marieb and Mitchell.

Topic	Exercise/Page Number
Lab 1. Blood	***Ex,*** *29,* RS 439-443
Composition of Blood,	427
Differential WBC count - use prepared slides	431
Hematocrit, (Discussion)	432
Hemoglobin determination, Tallquist, (Discussion)	433
ABO, Rh Typing, (OMIT cholesterol determination);	436
Discuss: hemocytometer counting and coagulation time.	435
Lab 2. Anatomy of the Heart	***Ex.*** *30,* RS 455-458
Gross Anatomy of the heart,	446-448
Pulmonary, systemic and cardiac circulation	4448-450
Microscopic anatomy of cardiac muscle	451
Dissection of Sheep Heart,	452-454;
Lab 3. Cardiovascular Physiology I	***Ex.*** *31,* **RS 469-470 (25 pts),**
Intrinsic Conduction System/Electrocardiography	460-462
Recording ECGs	463
- Regular ECG	
Lab 4. Test 1	
Anatomy of the Blood Ves. and Lymphatic Ves. ,	***Ex.*** *32,* 35, **RS 489-494 (100pts),** RS 537-538;
Microscopic Structures of Vessels,	472-473
Major Systemic Arteries,	474-480
Major Systemic Veins,	481-484
Pulmonary Circulation,	485-486
Fetal Circulation	486-487
Hepatic Portal Circulation,	488
Anatomy Lymphatic Vessels,	530-534
Fetal Pig Dissection,	729-7380

Lab 5. Cardiovascular Physiology II,	***Ex.** 33A,* RS 509 - 514;
Cardiac cycle/Heart Sounds	496-497
Auscultation of Heart Sounds,	498-499
Pulse determination - palpation,	499-500,502
Blood Pressure determinations	502-506
Special Electrical Properties of the Heart (Discussion) -automaticity, rhythmicity, extrasystole, compensatory pause	516
Microcirculation and Local Blood flow (Discussion)	523
Physical and Chemical Factors modifying Heart Rate,	
Lab 6. Anatomy of the Respiratory System	***Ex. 36,*** RS 549-552
Upper Respiratory Structures,	542
Lower Resp. Structures, **(OMIT** sheep pluck & histology)	542-548
Dissection of Fetal Pig Respiratory System,	739-742
Lab 7. Respiratory Physiology	***Ex, 37A* , RS** 571-575
Mechanics of Respiration	554-555
Respiratory Sounds	555-556
Respiratory Volumes and Capacities	556
Acid-Base Balance,	568-569 *(discussion only).*
PhysioEx Exercise 7	PEx- 105 - PEx-117
Lab 8. Anatomy of the Digestive System	***Ex, 38,*** RS 593-598
The Alimentary Canal	578-588
Accessory Digestive Organs	588-589
Dissection of the Fetal Pig	743-748
Lab 9. Chemical Breakdown of Foodstuffs	***Ex. 39A,*** RS 609-612;
Enzyme Action, Starch Digestion by Salivary Amylase	600-602
Pepsin Digestion of Protein,	603-604
Pancreatic Lipase Digestion of Fats, Bile Action,	604-605
Physical processes (Discussion)	606-607
Lab 10. Anatomy of the Urinary System	***Ex. 40,*** RS 623-626
Gross Anatomy of the Urinary System,	614-617
Microscopic Anatomy	617-621
Dissection of the Fetal Pig Urinary System,	749
Lab 11. Urinalysis	***Ex. 41A,* RS** 633-634
Urinalysis **(OMIT** sediment analysis);	628-631
Test prepared "pathologic" urine specimens.	
Lab 12. Anatomy of the Reproductive System	***Ex. 42,*** RS 645-650
Gross Anatomy of the Male Reproductive System	636-638
Microscopic Anatomy of Male Reproductive organs	638-640
Gross Anatomy of the Female Reproductive System	640-643
Microscopic Anatomy of Female Reproductive organs	643-644
Dissection of Fetal Pig Reproductive System	753
Lab 13. Physiology of Reproduction	***Ex. 43,* RS** 661-664; ***Ex. 44,* RS** 671-674
Meiosis	652-653

Spermatogenesis and Oogenesis - discussion,	653-657
Menstrual Cycle	658-659
Embryonic Development,	666-670
Review Fetal Pig dissection.	

Lab 14. **Endocrine System** ***Ex.*** 27, RS **415-418**

Anatomy and Basic Functions	408-411
Microscopic Anatomy of Endocrine Glands	412-414
PhysioEx – Exercise 4	PEx-59

Finish Fetal Pig Dissections. ***Review for practicum***

Lab 15. FETAL PIG PRACTICUM (CUMMULATIVE)
