

**ANATOMY AND PHYSIOLOGY I (BIO 2311)  
SYLLABUS**



**NEW YORK CITY COLLEGE OF  
TECHNOLOGY**  
The City University Of New York

School of Arts and Sciences  
**Department of Biological Sciences**

**Course Information**

<b>Course title:</b>	Anatomy and Physiology 1 (Lecture and Laboratory)	
<b>Course code:</b>	BIO2311 and BIO2311L	
<b>Credit Hours:</b>	4 credit hours	
	3 hours lecture and 3 hours lab per week for 15 weeks	
<b>Prerequisite:</b>	BIO 1101 or equivalent, and CUNY certification in reading and writing. Coreq: BIO2311 Lab.	
<b>Text and Other Materials:</b>	<b>Lecture</b>	Fundamentals of Anatomy & Physiology 11 <sup>th</sup> ed., 2015, by F. Martini, J.L. Nath and E.F. Bartholomew; Pearson
	<b>Lab</b>	Human Anatomy and Physiology Laboratory Manual (Fetal Pig), 12 <sup>th</sup> ed., 2014, by E. N. Marieb and L.A. Smith; Pearson <b>Lab coat and dissecting instruments.</b>
<b>Course Description:</b>	This is the first part of a two semester course.	

**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 (based on minimum of 4 quizzes and 2 practical exams).
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**Course Coordinators**

**Vasily Kolchenko, Olufemi Sodeinde**

**Lecture Instructor:**

**Phone & Email:**

**Lab Instructor:**

**Phone & Email:**

## **Course Description**

This is the first part of a two semester course. It covers the anatomy and physiology of the cell, tissues, integumentary, skeletal, muscular and nervous systems. Prerequisites: BIO 1101, College-level general biology course with lab or a score of 85 or above on the New York State Regent's exam and CUNY proficiency in reading and writing.

## **Student Learning Outcomes**

Students will:

1. Describe the levels of organization of living organisms.
2. Define and explain basic medical terminology as related to the anatomy and physiology.
3. Understand, identify, and describe the various regions, sections, positions and directions of the body.
4. Identify and describe the major body cavities and their subdivisions.
5. Understand and describe the anatomy and physiology of the cell, tissues, skeletal, muscular, nervous and integumentary system.
6. Define and describe mechanisms involved in homeostatic regulation of the body.
7. Develop basic dissection techniques relevant to the field of anatomy.
8. Develop basic laboratory techniques relevant to the field of physiology.

## **Gen Ed Common Core Learning Objectives (Goals)**

Students will:

1. Value knowledge and learning.
2. Use the arts, sciences and humanities as a forum for the study of values, ethical principles, and the physical world.
3. Employ scientific reasoning and logical thinking.
4. Gather, interpret, evaluate, and apply information discerningly from a variety of sources.
5. Acquire the tools for lifelong learning – how to learn, how they learn, knowledge of resources.
6. Engage in an in-depth, focused, and sustained program of study.
7. Pursue disciplined, inquiry-based learning in the major.
8. Derive meaning from experience as well as gather information from observation.
9. Understand and employ both quantitative and qualitative analysis to describe and solve problems, both independently and cooperatively.
10. Understand and appreciate the range of academic disciplines and their relationship to the fields of professional and applied study.
11. Demonstrate intellectual honesty and personal responsibility.

## **CUNY 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.

## Laboratory Schedule

<b>Week 1</b>	<p><b>Organization of the Human Body</b>  <i>Review</i> Metric system (xiv – xx)  <b>Ex. 1</b> - The Language of Anatomy            Anatomic Position. Body Orientation and Direction, Body Planes and Sections, Surface Anatomy, Body Cavities, Serous Membranes  <b>Ex. 2</b> - Organ Systems Overview.</p>	<p><b>1 - 10</b></p> <p><b>15 - 24</b></p>
<b>Week 2</b>	<p><b>The Microscope and Its Uses</b>  <b>Ex. 3</b> - Care and Structure of the Compound Microscope,            Magnification and Resolution,            Use of the. Microscope Preparation of a Wet Mount, use protozoa.</p> <p><b>Cell Structure and Division</b>  <b>Ex. 4</b> - The Cell: Anatomy and Division            Cell Division, compare whitefish blastula and onion root tip; Meiosis.  <i>Video</i> – “Mitosis and Meiosis”</p>	<p><b>27 – 34</b></p> <p><b>39 - 48</b></p>
<b>Week 3</b>	<p><b>Transport Mechanisms</b>  <b>Ex. 5</b> – The Cell: Transport Mechanisms and Cell Permeability            Passive Transport: Diffusion, Filtration; Active Transport</p>	<p><b>53 - 62</b></p>
<b>Week 4</b>	<p><b>Basic Tissues of the Body</b>  <b>Ex. 6</b> - Classification of Tissues            Epithelial Tissue; Connective Tissue  <b>Ex. 7</b> - The Integumentary System</p>	<p><b>67 – 86</b></p> <p><b>93- 102</b></p>
<b>Week 5</b>	<p><b>The Skeletal System – I</b>  <b>Ex. 8</b> - Bone Classification and Structure            Bone Markings and Classification            Gross Anatomy of a Typical Long Bone            Microscopic Structure of Compound Bone            Chemical Composition of Bone  <b>Ex. 10</b> - The Appendicular Skeleton</p>	<p><b>107 – 115</b></p> <p><b>149- 162</b></p>
<b>Week 6</b>	<p><b>The Skeletal System - II</b>  <b>Ex. 9</b> - The Axial Skeleton            The Skull; The Vertebral Column; The Thoracic Cage  <b>Ex. 9</b> - The Fetal Skull</p>	<p><b>121 – 140</b></p> <p><b>140</b></p>
<b>Week 7</b>	<p><b>The Skeletal System – III</b>  <b>Ex. 11</b> – Articulations and Body Movements            Fibrous, Cartilaginous, and Synovial Joints; Demonstrating Movements            of Synovial Joints  <i>Review for Bone Practicum</i></p>	<p><b>171 - 184</b></p>

Week 8	<p><b>Organization and Activity of Muscle Tissue</b>  <b>Ex. 6</b> - Histology of the Muscle Types  <b>Ex. 13</b> – Gross Anatomy of the Muscular System – Classification of Skeletal Muscles and Identification of the superficial muscles of the body</p> <p style="text-align: center;"><b>BONE PRACTICUM</b></p>	<p><b>83 – 85</b>  <b>199 - 228</b></p>
Week 9	<p><b>Ex. 12</b> - Microscopic Anatomy, Organization and Classification of Skeletal Muscle  <b>Ex. 14</b> – Skeletal Muscle Physiology: Action Potential; Contraction  Use the Physio-EX CD</p>	<p><b>189 – 194</b>  <b>237 - 252</b></p>
Week 10	<p><b>Histology of Nervous Tissue</b>  <b>Ex. 6</b> - Histology of Nerve  <b>Ex. 15</b>- The Histology of Nervous Tissue, Neuron Anatomy; Classification; Structure of a nerve</p>	<p><b>82- 83</b>  <b>257 - 264</b></p>
Week 11	<p><b>The Nervous System</b>  <b>Ex. 19</b> - The Spinal Cord and Nerves  Use the Physio-EX CD  <b>Ex. 21</b> - Human Reflexes</p>	<p><b>311 – 322</b>  <b>339 - 348</b></p>
Week 12	<p><b>The Brain and Cranial Nerves</b>  <b>Ex. 17</b> - Gross Anatomy of the Brain and Cranial Nerves  Dissection of the Sheep Brain  <i>Video</i> – “The Hidden Universe”.</p>	<p><b>279 - 296</b></p>
Week 13	<p><b>Special Senses – Vision</b>  <b>Ex. 23</b> – Special Senses: Vision  Anatomy of the Eye; Dissection of Cow (sheep) eye  <b>Ex. 24</b> - Visual Tests and Experiments  <i>Video</i> – “The Eye and Ear”</p>	<p><b>361 – 368</b>  <b>373 - 378</b></p>
Week 14	<p><b>General Sensation &amp; Special Senses - Hearing and Equilibrium</b>  <b>Ex. 22</b> - General Sensation  Structure of General Sensory Receptors  Receptor Physiology; Distribution and Localization of Receptors  Adaptation to Touch and Temperature  Referred Pain; <i>Video</i> – “The Moving Parts”  <b>Ex. 25</b>- Special Senses: Hearing and Equilibrium; Anatomy of the Ear  <b>Ex. 26</b> – Special Senses: Taste and Olfaction</p>	<p><b>353 – 358</b>  <b>383 – 393</b>  <b>399 - 404</b></p>
Week 15	<p><b>Practical Exam</b>  <b>(Gross Skeletal Muscle; CNS – Brain and Special Senses (Eye &amp; Ear))</b></p>	

**Practical Exams are required on the Skeleton (Lessons for weeks 3, 4, and 5); Gross Body Musculature (Ex. 13); and the Brain and Eye (Ex. 19 and 24). For review, students should use *Review Sheet pages* at the end of each exercise.**

## Lecture Schedule

<b>Week 1</b>	<p><b>Anatomy &amp; Physiology</b>            Definition            Control and Homeostasis</p> <p><b>Organization and the Body</b>            Levels. of Organization            Anatomical Terms, Body Regions, Cavities, Planes</p>	<b>Chapter 1: 1 - 26</b>
<b>Week 2</b>	<p><b>Chemical Level of Organization:</b>            States of Matter            Components of Matter            Ions – distribution and functions            Salts – distribution and function of electrolytes NaCl,            pH and buffers            Water - properties            Cytoplasm</p>	<b>Chapter 2: 27- 64</b>
<b>Week 3</b>	<p><b>Cellular Level of Organization</b>            Generalized Animal Cell; Organelles            Membranes Transport            Cell Division            Protein Synthesis            Energy Production</p>	<b>Chapter 3: 65 - 113</b>
<b>Week 4</b>	<p><b>Tissue level of Organization</b>            Epithelial Tissue; Connective Tissue; Muscle Tissue; Nervous Tissue            Membranes            Tissue Injury &amp; Aging            Skin</p>	<b>Chapter 4: 114 – 151;</b>  <b>Chapter 5: 152 - 179</b>
<b>Week 5</b>	<p><b>Skeletal System Anatomy</b>            Bones Development            Classification of Bones, Histology            Appendicular Skeleton, Axial Skeleton and Articulations (<b>done in lab</b>)</p>	<b>Chapter 6: 180 -207</b>
<b>Week 6</b>	<p><b>Bioelectricity</b>            Membranes Potentials            Bioelectricity</p>	<b>Chapter 3: 99, 102;</b> <b>Ch. 12: 402 – 416</b>
<b>Week 7</b>	<p><b>Muscular System</b>            Muscle Tissue            Muscle Physiology</p>	<b>Chapter 10: 291 – 335</b>

<b>Week 8</b>	<b>Neurophysiology</b> Nervous Tissue Anatomy and Physiology of Neurons	<b>Chapter 12:</b> 392 - 399
<b>Week 9</b>	<b>Neurophysiology</b> Synaptic Communication Neuromuscular Junctions	<b>Chapter 12:</b> 416 - 432
<b>Week 10</b>	<b>The Spinal Cord</b> Structure and Functions: Distribution and Function of Spinal Nerves and Plexi Reflexes	<b>Chapter 13:</b> 433 – 464
<b>Week 11</b>	<b>The Brain</b> Structure and Functions Cranial Nerves	<b>Chapter 14:</b> 465 – 511
<b>Week 12</b>	<b>Nervous System Pathways and Processing</b> Sensory Pathways: Motor Pathways	<b>Chapter 15:</b> 512– 533
<b>Week 13</b>	<b>Nervous System Pathways and Processing</b> Higher Order Functions (speech, memory, etc.), Brain chemistry, Behavior, and aging:	<b>Chapter 16:</b> 552 – 564
<b>Week 14</b>	<b>Autonomic Nervous System</b> Organization and Functions: Visceral Autonomic reflexes	<b>Chapter 16:</b> 535 – 552
<b>Week 15</b>	<b>The Sense Organs</b> Sensory Mechanisms Cutaneous sensation Visceral sensation Chemical senses	<b>Chapter 17:</b> 565 – 609

**The chapter review (Study Outline) at the end of each chapter is a good place to start the assigned reading for a particular topic. For review, students should use the *Review Questions* at the end of each chapter and other useful resources available.**

## **ACADEMIC INTEGRITY POLICY STATEMENT**

Students and all others who work with information, ideas, texts, images, music, inventions, and other intellectual property owe their audience and sources accuracy and honesty in using, crediting, and citing sources. As a community of intellectual and professional workers, the College recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and at New York City College of Technology and is punishable by penalties, including failing grades, suspension, and expulsion. The complete text of the College policy on Academic Integrity may be found in the catalog.

## **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 or <http://www.citytech.cuny.edu/accessibility/>. Students with medical issues that prevent them from attending classes or causes them to miss assessed work should submit copies of the medical excuse from their health provider or facility to the Center for Student Accessibility for processing and NOT the instructor or department.

## Grading Policies

Students' performance on this course will be evaluated as follows:

Lecture: 60% of final grade (based on 4 exams)

Lab: 40% of final grade, based on a minimum of 4 quizzes, and 2 practical examinations (Skeleton and Human/Sheep's Brain and Eye)

ASSIGNMENTS		POINTS	NOTE	
<b>Lab Quizzes</b>	Minimum 4 Quizzes	40%	Letter grades will be determined using a standard percentage point evaluation as outlined below:  <b>A:</b> 93-100 <b>A-:</b> 90-92.9 <b>B+:</b> 87-89.9 <b>B:</b> 83-86.9 <b>B-:</b> 80-82.9 <b>C+:</b> 77-79.9 <b>C</b> 70-76.9 <b>D:</b> 60-69.9 <b>F:</b> Below 60	
	2 Practical Exams – (Skeleton, Human/Sheep Brain and Eye)			
<b>Lecture Exam</b>	Exam 1	15%	<b>Percentage Category:</b>	
	Exam 2	15%	<b>Exams</b>	60%
	Exam 3	15%	<b>Lab Quizzes and Practical Examinations</b>	40%
	Exam 4	15%		