

**HUMAN BIOLOGY**

**COURSE SYLLABUS FOR BIO 1100**

**COURSE COORDINATOR: Professor A. Zameer**

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**COURSE DESCRIPTION:** This course will include selected biological concepts, including the chemical basis of life, cell structure and division, a broad survey of the major systems of the human body with a special emphasis on human health disease, human evolution and ecology. This course should provide students who do not plan to continue in the sciences or pre-health programs with a working knowledge of life science that will be useful in making informed decisions on health and the environment.

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**COURSE CO/PREREQUISITE (S):** CUNY proficiency in reading, writing (or concurrent enrollment in ENG 092W, ESOL 021W, or ESOL 031W) and math (or concurrent enrollment in MAT 0650).

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**Textbook:** Human Biology by S. Mader and M. Windelspecht, 2013, McGraw Hill [Text and Lab Manual combined]

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**SEQUENCE OF TOPICS AND TIME ALLOCATIONS**

	<b>Lecture Topic</b>	<b>Lab Exercise</b>
<b>Week 1</b>	Introduction: What is biology? The Process of Science [ Pages 1-14]	The scientific method: Problem worksheet [Pages 15-22]
<b>Week 2</b>	Chemistry of Life; Cell Structure and Function [Pages 23-45]	Use of Microscopes; Wet mount slides of biological specimens, Cell structure: Prokaryotes and Eukaryotes [Pages 47-62]
<b>Week 3</b>	Cell division: Cancer and Apoptosis [Pages 63-80]	Mitosis and Meiosis: Slides and Video [Pages 81-98]
<b>Week 4</b>	Organization and regulation of body	Tissues and Organs: Slides and Charts projected on-

	systems: Homeostasis in health and disease [Pages 99-122]	screen (demonstration) [Pages 123-136] <b>Exam 1</b>
<b>Week 5</b>	Cardiovascular system: Heart and Blood Vessels; Cardiovascular diseases [Pages 137-158]	Dissection of rat circulatory system [Pages 174-181]; Blood pressure measurements. [Pages 159-172]
<b>Week 6</b>	Blood [Pages 183-197], Lymphatic system and Immunity: Vaccines and disease; Autoimmunity [Pages 213-230]	Morphology of Blood cells as seen on slides of blood smear; blood typing and blood groups of the ABO system and Rh factor (group experiments) [Pages 199-212]
<b>Week 7</b>	Respiratory System: Smoking and Lung disease [Pages 231-250]	Dissection of rat respiratory system [Pages 251-256]
<b>Week 8</b>	Digestive system and nutrition: Health and diet [Pages 257-271]	Dissection of rat digestive system [Pages 279-287]; Enzymatic assay of starch digestion by salivary amylase [Pages 273-278]
<b>Week 9</b>	Skeletal system: Osteopenia and Osteoporosis [Pages 289-310]	Models of human skeletal system, bones [Pages 312-329] <b>Exam 2</b>
<b>Week 10</b>	Muscular system: Voluntary versus involuntary control [Pages 330-353]	Examination of Slides of skeletal muscle tissue, cardiac muscle tissue and smooth muscle tissue [Pages 354-371]
<b>Week 11</b>	Nervous system; Ageing and diseases of the brain [Pages 374-401]	Brain anatomy; Sheep brain dissection [Pages 402-409]
<b>Week 12</b>	Endocrine system: Hormonal regulation of blood glucose levels in health and diabetes	Video of endocrine control of body physiology; role of hormones in diabetes <b>Exam 3</b>

	[Pages 412-438 ]	
<b>Week 13</b>	Urinary system: Kidney anatomy and urine formation [Pages 442-462]	Dissection of rat urinary system [Pages 464-471]
<b>Week 14</b>	Reproductive system: Contraception; Sexually transmitted diseases [Pages 473-500]	Dissection of rat reproductive system [Pages 502-510]
<b>Week 15</b>	Human evolution [Pages 514-524] and Ecology [Pages 540-547]	Human Evolution [Pages 526-539] <b>Exam 4</b>

**CUNY PATHWAYS INTENDED LEARNING OUTCOMES/ASSESSMENT METHODS**

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT METHODS</b>
<ul style="list-style-type: none"> <li>Identify and apply the fundamental concepts and methods of a life or physical science.</li> </ul>	<p>Students will learn about cell division including mitosis and meiosis and will identify various phases of cell division using prepared slides of cells showing cell division using a compound light microscope. Regulation of cell division will be discussed in the context of normal physiology and diseases like cancer.</p>
<ul style="list-style-type: none"> <li>Apply the scientific method to explore natural phenomena, including hypothesis development, observation, experimentation, measurement, data analysis, and data presentation.</li> </ul>	<p>Students will perform experiments on cardiovascular physiology which will include measuring heart rate and blood pressure and comparing those parameters at rest versus moderate and extreme physical activity. Students will formulate a clear hypothesis, conduct the experiment, collect and analyze the data and present the data.</p>
<ul style="list-style-type: none"> <li>Use the tools of a scientific discipline to carry out collaborative laboratory investigations.</li> </ul>	<p>Students will perform group experiments on blood typing where they will determine the specific blood groups of ABO system and Rh factor using antibodies as specific probes to detect specific antigens on the surface of red blood cells. Students will also study cell morphology and learn to identify specific blood cells based on differential staining and visualizing cells using microscopes.</p>
<ul style="list-style-type: none"> <li>Gather, analyze, and interpret data and present in an effective written laboratory or fieldwork report.</li> </ul>	<p>Students will gather, analyze, and interpret data from three different lab exercises including blood pressure measurements, respiratory measurements using spirometer, and urine analysis of several mock urine samples mimicking both health and disease conditions. Students will present these data in three separate written lab reports.</p>
<ul style="list-style-type: none"> <li>Identify and apply research ethics and unbiased assessment in gathering and reporting scientific data.</li> </ul>	<p>Students will report unaltered data in the lab reports with the use of proper citations to introduce a topic and support their conclusions.</p>

**COURSE INTENDED LEARNING OUTCOMES/ASSESSMENT METHODS**

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT METHODS</b>
<b>1. Students should understand the characteristics of life, organization of living organisms starting from the smallest atom, cell structure and functions.</b>	<b>1. Evaluation of answers on timed exams and quizzes that will include multiple choice, true and false and short answer questions.</b>
<b>2. Students should know the major type of tissues in human body and how these tissues form various organs. Students should also understand the regulation of functions of various organs and how homeostasis is significant in health and disease.</b>	<b>2. Evaluation of answers on timed exams and quizzes. Assessment will include questions that will test students' ability to remember information, understand information, and apply information in certain situations. Questions will include multiple choice, labeling of figures and structures, fill in the blank, true and false, and short answer questions.</b>
<b>3. Students should have a good understanding of the functions of various organ systems in human body with an emphasis on human health and disease.</b>	<b>3. Evaluation of written assignments; students will be required to summarize articles on topics related to human diseases in the context of different organ systems.</b>
<b>4. Students should be able identify parts of the fetal pig anatomy and know the functions of various organs and organ systems.</b>	<b>4. Evaluation of answers on practical midterm and final exams where students will be required to identify and label parts of the fetal pig anatomy.</b>

**GENERAL EDUCATION INTENDED LEARNING OUTCOMES/ASSESSMENT METHODS**

LEARNING OUTCOMES	ASSESSMENT METHODS
<p><b>1. Students should understand the contribution of scientific research in understanding of human diseases and how it affects the society.</b></p>	<p><b>1. Students will be required to read and summarize science articles pertaining to human health and disease taken from popular science magazines and science section of major newspapers. These written assignments will be graded based on rubric:</b></p> <ul style="list-style-type: none"> <li>• <b>Comprehension of the subject matter</b></li> <li>• <b>Ability to summarize the contents in a concise manner using their own words</b></li> <li>• <b>Comprehend the overall significance of the article</b></li> </ul>
<p><b>2. Students should understand the basic principles of human physiology and anatomy in the context of health and disease; this will help students develop critical thinking abilities and application of scientific knowledge.</b></p>	<p><b>2. Students will be evaluated on exams where questions will be based on application of concepts of human physiology and anatomy in various human diseases.</b></p>
<p><b>3. Students should learn how to write scientific lab reports using correct terminology and proper format.</b></p>	<p><b>3. Evaluation of lab reports where the use of correct format will be emphasized. Lab reports will include the following sections; an introduction, materials and methods, results, conclusions and bibliography.</b></p>
<p><b>4. Students should understand the significance of ethical conduct of scientific research.</b></p>	<p><b>4. Evaluation of lab reports will emphasize on reporting of unambiguous raw data and the use of proper citations when referencing other people's work in their reports.</b></p>

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**SCOPE OF ASSIGNMENTS** and other course requirements

Assignments for this course will include written lab reports based on lab exercises and summaries of articles on topics of human health and disease and relevant to the subject material taught in the lecture. Lab reports are intended to provide students with an opportunity to learn how to write technical scientific reports and how to present the scientific data with logical conclusions in a coherent and concise manner. Summary of general science articles (posted on the Blackboard) is intended to provide students with an opportunity to see how biological

principles taught inside the classroom are relevant in the context of human disease and how biologists communicate and share the knowledge with each other and with other members of the community. Lecture material including notes, power point slides, videos, animations, and additional readings will be posted on the Blackboard. Students will be required to use Blackboard extensively to study the lecture material due to limited time for lecture in the class. Lecture exams will include multiple choice questions, fill in the blanks, labeling of structures, and short answer questions.

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**METHOD OF GRADING** – elements and weight of factors determining the students’ grade  
Lecture: 60% and Lab: 40%. The Lecture component will include 4 exams and written assignments. Lab component will include assessment based on written lab reports, class participation, and answering questions based on lab exercises.

<b>Grade</b>	<b>Percentage</b>
A	93-100
A-	90-92.9
B+	87-89.9
B	83-86.9
B-	80-82.9
C+	77-79.9
C	70-76.9
D	60-69.9
F	59.9 and below

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#### **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.

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#### **COLLEGE POLICY ON ABSENCE/LATENESS**

A student may be absent without penalty for 10% of the number of scheduled class meetings during the semester as follows:

<b>Class Meets</b>	<b>Allowable Absence</b>
1 time/week	2 classes
2 times/week	3 classes
3 times/week	4 classes

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