HUMAN ANATOMY
AND
PHYSIOLOGY

SCB-203

La Guardia Community College
City University of New York
Department of Natural Sciences
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A & P Coordinator

Revised 6/2015

Policy on Academic Integrity.

Human Anatomy and Physiology (SCB-203, SCB-204) will be conducted in compliance with La Guardia Community College's Academic Integrity Policy regarding cheating on examinations and quizzes.

If a student is suspected of academic misconduct or dishonesty (such as cheating, bribery or plagiarism) the instructor will complete the academic integrity complaint form. The following steps will then subsequently occur:

- The faculty member meets with the student charged with the violation; shows him/her the completed Complaint Form, which indicates the faculty member's sanction (either an "F" on the paper, quiz or exam involved: or an "F" in the course). The instructor asks the student to check one of the three options printed on the form. The student may select "I do not challenge the accusation and accept the sanctions" or "I challenge the accusation and wish for the matter to be referred to the Chief Adjudicator for further review" or "I do not wish to make any statement at this time and I am aware that the sanction will be upheld without further review for appeal after fifteen days of receipt of this notice".

- The form, with the evidence attached, is then signed by the student and by the faculty member and sent to the Chairperson of the department. The student should be advised that signing of the document is not considered an admission of guilt but only an understanding of the allegations and the possible sanctions filed against them.

- A copy of the form is given to the student and the faculty member retains a copy for his/her files.

- The Chairperson determines whether the matter has been resolved or not; checks the appropriate line on the complaint form; signs the form; files a copy, together with copies of the supporting evidence in the department's files; and sends a copy with the supporting evidence to the Academic Integrity Officer (AIO) in C-317.

- If the alleged violation is discovered after the class has met for the final time in the semester, the instructor notifies the student by e-mail and certified postal mail, requesting a meeting. If the student does not respond, that is so noted on the complaint form and the form with supporting documentation is sent to the department Chairperson, who also attempts to contact the student. If the student does not respond, the form and documents, including documentation of the attempts to contact the student are sent to the AIO.

- If the student checks, "I do not wish to make any statement at this time," or if the student refuses to sign the form at all, or if the student refuses to meet with the professor, the complaint form and attached documents are filed in the department and are sent to the AIO, who calls the student to a meeting and then determines an appropriate course of action, as described above. In cases in which the student fails to appear at the required meeting within one week of notification, the faculty sanction shall apply without benefit of student appeal.

- The AIO functions in these processes as the representative of the Vice President of the Division of Student Affairs. The AIO promptly notifies the Chairperson of receipt of the complaint form, of the determination made by either the Academic Standing Committee or the Student-Faculty Disciplinary Committee and of the inclusion of the student's name in the division's data base of students who admit violations or who are determined to be guilty of violations. The AIO will review the data base to identify repeat offenders and to impose appropriate disciplinary sanctions.

- Finally, when the faculty sanction allows the student to complete work necessary for passing the course, the student is allowed to do so. When the faculty sanction is failure for the course and the student requests a hearing or chooses not to make a statement, the student remains in the course until the matter is resolved. If the matter is not resolved by the end of the term, the professor gives the student a grade that incorporates the proposed sanction, with the possibility of revision when the matter is resolved.

Grading Procedures and Criteria for Human Anatomy and Physiology

The final grade in SCB-203 and SCB-204 is determined by the sum of the lecture and laboratory portions of the course. The lecture composes 60% and the laboratory 40% of the final grade, respectively.

Lecture Exams	% of the Final Grade	Laboratory Exams	% of the Final Grade
6 Lecture Quizzes*	30%	2 Practical Exams	20%
2 Lecture Exams	30%	2 Written Exams[#]	20%
	60%		40%

*The lowest quiz is dropped. [#]The laboratory final in SCB-203 also has a practical portion worth 40% of the grade. There is also a ten point extra credit clay modeling grade in SCB-203.

Practical exams are based on the identification of laboratory materials displayed at stations. Written exams may include short answers, fill-ins, diagrams and essays. Attendance is mandatory for all labs. It is the student's responsibility to make-up missed labs. There are no make-ups for laboratory practical exams and the student must take the exam the week it is offered during the semester.

Final Grades

92.5-100 = A	86.5-89.4 = B+	76.5-79.4 = C+	66.5-69.4 = D+	0-59.4 = F
89.5-92.4 = A-	82.5-86.4 = B	72.5-76.4 = C	62.5-66.4 = D	
	79.5-82.4 = B-	69.5-72.4 = C-	59.5-62.4 = D-	

SCB-203 Information Sheet

Note that that there is a strict **no food, no drink, no smoking and no open toed shoe policy** in the laboratory. Students who fail to comply with these rules may not participate in the laboratory.

Attendance is a requirement for this class. Instructors are required to keep official records of attendance. The maximum number of unexcused absences is limited to 15% of the total number of class hours. Absences are counted from the first day of class even if they are a result of late registration or change of program.

Classes will meet in accordance to the Academic Calendar which may be obtained from the College's web site. Classes may not be cancelled due to inclement weather. Check for announcements on the college's website or CUNYfirst.

Refer to the College Handbook for the rights and responsibilities of students found on the college's web site.

The Grading Policy for these courses are noted above. Repeat, "R", grades are not given in this course and Incompletes, "IN", are issued only under very restricted circumstances. In order to receive an Incomplete, a student must be passing the course and be able to document why he/she is unable to complete the course work during the semester. Both the student and the instructor must complete and sign an Incomplete Form and list the exams that must be completed before a grade is issued. Students have six months to complete the missing exams; otherwise the incomplete is automatically converted to an F grade. An Incomplete does not provide a student with an opportunity to retake exams. All prior grades are retained and added into the calculation of the final grade. Note that the process for an incomplete must be initiated by the student.

SCB-203: HUMAN ANATOMY AND PHYSIOLOGY I
Lecture Syllabus
Text: Human Anatomy and Physiology, First edition by Erin C. Amerman
Pearson (ISBN: XXXXXXXXX)

Lect.	Lecture Topic	Chapters in Amerman
1	Introduction to Human Anatomy and Physiology	Ch 1 (1-11, 21-30, 35-37)
2	Introduction to Chemistry	Ch. 2 (31-36)
3	Reactions and Ionic Bonding	Ch. 2 (36-37, 41-45)
4	Covalent and Hydrogen Bonding	Ch. 2 (37-41)
5	Acids, Bases, and Salts	Ch. 2 (45-50)
6	**LECTURE QUIZ 1**; Introduction to Biochemistry	Ch. 2 (50-52, 62)
7	Lipids and Proteins	Ch. 2 (52-58. 63)
8	Nucleic Acids and Heredity	Ch. 2 (58-67, 63-67)
9	Protein Synthesis	Ch. 3. (102-109)
10	The Cell	Ch. 3 (68-86)
11	Cell Physiology	Ch. 3.(87-102)
12	**LECTURE QUIZ 2;** Epithelial Tissue	Ch. 4 (123-136)
13	Connective Tissue and Organs	Ch. 4 (137-146)
14	Introduction to the Integumentary System	Ch. 5 (160-173)
15	Skin Derivatives and Pathology	Ch. 5 (173-182) and Ch. 5
16	**LECTURE QUIZ 3**; Skeletal Organization	Ch. 6 (183-201), Ch. 4 (144-145)
17	Skeletal Physiology and Articulations	Ch. 6 (201-209), Ch. 8 (257-281)
18	**LECTURE MIDTERM EXAM**	**Lectures 1-17**
19	Muscular Organization	Ch. 10 (339-348), Ch. 4 (146-149)
20	Muscle Physiology	Ch. 10 (348-363)
21	Muscles and Body Movements	Ch 10 (363-373), Ch 9 (290-291)
22	Myopathology	Ch. 9 and Ch. 10
23	**LECTURE QUIZ 4**; Blood Components and Function	Ch. 19 (723-736), Ch. 4 (145-146)
24	Blood Types and Clotting	Ch. 19 (736-751)
25	Blood Pathology	Ch. 19 (731, 733, 747)
26	Structure of the Heart and the Conduction System.	Ch. 17 (631-650), Ch. 4 (146-149)
27	The Electrocardiogram and the Cell Cycle	Ch. 17 (650-660)
28	Control of Cardiac Function and Cardiopathology	Ch. 17 (660-668) and Ch. 17
29	**LECTURE QUIZ 5**; Circulation	Ch. 18 (669-674), Ch. 27 (1072-1075, 1082)
30	Circulatory Physiology	Ch. 18 (674-694)
31	Structure and Mechanics of Respiration	Ch. 21 (799-814)
32	Physiology and Chemistry of Respiration	Ch. 21 (814-834)
33	Regulation of Respiration and Respiratory Disorders	Ch. 21 (835-845) and Ch. 21
34	**LECTURE QUIZ 6**; The Lymphatic System	Ch. 20 (752-760)
35	Immunity (Part I)	Ch. 20 (760-777)
36	Immunity (Part II)	Ch. 20 (777-798)
	LECTURE FINAL EXAM (during finals week)	**Lectures 19-36**

The laboratory syllabus is included in the laboratory manual package if purchased from the college book store. All syllabi may be found on the Department Web Site (**http://www.lagcc.cuny.edu/ns**), A&P Web Site (**http://dev.lagcc.cuny.edu/anatomyandphysiology**) and the E-312 Study Hall Web Site (**https://lagcc-cuny.digication.com/E-312StudyHall**).

SCB-203 – HUMAN ANATOMY AND PHYSIOLOGY I

OUTLINE OF THE LECTURE OBJECTIVES

Lecture 1: Introduction to Human Anatomy and Physiology.

a. How to Succeed in your Anatomy and Physiology Course.
b. Define physiology, cytology, anatomy, histology and pathology.
c. Determine the relationship between structure and function.
d. Compare the levels of structural organization within the human body and define a cell, tissue, organ, organ system and organism.
e. List the characteristics of living things.
f. Explain why homeostasis is a state, which results in normal body activities and why the inability to achieve homeostasis is a condition, which leads to malfunction and related disorders. Give examples of negative and positive feedback mechanisms.

Lecture 2: Introduction to Chemistry.

a. Define energy and matter.
b. Explain using diagrams the Bohr model of the atom of the most commonly elements found in the human body. Define proton, electron and neutron.
c. Explain atomic number, atomic mass, isotope and the organization of the periodic table.
d. Describe the distribution of electrons into energy levels and the octet rule.

Lecture 3: Chemical reactions and ionic bonding.

a. Define a chemical reaction as a function of electrons in incomplete energy levels.
b. Describe chemical and structural formulas, valence electrons and chemical equations.
c. Discuss ionic bond formation in a molecule such as NaCl.
d. Explain anions, cations, ionic compounds, dissociation and electrolytes.
e. Define a chemical bond as a force of attraction among atoms in compounds or molecules.

Lecture 4: Covalent and Hydrogen Bonding and Chemical Reactions.

a. Describe using examples the sharing of outer energy level electrons to form covalent bonds.
b. Define hydrogen bonding and its functions.
c. Explain using examples of biologically important compounds, molecules and free radicals.
d. Identify and compare each of the four types of chemical reactions.
e. Define the type of energy involved when chemical bonds are created or broken.

Lecture 5: Acids, Bases and Salts.

a. List and compare the properties of acids, bases and salts.
b. Define pH as a degree of alkalinity or acidity of a solution.
c. Describe the role of buffer systems as a homeostatic method to maintain the pH of a body fluids.

Lecture 6: Introduction to organic chemistry and biochemistry.

a. **QUIZ 1 (Lectures 1-5).**
b. Define and distinguish between inorganic and organic compounds. Discuss water and salts as

inorganic compounds that are essential to life.
c. Describe the chemical characteristics and functional side groups of hydrocarbons.
d. Discuss the structure and importance of carbohydrates. Compare and contrast mono, di- and polysaccharides.
e. Define polymers and isomers using hexoses as examples.
f. Differentiate between dehydration and hydrolysis reactions of organic molecules.

Lecture 7: Lipids and Proteins.

a. Contrast the chemical structure and functions of neutral fats, phospholipids and steroids.
b. Differentiate between saturated and unsaturated fatty acids.
c. Emphasize the importance of lipids as structural, functional and energy storage molecules.
d. Describe the chemistry of proteins.
e. Emphasize the specific three-dimensional shape of proteins that allow them to function as structural and functional molecules.
f. Define and describe the role of enzymes as organic catalysts.

Lecture 8: Nucleic Acids and Heredity.

a. Define and describe DNA and RNA as polymers of nucleotides.
b. Compare and contrast the structure of DNA and RNA.
c. Define the role of DNA in heredity and protein synthesis.
d. Discuss the mechanism and importance of DNA replication.
e. Define a gene.
f. Describe ATP as an energy storage nucleotide.

Lecture 9: Protein Synthesis.

a. Describe the sequence of events involved in protein synthesis.
b. Describe the function of RNA (mRNA, tRNA and rRNA) in protein synthesis.

Lecture 10: Metabolism and Cell structure.

a. Define and list the parts of a generalized cell.
b. Describe the molecular organization of the cell membrane.
c. List the factors related to the semi-permeability of the cell membrane discussing channels and pumps.
d. Define diffusion, osmosis, filtration, active transport and vesicular transport (endocytosis and exocytosis).
e. Explain how the unequal charge distribution results in a transmembrane potential.

Lecture 11: Cell Physiology.

a. Describe the structure and function of the nucleus.
b. Describe the functions of the cytoplasm.
c. Describe the structure and functions of the smooth and rough endoplasmic reticulum.
d. Define the function of ribosomes.
e. Describe the structure and functions of the Golgi apparatus.
f. Describe the function of the mitochondria as the “powerhouse of the cell”.
g. Explain why a lysosomes are called a “suicide packets”.
h. Describe the structure and function of centrioles in cellular reproduction.

i. Describe the structure and function of the cytoskeleton.

Lecture 12: Tissues and Organs.

a. **QUIZ 2 (Lectures 6-11).**
b. Review the definitions of a tissue and an organ.
c. Classify tissues of the body into the four major types.
d. Compare the distinguishing characteristics of the different types of epithelial tissue.
e. Compare the cell shape and the layering arrangements of epithelial tissue.
f. Describe cell adhesion molecules and the basal lamina as intercellular connections.
g. Define a gland.
h. Distinguish between exocrine and endocrine glands.

Lecture 13: Connective Tissue and Membranes.

a. Describe the distinguishing characteristics of connective tissue.
b. Describe the ground substance, fibers, matrix and the cells that comprise connective tissue.
c. Contrast the different kinds and functions of connective tissues.
d. Define a membrane as an organ.
e. List the location, composition and the function of mucous, serous, synovial, and cutaneous membranes.

Lecture 14: The integumentary System.

a. List the functions of the integumentary system.
b. Define the skin as an organ and a component of the integumentary system.
c. Explain how the skin is structurally divided into epidermal, dermal, and subcutaneous regions.
d. List the structural layers of the epidermis and describe their functions.
e. Discuss the keratinization of the epidermis.
f. Discuss skin color, freckles and tanning.
g. Explain the composition and functions of the dermis.
h. Contrast the structure and function of the papillary and reticular layers of the dermis.
i. Describe the structure and function of the subcutaneous (hypodermis) layer.
j. Classify first, second, and third degree burns.

Lecture 15: Skin Derivatives and Pathology.

a. Compare and contrast the structure and function of epidermal derivatives such as hair, glands (sebaceous, sudoriferous and ceruminous) and nails.
b. Describe the role of the skin in the maintenance of normal body temperature.
c. Explain how the skin functions as an excretory organ and how it repairs itself.
d. Discuss the role of the skin in protecting against disease and desiccation.
e. Explain the effects of aging on the skin and skin cancer.

Lecture 16: Skeletal Organization.

a. **QUIZ 3 (Lectures 12-15).**
b. Describe the organs of the skeletal system.
c. Describe the functions of the skeletal system.
d. Describe the gross features of a long bone.
e. Describe the histological features of compact bone.

f. Compare and contrast the histological features of cancellous and compact bone.
g. Define ossification.
h. Contrast intramembranous and endochondral ossification.
i. Describe the conditions necessary for normal bone growth.

Lecture 17: Skeletal Physiology and Articulations.

a. Compare and contrast the structure and function of tendons and ligaments; define bursa.
b. Discuss diseases of the skeletal system.
c. Define a fracture and briefly describe how bones repair themselves.
d. Define an articulation.
e. Compare and contrast the structure, kind of movement and location of fibrous, cartilaginous, and synovial joints.
f. Describe the detailed structure of a synovial joint.
g. Describe and compare the movements of the different types of synovial joints.
h. Describe the causes and symptoms of common joint disorders that include arthritis, bursitis, tendonitis and intervertebral disc abnormalities.

Lecture 18: **MIDTERM EXAM (Lectures (1-17).**

Lecture 19: Muscular Organization.

a. List the distinguishing properties of muscular tissue.
b. Compare the location, microscopic appearance, nervous control and functions of the three types of muscle tissue.
c. Identify the histological characteristics of skeletal muscle.
d. Define epimysium, perimysium, endomysium and fascia. Explain how these bind muscle fibers into muscle organs and connect muscle to bone.
e. Describe the ultrastructure of skeletal muscle tissue including myofibrils and the sarcomere.

Lecture 20: Muscle Physiology.

a. Describe the source of energy for muscular contraction.
b. Describe the physiological importance of the motor unit.
c. Describe the physiology of contraction by listing the events associated with the sliding-filament model.
d. Define the all or none principle of muscular contraction.
e. Describe the principle of oxygen debt.
f. Describe the structure and function of the neuromuscular junction.

Lecture 21: Muscles and Body Movements.

a. Describe the relationship between bones and skeletal muscles in producing body movements.
b. Define a lever and fulcrum and compare the classes of levers on the placement of the fulcrum, effort and resistance.
c. Describe body movements as the activity of groups of muscles by their roles as prime movers, antagonists and synergists.
d. Describe the process of myography. Define twitch, tetanus, fatigue and rigor mortis.
e. Define recruitment, isotonic and isometric contractions, atrophy and muscle tone.
f. Relate muscle insertion sites to the range of motion of the joint and muscle force.
g. Discuss hypertrophy, atrophy and proprioceptors.

Lecture 22: Myopathology.

a. Define common muscular disorders such as fatigue, fribrosis, myasthenia gravis, muscular dystrophy and TMJ syndrome.
b. Compare spasms, cramps, convulsions and fibrillation as abnormal muscular contractions.

Lecture 23: Blood Components and Functions.

a. **QUIZ 4 (Lectures 19-22).**
b. Contrast the general roles of blood, lymph and interstitial fluid in maintaining homeostasis.
c. Define the physical characteristics of blood (pH, viscosity, temperature and volume).
d. Identify plasma and describe its composition.
e. Describe and compare the origins of the formed elements.
f. Describe the structure of erythrocytes and how they transport O_2 and CO_2.
g. Define erythropoiesis and identify the factors related to erythrocyte production and destruction.
h. List the types and functions of leucocytes.
i. Describe the importance of a differential white count.
j. Discuss the role of leucocytes in phagocytosis and antibody production.
k. Discuss the structure of thrombocytes and explain their role in blood clotting.

Lecture 24: Blood Types and Clotting.

a. Describe the stages involved in blood clotting emphasizing the common pathway.
b. Identify the factors that promote and inhibit blood clotting.
c. Contrast a thrombus and an embolus.
d. Define clotting and bleeding times.
e. Define the classification of the ABO and Rh blood groups.
f. Define the agglutination reaction as the basis for ABO blood symptoms.

Lecture 25: Blood Pathology.

a. Define erythroblastosis fetalis as a harmful antigen-antibody reaction.
b. Compare the clinical symptoms of polycythemia and leukemia.
c. Contrast the causes of hemorrhagic, hemolytic, aplastic, iron deficiency, pernicious and sickle cell anemia.
d. Identify the clinical symptoms of infectious mononucleosis.

Lecture 26: Structure of the Heart and the Conduction System.

a. Contrast the structure of the epicardium, myocardium, and endocardium.
b. Identify the blood vessels, chambers and valves of the heart.
c. Describe the coronary vessels and coronary blood flow.
d. Describe the initiation and conduction of the nerve impulse through the nodal system of the heart.

Lecture 27: The Electrocardiogram and the Cell Cycle.

a. Label and explain the deflection waves of a normal electrocardiogram.
b. Describe the sounds of the heart and their clinical significance.
c. Define systole and diastole as the two principal events of the cardiac cycle.
d. Describe the pressure changes associated with blood flow through the heart.

e. Describe the events of the cardiac cycle as a function of time.

Lecture 28: Control of Cardiac Function and Cardiopathology.

a. Define and identify the factors that determine cardiac output.
b. Define Starling's Law of the heart.
c. Contrast the effects of sympathetic and parasympathetic stimulation of the heart.
d. Define the role of baroreceptors and chemoreceptors in the control of heart rate.
e. Define the role of the medulla oblongata in the control of heart rate.
f. Describe the effects of body temperature, ion concentration, sex, age, hormones and physical conditioning on heart rate.
g. Contrast coronary bypass surgery and transluminal coronary angioplasty.
h. Discuss: congenital heart defects, valve disorders, ischemic heart disease and arrhythmias.
i. Compare angina pectoris and myocardial infarction as abnormalities of coronary circulation.

Lecture 29: Circulation.

a. **QUIZ 5 (Lectures 23-27).**
b. Contrast the structure and functions of veins, capillaries and arteries.
c. Compare systemic, coronary, pulmonary, portal and fetal circulation.
d. Describe the importance and route of blood involved in a portal circulation.
e. Identify the major blood vessels of pulmonary circulation.
f. Contrast fetal and adult circulation.
g. Explain the change in fetal circulatory structures after the establishment of post-natal circulation.
h. Define patent ductus arteriosus and patent foramen ovale and describe their consequences.

Lecture 30: Circulatory Physiology.

a. Describe why blood flows through vessels.
b. List the factors that resist the flow of blood through vessels.
c. List the factors that assist the return of venous blood to the heart.
d. Define pulse and identify the arteries where the pulse may be felt.
e. Discuss blood velocity and exchange of materials in the capillaries.
f. Define blood pressure and discuss the hormonal regulation of blood pressure.
g. Describe the clinical method for recording systolic and diastolic pressure.
h. Contrast the clinical significance of systolic, diastolic and pulse pressures.
i. List the causes and symptoms of aneurysms, arteriosclerosis, and hypertension.

Lecture 31: Structure and Mechanisms of the Respiratory System.

a. Identify the organs of the respiratory system.
b. Describe the olfactory receptors of the nasal cavity.
c. Differentiate between the three regions of the pharynx and describe their roles in respiration.
d. Identify the anatomical features of the larynx related to respiration and vocalization.
e. Describe the structure and location of the tubes that form the bronchial tree.
f. Identify the coverings and the gross anatomical features of the lungs.
g. Describe the role of the respiratory membrane in diffusion of the respiratory gases.

Lecture 32: Physiology and Chemistry of Respiration.

a. List the sequence of pressure changes involved in respiration and expiration.
b. Compare the volumes and capacities of air exchanged in respiration.
c. Define the partial pressures of gases, surfactant and compliance.
d. Describe the mechanisms of external and internal respiration based on differences in partial pressures of O_2 and CO_2.
e. Describe the transport of O_2 and CO_2 by blood and how it is affected by temperature and pH.

Lectures 33: Regulation of Respiration and Respiratory Disorders.

a. Describe the parts of the nervous system that control respiration.
b. Compare and contrast the roles of the Hering-Breuer reflex and the pneumotaxic center in controlling respiration.
c. Describe the effects of chemical stimuli and blood pressure in determining respiration rate.
d. Define bronchial asthma, emphysema, pneumonia, bronchitis, tuberculosis and COPD.

Lecture 34: The Lymphatic System.

a. **QUIZ 6 (Lectures 28-33).**
b. Identify the structures and functions of the lymphatic system.
c. Compare the location, composition and functions of interstitial fluid and lymph.
d. List the forces responsible for the circulation of lymph.
e. Discuss the spleen and thymus as lymph organs.
f. Identify the clinically important groups of lymph nodes and nodules.
g. Describe the structure and function of lymph nodes.
h. Compare and contrast lymphatic vessels with blood vessels.

Lecture 35: The Immune System (Part I).

a. Identify the kinds of specific and nonspecific defenses against infection.
b. Relate the physiological changes and clinical symptoms associated with inflammation.
c. Describe the process of phagocytosis.
d. Contrast B and T lymphocytes with respect to life cycle and function. Identify other cells that function in immune responses such as macrophages and antigen-presenting cells (APCs).
e. Define immunity and discuss how the body recognizes its own cells from foreign matter.
f. Describe the mechanisms of cell-mediated immunity and the development of memory cells.

Lecture 36: The Immune System (Part II).

a. Contrast and provide examples of active and passive immunity.
b. Describe how and why a vaccination works.
c. Describe using examples the immunological basis of autoimmune diseases and the possible cause for the disorders.
d. Explain the allergies, autoimmune diseases and systemic anaphylaxis.
e. Define and describe the terms antigen and antibody; discuss antibody-mediated immunity.
f. Describe the function of antibodies in an antigen-antibody reaction (e.g. complement fixation).
g. Explain the diversity of antibodies.
h. Define the roles of helper T cells and its significance in AIDS.

LAGUARDIA COMMUNITY COLLEGE OF THE CITY UNIVERSITY OF NEW YORK

SCB 203: HUMAN ANATOMY & PHYSIOLOGY I LABORATORY OUTLINE

Required Materials: Dissection Kit, Goggles and Nitrile disposables gloves

Books: ISBN: 978-1-61731-374-5: Exploring Anatomy & Physiology in the Laboratory by Erin C. Amerman, Morton Publishing, Second Edition 2013; A Dissection Guide & Atlas to the Rat by David G. Smith & Michael P. Schenk, Morton Publishing, 2001; An Illustrated Atlas of the Skeletal Muscles by Bradley S. & Joan M. Bowden, Morton Publishing, Fourth Edition 2015.

Lab	Topics	Lab Manual Reading Assignment	Required Handouts	Review Material
1	Introduction, Microscope, Chemical & Physical Principles of Particle Movement	Amerman Unit 4, p. 71- 76 – Particle Movement Unit 3, p 51- 56 – Microscope	The Microscope	Amerman p. 61, 82 (#s 4-7), 83-84 (#s 4-6). p. 57-58
2	Metrics Cell	Amerman Metrics Handout Unit 4, p. 65 – 70 – Cell	The Metric System Vital Capacity	Amerman p. 60-63, 81 (#s 1-3)
3	Mitosis Tissues	Amerman Unit 4, p 77- 80 – Mitosis Unit 5, p. 85- 112 – Tissues		Amerman p. 61, 64, 82 (#s 8-10), 84 (#s 7-8), 113-118
4	**WRITTEN EXAMS ON LABS 1-3** Anatomical Terminology Gross Bone Anatomy & Bone Histology Axial Skeleton	Amerman Unit 1, p 5-6, 17 - Orientation Unit 5, p 98, 100-101 - Histology Unit 7, 135 – 148 - Histology Unit 8, 153 – 185 – Skeleton Bowden p 1-23 and p 326 (Skeleton) Ancillary Illustrations: Fig. A4	Bone List Definition of Bone Markings	Amerman p. 2, 23, 27 p. 149-152 p. 189-200
5	Appendicular Skeleton Fetal Skeleton Articulations	Amerman Unit 8, 153- 188 - Skeleton Unit 9, 201-216 - Articulations Bowden p 1-23 (Skeleton) p 49-68 (Articulations) Ancillary Illustrations: Fig. A4	Bone List Definition of Bone Markings	Amerman p. 154-158, 189-200 p. 217-222

6	**BONE PRACTICAL EXAM ON LABS 4 and 5** Muscle Histology Muscle Organization Introduction to Clay Modeling of Human Muscles	Amerman Ancillary Illustrations: Figs. A1, A2 Unit 5, p 106-109 Unit 10, p 229-234, 240-242 Unit 11, p 249-269 Bowden p. 69-263	Manniken Care Muscle Application List Sculpting Muscles Human Muscles List	Amerman p. 118 (#6), 246 (#10) , 273-280
7	Human Muscles	Amerman Unit 11, p 249-269 Bowden p. 69-263 Ancillary Illustrations: Figs. A1, A2	Manniken Care Muscle Application List Sculpting Muscles Human Muscles List	Video of Human Muscles Amerman p. 273-280
8	Human Muscles	Amerman Unit 11, p 249-269 Bowden p. 69-263 Ancillary Illustrations: Figs.A1, A2	Manniken Care Muscle Application List Sculpting Muscles Human Muscles List	Video of Human Muscles Amerman p. 273-280
9	**MUSCLE PRACTICAL EXAM ON LABS 6-8** Blood Histology & Physiology	Amerman Unit 19, p.463-470, 473-478 Fig 19.4 p.481		Amerman p. 481, 485-486
10	Heart Anatomy and Physiology	Amerman Unit 16, p 385-404, Unit 28, p 688 Smith & Schenk, p. 69-72	Sculpting the Heart	Amerman p. 405-410, 698
11	Vascular Anatomy Arteries and Veins	Amerman Unit 17, p. 411-43	Sculpting the Blood Vessel	Amerman p. 437-442
12	Respiratory Anatomy Respiratory Physiology Spirometry	Amerman Unit 21, p. 509-524 Unit 22, p. 533-544	Sculpting the Respiratory System	Amerman p. 527-532

PRACTICAL AND WRITTEN LABORATORY EXAMS ON LABS 9-12 IS GIVEN DURING FINALS WEEK

***** Note that that there is a strict no food, no drink, no smoking and no open toed shoe policy in the laboratory. Students who fail to comply with these rules may not participate in the laboratory.**

***** Make-up of missed labs and practical exams must be authorized in writing by the student's laboratory instructor with prior permission granted by the host laboratory instructor.**