DEPARTMENT OF BIOLOGY
MEDGAR EVERS COLLEGE of the CITY UNIVERSITY OF NEW YORK

SYLLABUS
BIO 104 *** HUMAN BODY STRUCTURE AND FUNCTION

TEXTBOOKS:

1. Lecture Textbook: Memmler's The Human Body in Health and Disease, by Barbara Janson Cohen and (2005), 10th Edition, Philadelphia, PA; Lippincott Williams and Wilkins.
2. Study Guide: Memmler's The Human Body in Health and Disease, by Barbara Janson Cohen and Kerry L. Hull (2005), 10th Edition, Philadelphia, PA; Lippincott Williams and Wilkins. **A must**
3. Lab textbook: The Human Body in Health & Disease, by Ann Brown, (2003), First Edition, Dubuque, Iowa: Kendall/Hunt Publishing Company

COURSE DESCRIPTION:

This course is an introduction to the body systems and a general description of the normal cellular makeup of the human organs and abnormal (pathological) diseases. It is specifically designed for those who are already working in the health profession or intends to in the future or those who want to gain an overall knowledge of the human body and some of its diseases. The course carries 3 hours of lectures, 3 hours of lab for 4 credits. For the lab component, you will receive a letter grade of "P" or "F". If you fail the course, you will receive "F" in both the lecture and the lab. If you receive a final grade of "INC" in the lecture, you will likewise receive an "INC" as a lab final grade.

As part of reading across the curriculum, each student will be responsible for at least three (3) take-home reading assignments relevant to the topic of discussion to be decided throughout the course. A written summary of each reading must be submitted on the next class period from the date received. Each student will receive grade credit for each assignment.

COURSE REQUIREMENTS:

Reading of the text and lab manual are required to comprehend the principles taught in this course. Attendance is required and will be strictly monitored by each instructor. A student who is absent from a class meeting is responsible for all materials covered and for all announcements made by the professor, including dates and handouts. Students should make every effort to come to class on time, listen to the professor, take good notes, study the textbook, and workout study guide exercises. Students are urged to speak to the professor in the event of problems that need attention. In addition to the office hours, your professor is available for conference before and after each class. **A departmental uniform midterm and final exam will be announced midway through the course and near the end.** You are responsible for all illustrations and terms outlined in the lab manual.

GRADING SYSTEM

Lecture	**25%**	**Laboratory**	**20%**
Midterm	**15%**	**Midterm**	**10%**
Final	**20%**	**Final**	**10%**
	60%		**40%**

BIO 104 **LECTURE OUTLINE**

1. Organization of the human body
   A. Levels of organization - chemical, cell, tissue, organ system, organism.
   B. Body systems: integumentary, skeletal, muscular, nervous, endocrine, circulatory, respiratory, digestive, urinary and reproductive.
   C. Body processes - metabolism, fluid balance, homeostasis.
   D. Directions in the body - directional terms, planes of division
   E. Body cavities: dorsal and ventral.
   F. Metric system.

2. Chemistry, matter and life
   A. What is chemistry, elements, atoms, molecules and components, chemical bonds.
   B. pH scale, isotopes and radioactivity, and organic compounds

3. Cells and their functions.
   A. Studies of cells and the microscope.
   B. Structure of the cell - cell organelles.
   C. Cell functions.
   D. Cells and cancer and their risk factors.

4. Tissues, glands and membranes
   A. Tissue classification: epithelia, connective, muscle, and nervous.
   B. Membranes – epithelial and connective tissue membranes and diseases.
   C. Benign and malignant tumors – symptoms, diagnosis and treatment.

5. Disease and disease-producing organisms
   A. Disease terminology.
   B. Steps in treatment
   C. Microorganisms - single-cell organisms visible only with a microscope.
   D. Parasitic worms – helminths.
   E. Microbial control.
   F. Chemotherapy - treatment with a chemical agent (drug).

6. The skin in health and disease
   A. Structure of the skin
   B. Appendages of the skin
   C. Functions of the skin
   D. Observation of the skin
   E. Skin disorders

7. Skeleton: bones and joints.
   A. Main functions of bones
   B. Bone structure
   C. Bone growth and repair
   D. Bone markings
   E. Divisions of the skeleton
   F. Disorders of bone
   G. Joints - articulations

8. The Muscular System
   A. Types of muscle - smooth, cardiac, and skeletal
   B. Muscular system – functions, structure, contraction, energy and contraction.
   C. Mechanics of muscle movement – attachments, as movers, levers.
   D. Skeletal muscle groups - head, neck, upper extremities, trunk, lower extremities.
   E. Aging on muscles
   F. Muscular disorders.

Departmental uniform midterm - Part I - tba

9. The nervous system, the spinal cord and spinal nerves.
   A. Structure and functional divisions and neuroglia.
   B. Structure of a neuron.
   C. Types of neurons - sensory, motor, mixed nerves, and tracts.
   D. The system at work - synapse, reflex arc.
   E. Spinal cord - location, structure and functions and disorders.
   F. Spinal nerves - 31 pairs.
   G. Autonomic nervous system – divisions and functions with disorders.

10. The nervous system: the brain and cranial nerves.
   A. The brain and its protective structures – layers and cerebrospinal fluid.
   B. Divisions of the brain – cerebrum, diencephalon, brain stem, cerebellum.
   C. Brain studies - CT, MRI, PET, and EEG.
   D. Disorders of the brain.
   E. Cranial nerves - 12 pairs.

11. The sensory system
   A. The senses – special and general senses.
   B. The eye and vision – parts, functions and muscles of the eyeball.
   C. Nerve supply to the eye.
   D. Eye disorders
   E. The ear – outer, middle, inner and disorders of the ear.
   F. Other special senses and general senses.

12. The endocrine system: glands and hormones.
   A. Hormones – functions, chemistry and regulation of hormones.
   B. Endocrine glands and their hormones.
   C. Other hormone-producing tissues.
   D. Hormones and treatment.

13. The blood
   A. Functions of the blood
   B. Blood constituents - plasma, formed elements and their origins.
   C. Hemostasis – prevention of blood loss.
   D. Blood types - ABO blood groups.
   E. Uses of blood and blood components in blood bank and for transfusions.
   F. Blood disorders and blood studies.

14. The heart and heart disease
   A. Circulation and the heart.
   B. Structure of the heart – layers, chambers, valves, and coronary circulation.
   C. Function of the heart – phases, conduction, heart rate and heart sounds.
   D. Heart diseases and the elderly.
   E. Heart studies – instruments used.

15. Blood vessels and blood circulation
   A. Blood vessels – types of blood vessels, blood circuits, blood vessels.
   B. Systemic arteries - the aorta and its parts, iliac arteries, arteries of the head and arm.
   C. Systemic veins - superficial and deep, hepatic portal system.
   D. The physiology of circulation - capillary exchange, the pulse, blood pressure, abnormal
   E. Disorders involving the blood vessels.

16. The lymphatic system and lymphoid tissue
   A. Lymphatic system – functions, lymph, lymphatic capillaries and vessels.
   B. Lymphoid tissue – functions, nodes, tonsils, thymus and spleen functions.
   C. The reticuloendothelial system (RES).
   D. Disorders of the lymphatic system and lymphoid tissue.

17. Body defenses, immunity and vaccines
   A. Factors in the occurrence of infection.
   B. Nonspecific defenses – chemical, phagocytosis, inflammation, fever, interferon.
   C. Immunity – inborn, acquired, antigen-antibody reactions, naturally acquired, artificially acquired immunity.

18. The respiratory system
   A. Components, locations, and functions of the respiratory apparatus.
   B. The process of respiration – pulmonary ventilation, gas exchange and transport, abnormal ventilation and breathing apparatus.
   C. Disorders of the respiratory system.

19. The digestive system
   A. The function and design of the digestive system.
   B. Organs of the digestive tract – mouth, esophagus, stomach, small and large intestines.
   C. Accessory organs – salivary glands, liver, gallbladder and pancreas.
   D. The process of digestion and absorption.

20. Metabolism, nutrition and body temperature
   A. Catabolism and anabolism.
   B. Nutrition guidelines – malnutrition, vitamin and minerals, food allergies, alcohol nutrition and aging.
   C. Body temperature
   D. Normal body temperature and abnormal body temperature.

Departmental uniform final examination – tba

BIOL 104 **LABORATORY SESSIONS**

Laboratory Objectives: To provide a general hands-on understanding of the structure and function of the systems that govern the human organism as taught in the lecture. Lecture material will be reinforced by dissections and other experimentations, such as online computer assignments.

Laboratory Session 1:

Laboratory Safety Guidelines and Introduction into the use of the Lab Manual.
a) Ex. 1 - The Microscope and Laboratory Report
b) Ex. 2 - Mitosis and Meiosis

Laboratory Session 2:

a) Ex. 3 - Movement of molecules across the cell membrane and (lab report)..

Laboratory Session 3:

a) Ex. 4 – Histology: Study of tissues and (lab report).
b) Lab Quiz # 1

Laboratory Session 4:

a) Ex. 5 - Integumentary System - Skin and lab report.
b) Ex. 6 – Skeletal system – appendicular system (pectoral and pelvic girdles and extremities and lab reports.

Laboratory Session 5:

a) Ex. 6 - continued - bony illustrations and figures.
b) Ex..7 – Articulations - Joints

Laboratory Session 6:

a) Ex. 8 – Muscular system (regional muscles of the body) and lab report.
b) Lab Quiz #2

Laboratory Session 7:

a) **Ex.** 9 – Nervous tissue and central nervous system and lab report.
b) Ex. 9 – Peripheral nervous system (cranial nerves, spinal nerves and plexi, reflex arc) and lab report.

Laboratory Session 8:

a) **Departmental Midterm**
b) Ex. 10 – Special senses - Eye and Ear and lab report

Laboratory Session 9:

a) Ex. 10 – Sensory organs (dissection of eye) and senses of balance in ear, lab report.
b) Ex. 11 - Endocrine glands and lab report.

Laboratory Session 10:

a) Ex. 12 – The Circulatory system and lab report.
b) Ex. 12 - Circulatory system - arteries and veins, blood cells and lymphatic structures.

Laboratory Session 11:

a) Ex. 13 - The Respiratory system and lab report
b) Ex. 14 - The Digestive system and lab report.
c) Lab Quiz #3

Laboratory Session 12:

a) Ex. 15 – The Urinary system and lab report
b) Ex. 16 – Reproductive system (male and female), gametogenesis and lab report.

Laboratory Session 13:

a) Anatomy of the cat (review all systems) and lab report.
Departmental uniform final examination – last session of lab