COURSE OUTLINE

BIOL-204

Anatomy and Physiology II

4 Credits

Science Core Course

HOWARD COMMUNITY COLLEGE

Description

This course is a continuation of BIOL-203 and consists of an integrated sequence of physical, chemical and biological principles relating to the circulatory system, respiratory system, digestive system, urinary system, fluid-electrolyte balance, and reproductive system. This course will enable the student to describe the mechanisms of the human body in terms of the structures and functions of the systems studied. The laboratory program will develop an understanding of the interrelationships of the human body systems. The laboratory includes animal and organ dissections as well as work with skeletons, models, slides and experimental studies of physiological processes. Prerequisite: BIOL-203. (3 hours lecture, 3 hours lab)

Statement on General Education and Liberal Learning

A liberal education prepares students to lead ethical, productive, and creative lives and to understand how the pursuit of lifelong learning and critical thinking fosters good citizenship. General education courses form the core of a liberal education within the higher education curriculum and provide a coherent intellectual experience for all students by introducing the fundamental concepts and methods of inquiry in the areas of mathematics, the physical and natural sciences, the social sciences, the arts and the humanities, and composition. This course is part of the general education core experience at Howard Community College.

Overall Course Objectives

Upon completion of this course, the student will be able to:

1. Discuss the functions of blood, and describe its composition and physical characteristics.
2. Discuss the mechanisms used to accomplish hemostasis.
3. Describe the ABO and Rh blood groups and apply these concepts to clinical situations.
4. Discuss the function, location and anatomy of the heart and its blood supply.
5. Discuss the structural and functional properties of cardiac muscle and describe the events of cardiac muscle cell contraction.
6. Discuss the conduction system of the heart, identify the basic elements of an electrocardiogram and their significance, and discuss selected arrhythmias.
7. Describe the timing and events of the cardiac cycle.
8. Define cardiac output, stroke volume and resistance and explain the various factors that are involved in their regulation.
9. Discuss the histology of elastic arteries, muscular arteries, arterioles, capillaries, venules and veins, and discuss their functions.
10. Identify the major arteries and veins of systemic circulation, pulmonary circulation, hepatic portal circulation, and fetal circulation.
11. Define blood flow, blood pressure, mean arterial pressure, resistance, systolic pressure, diastolic pressure and pulse pressure, and explain the relationship between them.

12. Discuss the regulation of mean arterial pressure and blood flow and identify factors that affect them.
13. Outline the factors involved in capillary dynamics, explain the clinical significance of each and apply them to clinical situations.
14. Discuss the functions of the lymphatic system and the structures that comprise it.
15. Discuss the non-specific defenses of the body, including inflammation and the complement system.
16. Discuss specific resistance, including the development of B cells, T cells and macrophages and the mechanism of humoral and cell mediated immune responses.
17. Discuss the functions of the respiratory system, the gross anatomy and histology of the structures that comprise it and their functions.
18. Discuss the mechanism used to accomplish ventilation, external and internal respiration and the transport of gases by the blood and discuss the regulation of these processes and the factors that affect them.
19. Discuss the functions of the digestive system, the gross anatomy and histology of the structures that comprise it and their functions.
20. Discuss how digestive processes are regulated hormonally and neurally.
21. Describe the mechanical and chemical digestion of lipids, carbohydrates and proteins and their absorption.
22. Identify the functions of the urinary system, discuss the gross anatomy and histology of the structures that comprise it and their functions.
23. Discuss the composition of urine and describe the mechanism used for its production.
24. Discuss the location, function and regulation of water, sodium, potassium, chlorine, magnesium and calcium in body fluids.
25. Discuss the role of buffers, the respiratory system and the kidneys in the regulation of acid-base balance in the body and distinguish between acidosis and alkalosis.
26. Discuss the functions of the reproductive system, the gross anatomy and histology of the structures that comprise male and female reproductive systems and their functions.
27. Discuss spermatogenesis, oogenesis, the ovarian cycle, and the uterine cycle and their regulation.

Major Topics

I. Blood
II. The Cardiovascular System: The Heart
III. The Cardiovascular System: Circulation
IV. The Lymphatic System
V. Non-specific Resistance and the Immune System
VI. The Respiratory System
VII. The Digestive System
VIII. The Urinary System
IX. Fluid, Electrolyte and Acid-Base Balance
X. The Reproductive System

Course Requirements

Grading/exams: Grading procedures will be determined by the individual faculty member but will be calculated on the basis of exams, lab practicals and a lab notebook. Lecture and lab quizzes and summarized articles may also be included. This course includes a comprehensive final exam.

Other Course Information

This course is a Science core course, a Science elective and an Arts and Sciences elective.