Course: Human Anatomy and Physiology II /BIO 212

Credits: 4 hrs. credit (3 hours of lectures and 3 hours of lab each week)

Texts: ***Fundamentals of Anatomy and Physiology***, Frederic H. Martini, 10th edition, Prentice Hall Publisher.

Other Required Materials: Dissecting kit, disposable non-latex gloves, lab coat & safety goggles.

Description of the Course:

a) Catalogue Description: A continuation of BIO 211, Human A&P I. The following systems will be covered: endocrine, digestive including nutrition, circulatory, lymphatic, respiratory, urinary including fluids and electrolytes, and reproductive. Human development and topics in human genetics will also be covered. Prerequisite(s): BIO 211 Human A&P I with a C- grade or higher. This is a two-semester course in order to receive knowledge of all of the systems of the human body, students are obligated to complete both semesters of Human Anatomy & Physiology.

b) General Course Objectives:

1) To aid the student in developing an understanding of the life processes as related to humans.

2) To aid the student in developing an understanding of the normal structures and functions of the human body.

3) To provide a useful body of knowledge for studying biology, nursing and other allied health science areas.

Class Attendance Policy:

Attendance of all class activities in lecture and laboratory is required. Absences are counted from the first meeting of class. More than four consecutive or more than six accumulative absences could result in student receiving a "F" grade in this course. An explanation of the cause of all absences should be given to your instructor.

Academic and Classroom Misconduct:

The instructor has primary responsibility for control over classroom and/or laboratory behavior and maintenance of academic integrity, and can request the temporary removal or exclusion from the classroom or laboratory of any student engaged in conduct that violated the general rules and regulations of the institution. Or any student engaged in conduct deemed hazardous in the laboratory. Extended or permanent exclusion from lecture or laboratory activities or further disciplinary action can only be effected through appropriate procedures of the institution.

Plagiarism, cheating on quizzes or tests, or any form of academic dishonesty is strictly prohibited. Students guilty of academic dishonesty directly or indirectly will receive a zero for the exercise or quiz or test and may receive a "F" grade for the course in addition to other possible disciplinary sanctions with may be imposed through the regular institutional procedures. Any student that believes that he or she has been erroneously accused may appeal the case through the appropriated institutional procedure if their grade was affected.

Make-ups:
Any assignment missed can be obtained from the instructor. Lab work may be made up during free time within a week of the missed assignment if the lab is available. Quizzes, scheduled or pop, cannot be made up for any reason. Unit tests can only be made up by special arrangement with the instructor. Makeup tests will be granted on an individual basis only following a conference with the instructor; where the reason(s) for missing the test must be determined mitigating circumstances beyond the control of the student such as, illness, death in the family, or change in condition of employment. All make-up tests will be scheduled during the week of the final exams. If two unit tests are missed during the semester and/or if the final exam is missed the student will receive a "F" grade if he or she is failing other parts of the course or an "I" if the student is passing all other parts of the course.

Revisions to the Syllabus:

Students are responsible for learning all of the objectives and all of the items in the course outline whether they are discussed in lecture and/or laboratory or not. The instructor reserves the right to revise the objectives, topical outline, or academic schedule contained in this syllabus without notice. However, if the revisions affects scheduled unit test a 48 hour notice will be given for the new test date.

Cellular phones and beepers:

Cellular phones and beepers are only allowed in class or lab if they are turned off or in silent mode. Under no circumstance are phones to be answered in class. When there are extenuating circumstances that require that a student be available by phone or beeper, that student must speak to the instructor prior to class, so that together they can arrive at an agreement.

34. The student will be able to explain how carbohydrates, lipids, proteins, and amino acids are utilized by the cells.
35. The student will be able to name the major vitamins needed by the body, give their chemical make up and describe the general function of each.
36. The student will be able to explain the consequences of vitamin deficiencies.
37. The student will be able to name and describe the general functions of the major minerals and trace elements essential to man.
38. The student will demonstrate knowledge of basic metabolism and temperature regulation.
39. The student will demonstrate knowledge of the composition and functions of the blood.
40. The student will be able to distinguish between the various types of cells found in blood.
41. The student will be able to list the major components of blood plasma and give their functions.
42. The student will be able to explain the formation of blood cells and how it is controlled.
43. The student will demonstrate knowledge of the clotting mechanism of blood.
44. The student will be able to explain the basis for blood typing and the methods used to avoid adverse reaction following blood transfusion.
45. The student will be able to describe how blood reaction may occur between fetal and maternal tissues and how such reaction can be prevented.
46. The student will demonstrate knowledge of the heart and blood vessels both structurally and functionally.
47. The student will be able to describe the cardiac conduction system.
48. The student will demonstrate knowledge of the cardiac cycle and the ECG.
49. The student will demonstrate knowledge of the regulation of heart function and blood pressure.
50. The student will demonstrate knowledge of the division of the circulatory system (circulatory circuits).
51. The student will be able to identify and describe the location of the major arteries and veins of the human body in both the pulmonary and systemic circuits.
52. The student will demonstrate knowledge of both hepatic and renal portal systems of circulation.
53. The student will demonstrate knowledge of fetal circulation.
54. The student will be able to define cardiac arrhythmia and describe several forms for arrhythmia.
55. The student will demonstrate knowledge of some disorders of the blood/cardiovascular system.
56. The student will demonstrate knowledge of the structure and function of the lymphatic vessels, nodes, and associated organs.
57. The student will demonstrate knowledge of the composition and circulation of lymphatic fluid.
58. The student will be able to distinguish between specific and nonspecific body defenses and provide an example for each.
59. The student will be able to demonstrate and/or explain how lymphocytes are formed and their role in the immune mechanisms.
60. The student will be able to name the major types of immunoglobulins and discuss their functions.
61. The student will be able to distinguish between primary and secondary immune responses as well as active and passive immunity.
62. The student will be able to explain how allergic reactions and tissue rejection reaction are related to the immune response.
63. The student will demonstrate knowledge of the structure and function of the organs of the respiratory systems and air passageways.
64. The student will demonstrate knowledge of the respiratory musculature and pressure changes produced by their action.
65. The student will demonstrate knowledge of physical and chemical changes associated with oxygen and carbon dioxide transport.
66. The student will demonstrate knowledge of the respiratory volumes and exchanges.
67. The student will demonstrate knowledge of the phases of the respiratory process.

102. The student will be able to explain the physiological and anatomical changes experienced during pregnancy and the birth process.
103. The student will be able to discuss some common methods of contraception.
104. The student will be able to distinguish between growth and development.
105. The student will be able to describe the major events that occur during the period of cleavage.
106. The student will be able to explain how the primary germ layers originate and list the structures produced by each layer.
107. The student will be able to describe the formation and function of the placenta.
108. The student will be able to list and give the functions of the extra-embryonic membranes.
109. The student will be able to define the term fetus and discuss fetal development.
110. The student will be able to trace the general path of blood through the fetal circulatory system.
111. The student will demonstrate knowledge of the Mandolin Laws of the Genetics.
112. The student will demonstrate knowledge of the various forms of gene interaction.
113. The student will be able to describe how chromosomes control the inheritance of sex.
114. The student will be able to describe the patterns of sex-linked traits.
115. The student will be able to define nondisjuction of chromosomes and explain the genetic and/or developmental consequences.
116. The student will be able to discuss some common forms of human genetic diseases.
117. The student will be able to explain the role of DNA and RNA in inheritance.

3) The pharynx
4) The esophagus
5) The stomach
   a) cardiac region
   b) fundic region
   c) the body
   d) pyloric region
   e) gastric glands
6) The pancreas
7) The liver
8) The small intestines
   a) duodenum
   b) jejunum
   c) ileum
   d) villi
   e) lumen
   f) intestinal glands
9) The large intestines
   a) ascending colon
   b) transverse colon
   c) descending colon
   d) rectum
   e) anal canal
   f) anus

2. Nutrition and Metabolism

A) The basic food groups and their biological usage
   1) carbohydrates
   2) lipids
   3) proteins

B) Energy requirements
   1) basal metabolic rate

C) Vitamins
   1) kinds of vitamins and their chemical composition
   2) sources
   3) biological role
   4) disorders of vitamin deficiency

D) Minerals
   1) essential minerals (elements)
   2) trace elements
   3) biological role of minerals

E) Cellular Respiration
   1) glycolysis
   2) kreb's cycle or tca cycle
   3) electron transport or oxidative phosphorylation

2) Lymph
   a) composition
   b) circulation
3) Lymph vessels – structure and function
   a) lymphatic capillaries (lacteals)
   b) lymphatic vessels
   c) lymph nodes (afferent and efferent vessels)
   d) lymphatic trunks
   e) collecting ducts
4) Lymphatic organs -structure and function
   a) nodes
   b) spleen
   c) thymus
   d) tonsils

B) Body defense against infections
1) Nonspecific resistance
   a) species resistance
   b) mechanical barriers
   c) chemical action
   d) interferons
   e) inflammation
   f) phagocytosis
   g) fever
   h) NK cells
2) Immunity
   a) lymphocytes
      1) T-cell system
      2) B-cell system
   b) immunoglobulins, their chemical composition, role in immunity and concentration in the plasma
      1) IgG
      2) IgA
      3) IgM
      4) IgD
      5) IgE
3) Types of Immunity
      a) active immunity
      b) passive immunity
4) Allergies and other disorders of the immune system

3. The Respiratory System

A) The organs and passageways of the respiratory system, their structure and functions.
1) nose and nasal cavity
2) pharynx
3) larynx
4) trachea
5) bronchi and bronchioles
6) alveolar ducts and alveoli
7) lungs

C) The urinary bladder
   1) anatomical location
   2) structural make-up
   3) function

D) The Urethra
   1) anatomical location
   2) structural make-up
   3) function

E) The micturition reflex

2. Water and Electrolyte Balance

A) Fluid compartments
   1) introcellular compartment
   2) extracellular compartments
   3) transcellular compartments

B) The movement of fluids between compartments

C) Water balance
   1) water intake
   2) water output
   3) regulation of water balance

D) Electrolyte Balance
   1) electrolyte intake
   2) electrolyte output
   3) regulation of electrolyte balance

E) Disorders of the water and electrolyte balance
   1) dehydration
   2) water intoxication
   3) edema
   4) sodium/potassium imbalances
      a) hyponatremia
      b) hypernatremia
      c) hypokalemia
      d) hyperkalemia
   5) imbalances of other electrolytes: hypo and hyper concentrations
      a) calcium
      b) magnesium
      c) chlorine
      d) phosphates

F) pH
   1) pH (defined)
   2) sources of hydrogen ions
   3) regulation of hydrogen ion concentration
   4) acid/base buffer system

G) Disorders of the acid/base balance
   1) acidosis, types and causes
      a) respiratory acidosis
      b) metabolic acidosis
   2) Alkalosis, types and causes
      a) respiratory alkalosis
      b) metabolic alkalosis

D) Fetal stage
   1) growth
   2) development
E) Fetal circulation
F) Postnatal period
   1) neonatal
   2) infancy
   3) childhood
   4) adolescence
   5) adulthood
   6) senescence

5. Heredity
   A) Meiosis, chromosomes, genes and heredity
   B) Mendelian inheritance
      1) law of segregation
      2) law of independent assortment
      3) law of dominance
      4) other terms
   C) Crosses
      1) monohybrid
      2) dihybrid
      3) probability
   D) Epistasis
   E) Gene interactions
   F) Sex determining chromosomes
   G) Sex linked traits
   H) Non-disjunction of chromosomes
      1) aneuploidy
         a) trisomic cells
         b) monosomic cells
   I) Quantitative inheritance
      1) polygenes
      2) multiple alleles
   J) Some Human Genetic Disorders