**ESSEX COUNTY COLLEGE**

**Biology and Chemistry Division**

**BIO 122 *–* Anatomy and PhysiologyII**

**Course Outline**

**Course Number & Name:**  BIO 122 Anatomy and Physiology II

**Credit Hours:**  4 .0 **Contact Hours:**  6.0 **Lecture:** 3.0 **Lab:**  3.0 **Other:**  N/A

**Prerequisites**:  Grade of “C” or better in BIO 121

**Co-requisites:** None **Concurrent Courses:** None

**Course Outline Revision Date:**  Fall 2010

**Course Description**: This course builds on Anatomy and Physiology I. Lecture topics include: structure and function of the special sense organs, circulatory system, respiratory system, and digestive system, basic concepts of metabolism, excretory system, water and salt metabolism, and endocrine and reproductive systems. The laboratory experience serves to enhance the topics covered in lectures.

**General Education Goals**: BIO 122 is affirmed in the following General Education Foundation Category: **Scientific Knowledge and Reasoning.** The corresponding General Education Goal is as follows: Students will use the scientific method of inquiry through the acquisition of scientific knowledge.

**Course Goals:** Upon successful completion of this course, students should be able to do the following:

1. explain the fundamental concepts and principles of physiology that are the basis of the molecular, cellular, tissue, organ and systemic levels of the organization of the sensory, cardiovascular, respiratory, digestive and metabolic, excretory, endocrine and reproductive systems;

2. explain the concept of complementarity of structure and function and use this concept to identify the basic structures and functions of the cardiovascular, respiratory, lymphatic and immunological, digestive and metabolic, excretory, endocrine and reproductive systems; and

3. explain the concept of homeostasis and how it applies to the functions of the special senses, cardiovascular, respiratory, lymphatic and immunological, digestive and metabolic, excretory, endocrine and reproductive systems.

**Measurable Course Performance Objectives (MPOs)**: Upon successful completion of this course, students should specifically be able to do the following:

1. Explain the fundamental concepts and principles of physiology that are the basis of the molecular, cellular, tissue, organ and systemic levels of the organization of the sensory, cardiovascular, respiratory, digestive and metabolic, excretory, endocrine and reproductive systems:

1.1 *discuss vision and hearing as related to the physiology of the eye and ear, respectively*;

1.2 *discuss the cellular and noncellular components of blood*;

1.3 *discuss heart function at the tissue and systemic levels*;

1.4 *explain hemodynamics at various levels of organization*;

1.5 *explain internal and external respiration*;

1.6 *discuss gas laws and mechanisms of the transport of gases;*

1.7 *discuss the role played by the variety of leukocytes in the area of immunology;*

1.8 *discuss the location and nature of chemical digestion;*

1.9 *describe basic metabolic events with regard to nutrition and energetic;*

1.10 *describe the principles related to the function of the kidneys at cellular and organ levels;*

1.11 *explain the role of endocrine glands and hormones in the regulation of cellular activity of the cardiovascular, immune, respiratory, digestive and metabolic, excretory and reproductive systems;*

1.12 *explain gametogenesis in both the male and female reproductive systems;* and

1.13 *explain the endocrine regulation and events of the menstrual cycle*

2. Explain the concept of complementarity of structure and function. Use this concept to identify the basic structures and functions of the cardiovascular, respiratory, lymphatic and immunological, digestive and metabolic, excretory, endocrine and reproductive systems:

2.1 *explain how the structure of the eye and ear are related to the function of these organs*;

2.2 *explain how the composition of blood is related to its many functions*;

2.3 *describe the function of the heart in terms of its structure;*

2.4 *discuss the changes in hemodynamics as a function of the different types of blood vessels*;

2.5 *discuss the contributions of the organs of the lymphatic system in terms of their structure/function relationship;*

2.6 *relate the events of ventilation and external respiration to the structure of the airways and lungs;*

2.7 *relate the events of mechanical and chemical digestion to the specific organs of the digestive system and show how structure is adapted to specific functions;*

2.8 *explain the function of the kidney in relation to its structure;* and

2.9 *explain the function of the ovaries and testes in relation to their respective structures*

3. Explain the concept of homeostasis and how it applies to the functions of the special senses, cardiovascular, respiratory, lymphatic and immunological, digestive and metabolic, excretory, endocrine and reproductive systems:

3.1 *explain how the special senses contribute to homeostasis;*

3.2 *discuss adjustments that occur to maintain normal heart rate, blood pressure, perfusion pressure and circulation;*

3.3 *explain adjustments in the rate and depth of respiration and how the respiratory system contributes the maintenance of a normal pH;*

**Measurable Course Performance Objectives (MPOs)** (continued):

3.4 *explain the feedback mechanisms that maintain the optimum events of chemical and mechanical digestion;*

3.5 *name some of the metabolic events that are necessary to maintain normal body temperature or normal blood sugar;*

3.6 *explain the contributions of the liver to the maintenance of normal levels of carbohydrates, proteins and lipids, as well as vitamins and minerals in the blood and other tissues;* and

3.7 *identify the endocrine glands and their respective hormones that contribute to the regulation of corresponding systems in the maintenance of homeostasis*

**Methods of Instruction**: Instruction will consist of a combination of lectures, laboratory experiments, general class discussion, and individual study.

**Outcomes Assessment:** All test questions are blueprinted to course objectives. Data is collected and analyzed to determine the level of student performance on these assessment instruments in regards to meeting course objectives. The results of this data analysis are used to guide necessary pedagogical and/or curricular revisions.

**Course Requirements:** All students are required to:

1. Attend class. Absences or late arrivals negatively affect student understanding of the material and, therefore, performance in the course.

2. Complete assigned reading and homework in a timely manner and contribute to class discussions, which will greatly enhance your chance of success in this course. Science cannot be understood without doing a considerable amount of outside study.

3.    Take tests when scheduled. Policies regarding make-up tests are established by individual instructors.

**Methods of Evaluation:** Final course grades will be computed as follows:

**% of**

**Grading Components final course grade**

* **8 Tests** (dates specified by the instructor) **100%**

Tests will show evidence of the extent to which students meet course objectives.

**Academic Integrity:** Dishonesty disrupts the search for truth that is inherent in the learning process and so devalues the purpose and the mission of the College.  Academic dishonesty includes, but is not limited to, the following:

* plagiarism – the failure to acknowledge another writer’s words or ideas or to give proper credit to sources of information;
* cheating – knowingly obtaining or giving unauthorized information on any test/exam or any other academic assignment;
* interference – any interruption of the academic process that prevents others from the proper engagement in learning or teaching; and
* fraud – any act or instance of willful deceit or trickery.

Violations of academic integrity will be dealt with by imposing appropriate sanctions.  Sanctions for acts of academic dishonesty could include the resubmission of an assignment, failure of the test/exam, failure in the course, probation, suspension from the College, and even expulsion from the College.

**Student Code of Conduct:** All students are expected to conduct themselves as responsible and considerate adults who respect the rights of others. Disruptive behavior will not be tolerated. All students are also expected to attend and be on time all class meetings. No cell phones or similar electronic devices are permitted in class. Please refer to the Essex County College student handbook, *Lifeline*, for more specific information about the College’s Code of Conduct and attendance requirements.

**Course Content Outline:** based on the text **Human Anatomy & Physiology**, 8th edition, by Marieb and Hoehn; published by Benjamin Cummings, 2010; ISBN #: 978-8053-9569-3; and laboratory manual **Selected Material from Anatomy and Physiology Short Version**, 7th edition, by Benson, Gunstream, Talaro, and Talaro; McGraw Hill Custom Publishing, 2005; ISBN #: 0-07-322986-5.

**Week Class Topic**

1 The Special Senses – Eye and Ear

2 Blood

3 Lymphatic System and Immunity

**Test I** – Eye and Ear

4 The Heart

**Test II** – Blood, Lymphatics & Immunity

5 Hemodynamics – Blood Vessels and Circulation

6 Hemodynamics (continued)

**Test III** – Arteries, Veins and Fetal Circulation

7 The Respiratory System

**Test IV** – Heart and Hemodynamics

8 The Digestive System

9 Nutrition, Metabolism and Temperature Regulation

**Test V** – Respiratory System

10 The Urinary System and Body Fluids

11 Fluid Electrolytes, Acid-Base Balance

**Test VI** – Digestion, Metabolism, Nutrition & Temperature Regulation

12 The Endocrine System

13 The Reproductive System

**Test VII** – Urinary System & Fluids, Electrolytes, Acid-Base Balance

14 The Reproductive System (continued)

15 Review

**Test VIII** – Endocrine & Reproductive Systems