**Mohawk Valley Community College**

**Utica, New York**

**Course Number BI216**

**Human Anatomy and Physiology 1**

**(4 Credit Hours)**

**Revised Summer 2023**

**Course Outline**

**Course Name: Human Anatomy and Physiology 1 – BI 216**

**Course Credit Hours: C-3, P-3, CR-4**

**I. Course Description**

This course covers the structure of the human organism at the macroscopic and microscopic levels, its function, and the regulatory processes that operate within a living system. It introduces general anatomical, physiological, and chemical organization, and includes discussions of the integumentary (skin), skeletal, muscular, and nervous systems. Laboratories involve vertebrate dissection, the use of human skeletal materials, non-invasive human experimentation, and possibly animal experimentation. In addition, lab exercises will involve the use of a variety of human body representations which could include reference to cadavers, models, histology, plastinated specimens, and videos.

Prerequisite: High School Biology or its equivalent is recommended.

**II. Organization and Procedures**

A. Time Allotment (one semester - 4 credit hours)

 1. Lecture: meets for 2 hours and 45 minutes per week for 14 weeks plus a three-hour comprehensive final exam.

 2. Laboratory: meets for 3 hours and 5 minutes per week for 14 weeks.

B. Teaching Methods

 1. Lecture-discussion

 2. Problem solving activities

 3. Demonstration and audio-visual aids

 4. Supervised laboratory work

 5. Individual on-line assignments

**III. Student Learning Outcomes**

1. The student will be able to demonstrate knowledge of the historical bases of anatomy and physiology as a natural and applied science by describing the scientific contribution(s) of selected significant individuals from the past.

 B. The student will be able to correctly and accurately use anatomical terminology when describing the human and nonhuman structural plan through the completion of a variety of assessments. This outcome will be addressed in lab using human or animal specimens, or anatomical models while completing hands on inquiry based lab exercises.

 C. The student will be able to demonstrate knowledge of homeostasis by completing a variety of assessments that involve organ systems and their role in the maintenance of a stable internal environment.

 D. The student will be able to demonstrate knowledge of atomic structure and its relationship to living matter by completing a variety of assessments.

 E. The student will be able to demonstrate knowledge of basic cellular structure and how it contributes to the four basic tissue types along with the integument by completing a variety of assessments.

 F. The student will be able to demonstrate knowledge of cellular electrophysiology including membrane potential, local potentials, action potential and related topics by completing a variety of assessments.

 G. The student will be able to demonstrate knowledge of the anatomy and physiology of the nervous system through the completion of a variety of assessments.  This outcome will be addressed in lab using human and animal specimens, or anatomical models while completing hands on inquiry based lab exercises.

 H. The student will be able to demonstrate knowledge of the anatomy and physiology of the musculoskeletal system and its contribution to the production of movement by completing a variety of assessments. This outcome will be addressed in lab using human and animal specimens, or anatomical models while completing hands on inquiry based lab exercises.

 I. The student will be able to demonstrate the ability to collect and analyze data in lab and evaluate quantitative information relating to musculoskeletal physiology.

 J. The student will participate in the processes of anatomical observation, anatomical exploration, and anatomical discovery through the completion of a variety of assessments. This outcome will be addressed in lab using human and animal specimens, or anatomical models while completing hands on inquiry based lab exercises.

 K. The student will observe and recognize the significance of the structural

 changes associated with aging and various selected pathologies. This outcome will be addressed in lab using human and animal specimens, or anatomical models while completing hands on inquiry based lab exercises.

 L. The student will observe and verify the anatomical bases for selected

 clinical procedures. This outcome will be addressed in lab using human

 specimens or anatomical models while completing hands on inquiry based

 lab exercises.

 M. The student will compare human morphology between same sex and opposite sex individuals. This outcome will be addressed in lab using human specimens, or anatomical models while completing hands on inquiry based lab exercises.

**General Topic Outline for Lecture – BI216**

**Week Topic**

 1 Introduction: Definitions, Planes of Reference,

Anatomical Terminology, Structural Organization, Organ Systems, Feedback Regulation, Homeostasis

 Introduction (cont'd)

 2 Chemical Level of Organization: Basic Chemistry and Biochemistry

 Chemical Level of Organization (cont'd)

 3 Chemical Level of Organization (cont'd)

 Fluid, Electrolyte, and Acid-Base Balance

 4 Fluid, Electrolyte, and Acid-Base Balance (cont’d)

 First Hour Exam (subject to change)

 5 The Cellular Level of Organization: Plasma membrane, Cytoplasm, and Nucleus

 The Cellular Level of Organization (cont'd)

 6 The Cellular Level of Organization (cont'd)

 Tissues: Epithelial, Connective, Muscle, Nervous,

 Embryonic; Membranes, Gland

 Tissues

 7 Integument: Structure, Function, and Response to Injury

 The Skeletal System: Bone Types,

 Development, Growth, Hormonal Regulation, Response to

 Mechanical Stress, Repair

 8 Skeletal System (cont'd)

 Second Hour Exam (subject to change)

 9 The Muscular System: Muscle Tissue,

 Terminology, Physiology, Energetics

 The Muscular System (cont'd)

**Week Topic**

10The Muscular System (cont'd)

 The Muscular System (cont'd)

11 The Nervous System: Cell Types and Functions,

 Organization, Basic Concepts

 The Nervous System (cont’d)

12 The Nervous System (cont’d)

 The Nervous System (cont’d)

13 The Autonomic Nervous System

 The Autonomic Nervous System (cont’d)

14 The Autonomic Nervous System (cont’d)

 Third Hourly Exam (subject to change)

15 Comprehensive Final Exam

**Laboratory Outline – BI216**

**Week Lab**

Week 1 - DA-1 Themes in Anatomy-1 Directional Terms, Planes and Sections, Body Cavities and Serous Membranes, & Body Landmarks and Reference Lines

Week 2 - DA-2 Themes in Anatomy-2 Human Donor Exploration: Anatomy as a Science

Week 3 - DA-3 Histology: An Introduction to Tissues

Week 4 - DA-4 Human Skeletal System

Week 5 - DA-4 Human Skeletal System

Week 6 - DA-5 Bony Articulations: Shoulder, Hip, Knee

Week 7 - DA-6 Muscles: Anterior and Posterior Thorax

Week 8 - DA-6 Muscles: Anterior and Posterior Thorax

Week 9 – P-1 Electromyography (EMG)

Week 10 – DA-7 Anatomy of Special Sensory Structures: The Eye and the Ear

P-2 Physiology of the Special Sensory Structures: Audition & Vision

Week 11 - DA-8 Anatomy of the Brain: Sheep Brain with Human Comparisons

Week 12 - DA-8 Anatomy of the Brain: Sheep Brain with Human Comparisons

Week 13 – DA-9 Anatomy of Peripheral Nervous System

Week 14 - DA-10 Anatomy of the Central Nervous System: Spinal Cord

DA-11 Peripheral Nervous System: Brachial Plexus