**MOHAWK VALLEY COMMUNITY COLLEGE**

**UTICA AND ROME, NEW YORK**

**COURSE OUTLINE**

**BI 103 Human Life Science**

Reviewed January 2017

May 2018

**Course Name & Number: BI 103 Human Life Science C-3, P-2, Cr-4**

**Course Description:** This course explores the form and function of human body systems for non-science students. It stresses normal and abnormal life processes as well as the philosophy and history of science including the scientific method. Laboratory exercises complement lecture topics, which include the study of cells and tissues, and the nervous, cardiovascular, respiratory, and reproductive systems. Dissections are required in the laboratory.

**Prerequisites:** None.

**Student Learning Outcomes:**

Students will be able to:

* Describe the basic anatomical structures and physiological mechanisms operating in normal cells, tissues, and organ systems covered in the course
* Relate how the structure of the human body, from molecules to organ systems, affects and helps to create the various functions that these structures perform
* Identify how the body maintains normal homeostasis, how these homeostatic mechanisms are disrupted in certain pathologies, and how they can be corrected through medical treatments
* Explain and practice the components of the scientific method and the methods used by scientists in evaluating natural phenomena
* Critically evaluate scientific materials that they encounter in other disciplines and in real life situations

**Major Topics:**

1. **History of Science and the Scientific Method**
   1. Human as a Living Organism
      1. Characteristics of life
      2. Levels of organization
   2. Scientific Process
      1. Scientific method
      2. Critical thinking about scientific materials
      3. Science’s impact on society
2. **Organic Molecules in Relation to the Cell**
   1. Basic structure and function of macromolecules
   2. Hydrophobic/hydrophilic interactions
3. **Cells and Tissues**
   1. Introduction to Cells
   2. Cellular Structure
      1. Plasma membrane
      2. Transport of substances
         1. Osmosis
      3. Cytoplasm
   3. Cellular organelles, structure and function
      1. Endoplasmic reticulum
      2. Ribosomes
      3. Golgi apparatus
      4. Lysosomes
      5. Mitochondria
      6. Nucleus
   4. Cell Division
      1. Mitotic division
      2. Meiotic division and inheritance
      3. Disorders in cell division
         1. Cancer
   5. Genetic Engineering
      1. Cloning
      2. Stem cell research
   6. Tissues (epithelial, connective, muscle, nervous)
      1. Structure
      2. Function
      3. Location
4. **Nervous System**
   1. Structural and Function of Neurons
      1. Action potentials
      2. Neurotransmitters
      3. Synapses
   2. Central Nervous System
      1. Brain
      2. Spinal cord
   3. Peripheral Nervous System
      1. Somatic divison
         1. Reflexes
      2. Autonomic division
         1. Homeostasis of body processes
   4. Sensory Mechanisms
      1. Special senses
      2. Somatic senses
   5. Dysfunctions of the nervous system
      1. Diseases
      2. Drugs and the brain
5. **Cardiovascular System**
   1. Blood
      1. Contents
      2. Functions
   2. Blood Vessels
      1. Structure and function
      2. Blood pressure
   3. Human Heart
      1. Anatomy and circulatory pathway
      2. Physiology
   4. Problems of the Cardiovascular System and Heart
      1. Injuries
      2. Defects
      3. Diseases
6. **Respiration**
   1. Lungs and Airways
      1. Structure
      2. Gas exchange
      3. Mechanics of breathing
   2. Respiration in body tissues
      1. Gas exchange
   3. Disorders of the Respiratory System
7. **Skeletal-Muscular**
   1. Skeleton
      1. Bone growth and development
      2. Bone structure and function
      3. Bone marrow composition and function
   2. Muscles
      1. Muscle protein structure
      2. Process and regulation of contraction
   3. Connective tissues (tendons, ligaments, etc.)
      1. Structure
      2. Function
   4. Disorders of the Skeletal-Muscular Systems
8. **Reproductive System**
   1. Male and Female specific anatomy and physiology
      1. Sperm production
      2. Egg production and the menstrual cycle
   2. Regulation of reproductive hormones
   3. Fertility
      1. Controlling fertility through birth control
      2. Infertility causes and corrections
   4. Sexually transmitted diseases
9. **Other Body Systems** (as time allows)
   1. Immune system
   2. Endocrine system
   3. Digestive system
   4. Urinary system