

**NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
BIO 141 - HUMAN ANATOMY AND PHYSIOLOGY I (4 CR.)**

Course Description

Integrates anatomy and physiology of cells, tissues, organs, and systems of the human body. This course is part I of a two part series. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.

General Course Purpose

This course is an introductory college transfer level offering designed to meet the anatomy and physiology needs of students pursuing programs in a medical or paramedical career, or a degree in physical education.

Course Prerequisites/Corequisites

Prerequisite: Placement into ENG 111.

Course Objectives

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

- diagram and describe the atomic structure of biologically important elements
- explain the principles of chemical bonding and apply those principles to the formation of both inorganic and organic molecules
- describe the composition and organization of water, acids, bases, salts, buffers, carbohydrates, lipids, proteins, and nucleic acids and explain the biological role of each
- describe the fundamental principles involved in chemical reactions and apply them to specific examples
- list the following anatomical terminology
 - the systems of the human body and the organs comprising each system
 - the levels of structural organization
 - directional terms
 - body cavities and their membranes
 - quadrants of the abdominopelvic cavity
 - surface areas of the body
 - sectional planes of the body
- diagram a typical animal cell, label the component parts and explain their functions
- outline the movement of materials across the cell membrane
- compare and contrast mitosis and meiosis
- diagram the types of tissues and state the function of each of the tissue types
- describe the anatomy and physiology of the integumentary system of man
- describe the anatomy of bone and cartilage
- name the major bones of the skeletal system of man and their associated anatomical landmarks
- classify each of the bones according to their shape and then according to the subdivision of the skeletal system to which they belong
- list the signs, symptoms, and complications of a fracture. Then describe the type of fractures
- list the major types of joints and their several subtypes
- list the major muscles of the muscular system and state their location, origin, insertion, action, and innervation

- list the types of muscle tissue and describe their location, appearance, and physiology
- describe the structure of the motor unit and identify the mechanism whereby the neuron activates the muscle cell and the mechanism whereby the muscle cell contracts
- discuss the anatomy and physiology of the nervous system of man and related clinical disorders
- explain neuronal and synaptic transmission
- describe the anatomy and physiology of the special senses of man

Major Topics to be Included

- Chemical and physical aspects of life
- Structure and function of cells and tissues
- Cellular energetics
- Basic anatomical terminology
- Mitosis versus meiosis
- Anatomy and physiology of the integumentary system
- Anatomy and physiology of the skeletal system
- Anatomy and physiology of the muscular system
- Anatomy and physiology of the nervous system and special senses