NVCC 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. 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.

ENTRY LEVEL COMPETENCIES

The student should have an expressed interest in biology and be able to read and express himself orally and in writing. Although it is desirable to take the courses, BIO 141 and BIO 142 - "Human Anatomy and Physiology I & II", in sequence, it is not essential. Accordingly, a student can enroll in these courses in any sequence they choose.

COURSE OBJECTIVES

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

A. diagram and describe the atomic structure of biologically important elements
B. explain the principles of chemical bonding and apply those principles to the formation of both inorganic and organic molecules
C. describe the composition and organization of water, acids, bases, salts, buffers, carbohydrates, lipids, proteins, and nucleic acids and explain the biological role of each
D. describe the fundamental principles involved in chemical reactions and apply them to specific examples
E. list the following anatomical terminology
   1. the systems of the human body and the organs comprising each system
   2. the levels of structural organization
   3. directional terms
   4. body cavities and their membranes
   5. quadrants of the abdominopelvic cavity
   6. surface areas of the body
   7. sectional planes of the body
F. diagram a typical animal cell, label the component parts and explain their functions
G. outline the movement of materials across the cell membrane
H. compare and contrast mitosis and meiosis
I. diagram the types of tissues and state the function of each of the tissue types
J. describe the anatomy and physiology of the respiratory system of man and related clinical disorders
K. discuss the composition of human blood and the functions of each of the individual constituents
L. describe the anatomy and physiology of the integumentary system of man
M. describe the anatomy of bone and cartilage
N. name the major bones of the skeletal system of man and their associated anatomical landmarks
O. classify each of the bones according to their shape and then according to the subdivision of the skeletal system to which they belong
P. list the signs, symptoms, and complications of a fracture. Then describe the type of fractures
Q. list the major types of joints and their several subtypes
R. list the major muscles of the muscular system and state their location, origin, insertion, action, and innervation
S. list the types of muscle tissue and describe their location, appearance, and physiology
T. 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

**MAJOR TOPICS TO BE COVERED**

A. Chemical and physical aspects of life
B. Structure and function of cells and tissues
C. Cellular energetics
D. Basic anatomical terminology
E. Mitosis versus meiosis
F. Anatomy and physiology of the respiratory system
G. Anatomy and physiology of the circulatory system
H. Hematology
I. Anatomy and physiology of the integumentary system
J. Anatomy and physiology of the skeletal system
K. Anatomy and physiology of the muscular system
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COURSE OBJECTIVES

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

A. discuss the anatomy and physiology of the nervous system of man and related clinical disorders
B. explain neuronal and synaptic transmission
C. describe the anatomy and physiology of the special senses of man
D. discuss the organs of the endocrine system, their secretions, the functions of these secretions, the control of these secretions, and their target organs. Explain common related clinical disorders
E. describe the anatomy and physiology of the male and female reproductive systems
F. discuss the phases of the menstrual cycle and the hormones associated with each phase
G. explain the sequence of events in protein synthesis
H. solve genetic problems involving monohybrid and dihybrid crosses, blood types, se-linked traits and sex influenced traits
I. describe the anatomy and physiology of the digestive system of man
J. list the enzymes and hormones involved in digestion and state their functions
K. describe the anatomy and physiology of the urinary system of man and related clinical disorders
L. explain fluid and electrolyte balance in the human body and related clinical disorders
M. explain the anatomy and physiology of the immune system
MAJOR TOPICS TO BE COVERED
A. Anatomy and physiology of the nervous system
B. Anatomy and physiology of the endocrine system
C. Anatomy and physiology of the reproductive system
D. Protein synthesis
E. Meiosis and Genetics
F. Digestion
G. Anatomy and physiology of the urinary system
H. Fluid and electrolyte balance
I. Immunity