Course Description
Integrates the study of gross and microscopic anatomy with physiology emphasizing the analysis and interpretation of physiological data. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.

General Course Purpose
The purpose of this college transfer course is to provide the student with an opportunity to study the bodily structure through anatomical studies and the fundamental biological, chemical, and physical principles that govern the physiology of the human body.

The course is designed for students pursuing programs in pre-medicine, pre-dentistry, nursing, physical therapy, physical education, medical technology, selected paramedical areas, and biology.

Course Prerequisites/Co-requisites
Prerequisite is BIO 231 or division approval.

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

Cardiovascular - Circulatory & Lymphatic
- describe the components of the blood, plasma and formed elements, and functions of each
- identify the major parts of the heart, forces necessary to circulate blood through the heart, and factors that influence the efficiency of functioning
- identify the major subdivisions of the circulatory system, respective major vessels, and the organs served
- distinguish between veins, arteries, and capillaries in terms of structure and function
- explain the principal factors that affect blood flow throughout the circulatory system
- identify the major organs of the lymphatic system and their roles
- describe the formation of lymph and trace its pathway to enter the circulatory system
- relate the major immunological functions of the T- and B-lymphocytes

Respiratory System
- describe the anatomy of the respiratory system
- explain the physical mechanisms and controls that regulate gas exchange between:
  - environment and lungs
  - lungs and blood
  - blood and tissues
- discuss the chemical transport of the gases in the blood and role in the buffering action of the blood
**Digestive System & Metabolism**

- trace the digestion of the major food groups through the digestive system by identifying:
  - the organs transversed
  - mechanical and chemical events involved in digestion
  - mechanisms of absorption
  - factors that regulate the motility and elimination
- describe the structure of the accessory digestive organs and their roles in the digestive processes
- describe the intermolecular conversion between the carbohydrate, lipid, and protein pools
- using glycolysis, Krebs citric acid cycle, oxidative phosphorylation, beta-oxidation, transamination, and deamination, explain the energetics of foods and nutrients
- explain the role of hormones in the control of the metabolic processes

**Urinary System, Fluid & Electrolyte Balance, Acid-Base Balance**

- describe the organs of the urinary system and their functions
- explain the processes involved in the formation of the filtrate, tubular reabsorption and secretion, and urine concentration
- compare the physical and chemical characteristics of plasma, filtrate and urine
- explain the mechanisms of control of the major electrolytes found in the body
- explain the mechanisms of fluid regulation - intake, tissue exchange, and output
- define pH and major sources of hydrogen and basic ions
- describe the major buffering systems and how they control the pH of the body fluids
- distinguish between acidosis and alkalosis and discuss their treatment

**Reproductive System & Embryology**

- Explain the major events of meiosis and their consequences in spermatogenesis and oogenesis
- identify the major structures and functions of the male genital system and trace the path of sperm from their origin to exit from the body
- explain the control mechanisms that regulate male fertility
- describe the primary and secondary organs of the female reproductive system and their functions
- describe the female sexual cycles and their control mechanisms
- identify and describe the events of ovulation, fertilization and implantation
- describe the formation and significance of the placenta
- trace the formation of the three embryonic tissue types and their derivatives.
- Describe the development and biological importance of the extraembryonic membranes
- discuss the major events and structure susceptibilities during the three trimesters
- describe the birth process and the assessment of the newborn

**Major Topics to be Included**

- Circulatory and lymphatic systems
- Respiratory system
- Digestive system and metabolism
- Urinary system, fluid and electrolyte balance, and acid-base balance
- Reproductive system and embryology
Laboratory topics and activities should be parallel with the lecture topics with emphasis upon:

- Comparative studies using cat dissection
- Observational studies using models of the human body
- Microscopic studies
- Physiographic exercises

**Optional Topics**

- Micro pathology
- Treatment modalities
- Diagnostic procedures