SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: BIOL 104 Department: Biological Sciences

Course Title: Human Biology 1 Semester: Spring Year: 1997

Objectives/Competencies

Course Objective	Competencies
1. Basic organization of human body and the relationship between structure (anatomy) and function (physiology).	1. Define anatomy and physiology. 2. Describe levels of organization and major characteristics of life. 3. Discuss importance of energy sources and needs. 4. Define homeostasis, discuss its importance to life, and feedback mechanisms of control. 5. Describe location of body cavities, membranes associated with each and organs within each one. 6. Name organs, systems, and list functions of each. 7. Describe body positions, body planes, body regions and anatomical position.
2. Chemical basis of life.	1. Explain relationship between living material and its chemical composition. 2. Define atom and element, subatomic particles and how they are organized.

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	3. Define relationships between matter, atoms and molecules and how atomic structure determines atom interaction. 4. Describe types of chemical bonds. 5. Describe pH scale and explain importance of buffers. 6. Describe 4 types of organic molecules and their functions and discuss inorganic molecules, acids, bases and salts.
3. Cellular level of organization in body.	1. Describe a composite animal cell and describe function and structure of all organelles. 2. Describe structure of plasma membrane & passive and active mechanisms of membrane movement. 3. Discuss role of osmotic pressure and compare hypo, hyper and isotonic solutions. 4. Understand process of mitosis and cytoplasmic division of cells. 5. Understand protein synthesis with knowledge of DNA/RNA structure, transcription and translation processes.
4. Organization of cells into groups and layers called tissues and membranes.	1. Describe general characteristics and functions and locations of epithelial, connective tissues. 2. Define and categorize glands. 3. Describe and locate mucous and serous membranes. 4. Describe structure and function of cutaneous membrane and how it functions as the body's largest organ.
5. The Lymphatic System and Immunity with a basic knowledge of Microbiology.	1. Describe and discuss morphology and classification of

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	bacteria and viruses. 2. Understand Bacterial reproduction, requirements for growth, life cycle of viruses, infectious diseases and role of microbes in their appearance. 3. Explain dispersal, invasion and pathogenicity factors in disease occurrence, stages of disease, reproductive curve of bacteria and routes of exit from body. 4. Discuss normal flora found on body, opportunists and symbionts. 5. Understand all types of immunity, non-specific and specific, passive and active, plus allergic and tissue rejection responses. 6. Describe all structures of lymphatic system, its function, flow, and relationship tedium. 7. Describe processes of culturing and staining bacteria, and destruction of microorganisms to affect their control.
6. Role of Blood in Circulatory System of body.	1. Describe blood characteristics and functions. 2. Name plasma components and functions. 3. Name and distinguish between all blood cells, and their function. 4. Explain RBC production and control. 5. Explain major steps in blood coagulation. 6. Understand basis for blood typing and possible adverse blood reaction.
7. Heart and Blood Vessels which form the Cardiovascular System.	1. Name, describe all parts of heart and understand function of each part.

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	2. Trace path of blood through heart and vessels in and out of heart. 3. Understand cardiac cycle and cardiac conduction system and its relationship to ECG pattern. Discuss significance of this pattern. 4. Explain how heart sounds are produced. 5. Discuss control of heart rate. 6. Compare structures and functions of arteries, capillaries and veins. 7. Explain Blood Pressure and resistance to flow and how BP is controlled. 8. Describe exchange of material in capillary beds. 9. Identify and locate major arteries and veins of pulmonary and systemic circuits. 10. Understand Circle of Willis, Hepatic Portal System and Fetal Circulation. 11. Understand peripheral resistance, pulse pressure and nervous system and hormonal control of circulation.
8. Urinary System's ability to remove nitrogenous and other wastes from blood and to regulate Fluid and Electrolytes and pH of body and to control RBC production and Blood Pressure.	1. List organs of urinary system and discuss general functions. 2. Describe location and anatomy of kidney. 3. Trace pathway of blood through kidney. 4. Describe nephron and explain functions of all parts. 5. Describe composition of glomerular filtrate, role of tubular reabsorption and secretion and composition of urine.

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	6. Discuss importance of Fluid and Electrolyte balance and describe and locate fluid compartments. 7. List routes of entrance and exit of F & E. 8. Describe strong and weak acids and bases, role in buffer systems and explain pH control by chemical buffers, respiratory system and the kidneys.