

**HIBBING COMMUNITY COLLEGE
COURSE OUTLINE**

COURSE NUMBER & TITLE: BIOL 1280: Human Anatomy and Physiology:
Internal Organ Systems

CREDITS: 4 (3 Lec / 1 Lab)

PREREQUISITES: None

CATALOG DESCRIPTION:

Human Anatomy and Physiology 2 is the study of organ systems and tissues of the human body. Systems included are the cardiovascular, respiratory, lymphatic, digestive, urinary, and reproductive. The focus is on structure and the integrated control mechanisms of physiology in these systems. This course is intended for students in health-related fields as well as liberal arts students.

MNTC goal area: (3) Natural Science.

OUTLINE OF MAJOR CONTENT AREAS:

- I. Overview of anatomy and physiology
 - A. Structural organization
 - B. Functional characteristics
 - C. Homeostasis
- II. Basic chemistry and biochemistry
 - A. Bonds and reactions
 - B. Acids, bases, and salts
 - C. Organic compounds
- III. Cells and tissues
 - A. Membranes
 1. Transport
 2. Electrical potential
 3. Cell interactions
 - B. Epithelium
 1. Type
 2. Location
 3. Function
 - C. Connective tissue
 - D. Blood
 1. Composition
 2. Formed elements including cells
 3. Plasma
 4. Hemostasis
- IV. Cardiovascular system
 - A. Heart anatomy
 - B. Heart physiology
 1. Electrical events
 2. Heart sounds and contraction
 3. Cardiac output

- C. Blood vessels
 1. Arteries, capillaries, and veins
 2. Blood flow, pressure, and resistance
 3. Circulatory pathways
- V. Lymphatic system
 - A. Lymphatic vessels
 - B. Lymph nodes
 - C. Spleen, thymus, and tonsils
 - D. Immunity
 1. Nonspecific cell and chemical defense
 2. Phagocytes and inflammation
 3. Antigen-antibody response
 4. Cell-mediated immune response
 5. Immunological memory
 6. Imbalances of immunity
- VI. Respiratory system
 - A. Functional anatomy
 - B. Mechanics of breathing
 - C. Gas exchanges
 - D. Transport of gases by blood
 - E. Control of respiration
- VII. Digestive system
 - A. Functional anatomy
 - B. Digestive physiology
 1. Chemical digestion
 2. Absorption
 3. Nutrition
 4. Metabolism and the role of the liver
 5. Energy balance
- VIII. Urinary system
 - A. Kidney anatomy
 - B. Kidney physiology
 1. Filtration
 2. Reabsorption
 3. Secretion
 - C. Urine
 1. Regulation
 2. Composition
 3. Voiding
 - D. Fluid and electrolyte balance
 - E. Acid-base balance
- IX. Reproductive system
 - A. Anatomy of male reproductive system
 - B. Physiology of male system
 - C. Anatomy of female reproductive system
 - D. Physiology of female system
 1. Hormonal regulation of ovarian cycles
 2. Hormonal regulation of uterine cycles

E. Pregnancy and embryonic development

COURSE GOALS/OBJECTIVES/OUTCOMES:

Students will

1. describe the structural organization and major functions of the human body's organ systems.
2. define negative feedback and describe its role in maintaining body homeostasis.
3. compare the general structures and biological functions of the major inorganic and organic molecules in the body.
4. differentiate between the transport processes through cell membranes and how they relate to the functions of each cell type.
5. explain the functional classification of tissues indicating their chief roles and locations.
6. describe the composition, physical characteristics, and the processes involved in hemostasis of the blood.
7. describe the functional anatomy of the heart as it relates to heart sounds, EKG (electrocardiogram), and the nervous system control of cardiac output.
8. list and explain the factors that influence blood pressure and describe how blood pressure is regulated.
9. outline the relationship of lymph to the cardiovascular system, including the source and mechanisms of transport.
10. relate the components of nonspecific immunity to the events of the inflammatory process.
11. compare and contrast the general, specific, and related functions of the B and T lymphocytes.
12. describe the mechanics of breathing, gas exchanges in the body, and the transport of gases by blood.
13. summarize and explain the influences of reflexes, pH, and partial pressures on respiratory rate and depth.
14. identify and describe the overall function of the digestive system from chemical breakdown to absorption of foodstuffs.
15. distinguish between the various pathways and processes involved in the post-absorptive digestion and metabolism of biomolecules.
16. describe the nephron of the kidney and the mechanisms of urine formation.
17. explain the kidney's role in the balance of fluids, electrolytes, and pH.
18. describe hormonal regulation of testicular function and the physiological effects on male reproduction.
19. describe the regulation of the ovarian and menstrual cycles of female reproductive physiology.
20. diagram the development of an embryo from fertilization to the fetal period, including the placenta.

MNTC GOALS AND COMPETENCIES MET:

Natural Sciences

HCC COMPETENCIES MET:

Working Productively and Cooperatively

Communicating Clearly and Effectively

Thinking Creatively and Critically

Practicing Cultural, Economic, and Environmental Sustainability

STUDENT CONTRIBUTIONS:

Students are expected to attend all lecture and laboratory sessions, participate in and contribute to class discussions, complete all assignments on time and request assistance when needed. Attendance is critical for the successful completion of this course.

**SPECIAL ASSESSMENT SHALL TAKE PLACE USING INSTRUMENTS
SELECTED/DEVELOPED BY THE COURSE INSTRUCTOR.**

**SPECIAL INFORMATION: (SPECIAL FEES, DIRECTIVES ON HAZARDOUS
MATERIALS, ETC.):**

Students are required to manipulate small sharp dissection instruments. Dissection is an integral component of this course. Exposure to chemical preservatives is minimal. Students may provide their own gloves (optional) which are available for purchase in the college bookstore. Students must observe all lab safety procedures.

AASC APPROVAL DATE: February 10, 2016
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REVIEW DATE: February 2021

BIOL 1250: so
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