JEFFERSON COLLEGE

COURSE SYLLABUS

BIO 120

HUMAN ANATOMY & PHYSIOLOGY

5 Credit Hours

Prepared by:
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Ms. Linda Abernathy, Division Chair, Math, Science & Business
Ms. Shirley Davenport, Dean, Arts & Science Education
BIO: 120 HUMAN ANATOMY & PHYSIOLOGY

I. CATALOG DESCRIPTION

A. Course pre-requisites/Co-requisites:
   Reading proficiency

B. 5 semester credit hours

C. Human Anatomy and Physiology is a study of basic structure and function of the human body and covers fundamental concepts of all organ systems. Human Anatomy and Physiology will satisfy the laboratory science requirement for the Associate of Arts degree. Students cannot apply both BIO120 and BIO211 toward graduation. Students expecting to transfer credit in Anatomy and Physiology to another program or institution should verify that this course is sufficient for their needs. If not, students should enroll in the Biology 211-212 sequence (On Demand)

II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

<table>
<thead>
<tr>
<th>Expected Learning Outcomes</th>
<th>Assessment Measures</th>
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<tbody>
<tr>
<td>Demonstrate appropriate use of vocabulary to describe human anatomy and physiology in written and verbal communication</td>
<td>Exams, quizzes, and laboratory exercises</td>
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<tr>
<td>Describe the levels of organization in the human body from molecules to cells to tissues to organs and understand their relationships to one another in body systems</td>
<td>Exams, quizzes, and laboratory exercises</td>
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<td>Locate and identify major structures of the following systems: integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, respiratory, digestive, urinary, and reproductive</td>
<td>Exams, quizzes, and laboratory exercises</td>
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<tr>
<td>Explain the physiology of each of the following systems and their contributions to homeostasis: integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, respiratory, digestive, urinary, and reproductive</td>
<td>Exams, quizzes, case studies, and laboratory exercises</td>
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<tr>
<td>Demonstrate wise decisions about health and human activity through understanding of how body systems work together to maintain homeostasis</td>
<td>Exams, quizzes, and case studies</td>
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III. OUTLINE OF TOPICS

A. Organization of the human body
   1. Recognize and describe anatomical position
   2. Use descriptive terms to describe planes, directions, cavities, and points of reference associated with specific regions of the body
   3. Explain mechanisms of negative feedback and positive feedback and provide physiological examples of each

B. Molecules
   1. Explain why water is so important to life
   2. Relate the pH scale to hydrogen ion concentration and understand the importance of pH homeostasis; explain the action and importance of a buffer
   3. Discuss the structure and function of carbohydrates, lipids, proteins, and nucleic acids in biological organisms
   4. Discuss the elements of a healthy diet and be able to interpret a nutrition panel on foods
   5. Explain the importance of enzymes to living organisms

C. Cell biology
   1. Discuss the role of cellular structures including the plasma membrane, cytoskeleton, mitochondria, chloroplasts, ribosomes, and nucleus
   2. Explain the structure and function of the plasma membrane
   3. Outline the processes that are used to move materials across a membrane
   4. Follow the synthesis of a protein intended for secretion from the cell

D. Tissues

   Recognize the four basic tissue types in the human body and describe the general functions of each.

E. Integumentary system
   1. List and explain the components and functions of the integumentary system
   2. Explain two ways in which structures in the skin can help regulate body temperature
   3. Describe the steps in repair of injuries to the skin
   4. Explain how third-degree burns interfere with homeostasis and how they are treated

F. Skeletal system
   1. List and explain the functions of the skeletal system
2. Recognize basic anatomical and histological terminology
3. Identify the major elements of the axial skeleton and the appendicular skeleton
4. Explain the processes of bone growth and repair
5. Discuss the types of joints and the movements at synovial joints

G. Muscular system
1. List and explain the functions of the muscular system
2. Recognize basic anatomical and histological terminology
3. Identify major muscles and list their actions, origins, and insertions
4. Explain the mechanism of muscle contraction (sliding filament theory)
5. Describe the events that occur at the neuromuscular junction
6. Define a motor unit and explain how it is important in contractions of various strengths

H. Nervous system
1. Explain the origin of the resting potential, action potential, and synaptic potential
2. Describe the structure and function of a neuron
3. Describe the roles of glial cells, meninges, and cerebrospinal fluid
4. Explain efferent and afferent pathways and the reflex arc
5. List the components and describe the primary functions of the spinal cord and brain
6. Describe the structure and primary functions of the divisions of the autonomic nervous system

I. Endocrine system
1. Compare and contrast the mechanisms of regulation seen in the nervous system and the endocrine system
2. Contrast the mechanisms of action of non-steroid hormones and steroid hormones
3. Give examples of how these mechanisms of regulation operate: releasing hormones, negative feedback, antagonistic hormones
4. Locate the primary endocrine organs and explain the role of their secretions

J. Cardiovascular system
1. Identify and describe the basic structure and function of the heart
2. Describe pulmonary and systemic circulation patterns; know blood flow through the heart
3. Describe the structure of arteries, capillaries, and veins; describe blood pressure in each
4. Explain the role of the lymphatic system in circulation of body fluids.
5. Explain the roles of formed elements in the blood
6. Explain how gasses are carried in the blood and the role of the bicarbonate buffer system (and the equation)
K. Respiratory system
1. Describe the anatomy and histology of the pulmonary organs
2. Explain respiratory volumes and capacities
3. Explain how respiration is regulated
4. Explain the relationship between breathing and cellular respiration (and write the equation)

L. Digestive system
1. Identify the digestive and accessory organs and describe their functions
2. Describe and locate the primary functions of mechanical and enzymatic digestion, absorption, and elimination
3. Explain the local regulation of the digestive system
4. Describe the primary functions of the liver and the operation of the hepatic portal system

M. Urinary system
1. List and explain the functions of the urinary system.
2. Describe the structure of the kidney and the location of the parts of the nephron
3. Explain the three steps in urine formation and identify where each occurs
4. Explain how hormones can regulate the composition of body fluids
5. Explain how the urinary and respiratory systems work together to regulate pH

N. The reproductive system
1. List the hormones involved in both male and female reproduction, know where these hormones are produced, and their targets
2. Contrast the functions of the male reproductive system and the female reproductive system and explain how the systems are adapted to fulfill these functions
3. Explain why female fertility is highest two days before ovulation until one day after ovulation
4. Describe where fertilization occurs in the female reproductive system; trace the path and timing of the fertilized egg develop before it implants in the uterus
5. If fertilization does not occur, describe the levels of hormones (FSH, LH, estrogen, and progesterone) and the activities within the ovary and uterus from days 1-28 of the menstrual cycle

IV. METHOD(S) OF INSTRUCTION:

A. Lecture and PowerPoint presentations to support text reading assignments

B. Case studies
C. Online resources (videos, self-quizzing, etc.)

D. Laboratory exercises

V. REQUIRED TEXTBOOK(S):


(Textbook packaged with *Anatomy and Physiology Revealed* and access to Connect web resource)


VI. REQUIRED MATERIALS:

A. Textbook with Connect web support

B. Laboratory manual

C. Online access to STARS and Blackboard

VII. SUPPLEMENTAL REFERENCES

A. Library resources: present offerings and anticipated texts, journals, video/audio tapes, software, etc.

B. Internet references

VIII. METHOD OF EVALUATION

A. Lecture exams and comprehensive final exam 55%

B. Class activities, case studies, and quizzes 15%

C. Laboratory 30%

D. Grading Scale:
   90-100% = A
   80-89% = B
   70-79% = C
   60-69% = D
   Below 60% = F
IX. ADA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Library; phone 636-481-3169).

X. ACADEMIC HONESTY STATEMENT

Students who are caught cheating or plagiarizing material in this course will not receive credit for the assignment in question and may be dropped from the course with a failing grade. A detailed description of the Academic Honesty Policy statement can be found in the Jefferson College Student Handbook or online at: http://www.jeffco.edu/jeffco/index.php?option=com_weblinks&catid=26&Itemid=84

XI. ATTENDANCE STATEMENT

Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.