BIOL181

Course Summary

Course : BIOL181 **Title :** Introduction to Human Anatomy and Physiology
Length of Course : 8
Prerequisites : N/A **Credit Hours :** 3

Description

Course Description: This course introduces students to the fundamental principles of biology emphasizing the structure and function of the human body. The course will begin with a general introduction to biology and the scientific method. It continues with an overview of organic chemistry, a study of cellular and tissue structure and function, the organization and regulation of body systems, and then move on to survey each of the following organ systems of the human body: cardiovascular, lymphatic, and immune, digestive, respiratory, urinary, skeletal, muscular, nervous, endocrine, and reproductive. The course closes with introductions to genetics, and human evolution and ecology. Students will discuss the process of the scientific method and also demonstrate science information literacy skills through source selection and creation of a narrated presentation.

Course Scope:

Objectives

After successfully completing this course, you will be able to:

CO-1 Explain the characteristics common to all living things, describe the levels of organization of life, explain the theory of evolution, and describe the scientific method.

CO-2 State the basic principles of cell theory and describe the structures cell are composed of. Differentiate the methods of transport across the plasma membrane and identify the various types of tissues. Explain the concept and mechanisms involved in homeostasis.

CO-3 List the functions of blood and describe the structure and function of the heart and blood vessels.

CO-4 Describe the basic structures and functions of the respiratory, digestive, and urinary systems.

CO-5 Identify the structure and location of bones, list examples of the various types of joints, describe the process of muscular contraction, and identify the muscles affected by specific movements. List the structures and basic functions of the nervous system and describe how a nerve impulse is generated and conducted.

CO-6 Describe the function and organization of the endocrine and lymphatic systems, and define metabolism and describe its importance in homeostasis. Explain the functions of the male and female reproductive organs.

CO-7 Describe patterns of human genetic diversity and explain the role of DNA and issues in DNA technology.

CO-8 Describe how organisms interact with their environments and explain the relationship of humans with ecosystems.

Outline

Week 1: Exploring Life & Science and Basic Chemistry

Learning Outcomes

CO-1

Required Readings

The BIOL181 Course Syllabus

The BIOL181 Course Project Guide

Week 1 Lesson

Week 1 Scientific Method Lesson

Concepts of Biology *- 1 Unit 1: The Cellular Foundation of Life*

- Chapter 1. Introduction to Biology
  - Introduction
  - 1.1 Themes and Concepts of Biology
  - 1.2 The Process of Science

Anatomy and Physiology *- 1 Unit 1: Levels of Organization*

- Chapter 2. The Chemical Level of Organization
  - Introduction
  - 2.1 Elements and Atoms: The Building Blocks of Matter
  - 2.2 Chemical Bonds
  - 2.3 Chemical Reactions
  - 2.4 Inorganic Compounds Essential to Human Functioning
  - 2.5 Organic Compounds Essential to Human Functioning

Assignments

Week 1 Forum

Academic Honor Code Quiz

Week 1 Quiz

Recommended Optional Reading
Recommended Media

Week 2: Cells, Tissues, and the Regulation of Body Systems

Learning Outcomes

CO-2

Required Readings

Week 2 Lesson

Week 2 Scientific Method Lesson

Anatomy and Physiology *- 1 Unit 1: Levels of Organization*

- Chapter 1. An Introduction to the Human Body
  - Introduction
  - 1.1 Overview of Anatomy and Physiology
  - 1.2 Structural Organization of the Human Body
  - 1.3 Functions of Human Life
  - 1.4 Requirements for Human Life
  - 1.5 Homeostasis
  - 1.6 Anatomical Terminology
- Chapter 3. The Cellular Level of Organization
  - Introduction
  - 3.1 The Cell Membrane
  - 3.2 The Cytoplasm and Cellular Organelles
  - 3.3 The Nucleus and DNA Replication
  - 3.4 Protein Synthesis
  - 3.5 Cell Growth and Division
  - 3.6 Cellular Differentiation
- Chapter 4. The Tissue Level of Organization
  - Introduction
  - 4.1 Types of Tissues
  - 4.2 Epithelial Tissue
  - 4.3 Connective Tissue Supports and Protects
  - 4.4 Muscle Tissue and Motion
  - 4.5 Nervous Tissue Mediates Perception and Response
  - 4.6 Tissue Injury and Aging

Anatomy and Physiology - 2 Unit 2: Support and Movement

- Chapter 5. The Integumentary System
  - Introduction
  - 5.1 Layers of the Skin
  - 5.2 Accessory Structures of the Skin
  - 5.3 Functions of the Integumentary System
  - 5.4 Diseases, Disorders, and Injuries of the Integumentary System

Assignments

Week 2 Forum

Week 2 Quiz

Recommended Optional Reading
Recommended Media

Week 3: Cardiovascular, Lymphatic, and Immune Systems

Learning Outcomes

CO-3

Required Readings

Week 3 Lesson

Week 3 Scientific Method Lesson

Anatomy and Physiology *- 4 Unit 4: Fluids and Transport*

- Chapter 18. The Cardiovascular System: Blood
  - Introduction
  - 18.1 An Overview of Blood
  - 18.2 Production of the Formed Elements
  - 18.3 Erythrocytes
  - 18.4 Leukocytes and Platelets
  - 18.5 Hemostasis
  - 18.6 Blood Typing
- Chapter 19. The Cardiovascular System: The Heart
  - Introduction
  - 19.1 Heart Anatomy
  - 19.2 Cardiac Muscle and Electrical Activity
  - 19.3 Cardiac Cycle
  - 19.4 Cardiac Physiology
  - 19.5 Development of the Heart
- Chapter 20. The Cardiovascular System: Blood Vessels and Circulation
  - Introduction
  - 20.1 Structure and Function of Blood Vessels
  - 20.2 Blood Flow, Blood Pressure, and Resistance
  - 20.3 Capillary Exchange
  - 20.4 Homeostatic Regulation of the Vascular System
  - 20.5 Circulatory Pathways
  - 20.6 Development of Blood Vessels and Fetal Circulation
- Chapter 21. The Lymphatic and Immune System
  - Introduction
  - 21.1 Anatomy of the Lymphatic and Immune Systems
  - 21.2 Barrier Defenses and the Innate Immune Response
  - 21.3 The Adaptive Immune Response: T lymphocytes and Their Functional Types
  - 21.4 The Adaptive Immune Response: B-lymphocytes and Antibodies
  - 21.5 The Immune Response against Pathogens
  - 21.6 Diseases Associated with Depressed or Overactive Immune Responses
  - 21.7 Transplantation and Cancer Immunology

Assignments

Week 3 Forum

Week 3 Quiz

Assignment #1: Annotated Bibliography

Recommended Optional Reading
Recommended Media

Week 4: Digestive, Respiratory, and Urinary Systems

Learning Outcomes

CO-4

Required Readings

Week 4 Lesson

Week 4 Scientific Method Lesson

Anatomy and Physiology *- 5 Unit 5: Energy, Maintenance, and Environmental Exchange*

- Chapter 22. The Respiratory System
  - Introduction
  - 22.1 Organs and Structures of the Respiratory System
  - 22.2 The Lungs
  - 22.3 The Process of Breathing
  - 22.4 Gas Exchange
  - 22.5 Transport of Gases
- Chapter 23. The Digestive System
  - Introduction
  - 23.1 Overview of the Digestive System
  - 23.2 Digestive System Processes and Regulation
  - 23.3 The Mouth, Pharynx, and Esophagus
  - 23.4 The Stomach
  - 23.5 The Small and Large Intestines
  - 23.6 Accessory Organs in Digestion: The Liver, Pancreas, and Gallbladder
  - 23.7 Chemical Digestion and Absorption: A Closer Look
- Chapter 24. Metabolism and Nutrition
  - Introduction
  - 24.5 Metabolic States of the Body
  - 24.6 Energy and Heat Balance
  - 24.7 Nutrition and Diet
- Chapter 25. The Urinary System
  - Introduction
  - 25.1 Physical Characteristics of Urine
  - 25.2 Gross Anatomy of Urine Transport
  - 25.3 Gross Anatomy of the Kidney
  - 25.4 Microscopic Anatomy of the Kidney
  - 25.5 Physiology of Urine Formation
  - 25.6 Tubular Reabsorption
  - 25.7 Regulation of Renal Blood Flow
  - 25.8 Endocrine Regulation of Kidney Function
  - 25.9 Regulation of Fluid Volume and Composition
  - 25.10 The Urinary System and Homeostasis

Assignments

Week 4 Forum

Week 4 Quiz

Recommended Optional Reading
Recommended Media

Week 5: Skeletal, Muscular, & Nervous Systems and Senses

Learning Outcomes

CO-5

Required Readings

Week 5 Lesson

Week 5 Scientific Method Lesson

Anatomy and Physiology *- 2 Unit 2: Support and Movement*

- Chapter 6. Bone Tissue and the Skeletal System
  - Introduction
  - 6.1 The Functions of the Skeletal System
  - 6.2 Bone Classification
  - 6.3 Bone Structure
  - 6.4 Bone Formation and Development
  - 6.5 Fractures: Bone Repair
  - 6.6 Exercise, Nutrition, Hormones, and Bone Tissue
  - 6.7 Calcium Homeostasis: Interactions of the Skeletal System and Other Organ Systems
- Chapter 7. Axial Skeleton
  - Introduction
  - 7.1 Divisions of the Skeletal System
  - 7.2 The Skull *Focus on main points
  - 7.3 The Vertebral Column *Focus on main points
  - 7.4 The Thoracic Cage *Focus on main points
- Chapter 8. The Appendicular Skeleton
  - Introduction
  - 8.1 The Pectoral Girdle *Focus on main points
  - 8.2 Bones of the Upper Limb *Focus on main points
  - 8.3 The Pelvic Girdle and Pelvis *Focus on main points
  - 8.4 Bones of the Lower Limb *Focus on main points

Biology *- 7 Unit 7. Animal Structure and Function*

- Chapter 38. The Musculoskeletal System
  - 38.3 Joints and Skeletal Movement

Anatomy and Physiology *- 2 Unit 2: Support and Movement*

- Chapter 10. Muscle Tissue
  - Introduction
  - 10.1 Overview of Muscle Tissues
  - 10.2 Skeletal Muscle
  - 10.3 Muscle Fiber Contraction and Relaxation
  - 10.4 Nervous System Control of Muscle Tension
  - 10.5 Types of Muscle Fibers
- Chapter 11. The Muscular System
  - Introduction
  - 11.1 Interactions of Skeletal Muscles, Their Fascicle Arrangement, and Their Lever Systems
  - 11.2 Naming Skeletal Muscles

Anatomy and Physiology *- 3 Unit 3: Regulation, Integration, and Control*

- Chapter 12. The Nervous System and Nervous Tissue
  - Introduction
  - 12.1 Basic Structure and Function of the Nervous System

    - 12.2 Nervous Tissue
    - 12.3 The Function of Nervous Tissue
    - 12.4 The Action Potential
    - 12.5 Communication Between Neurons
- Chapter 14. The Somatic Nervous System
    - Introduction
    - 14.1 Sensory Perception
- Chapter 15. The Autonomic Nervous System
    - 15.4 Drugs that Affect the Autonomic System

Assignments

Week 5 Forum

Week 5 Quiz

Assignment #2: The Outline

Recommended Optional Reading
Recommended Media

Week 6: Endocrine & Reproductive Systems and Development and Aging

---

Learning Outcomes

CO-6

Required Readings

Week 6 Lesson

Week 6 Scientific Method Lesson

Anatomy and Physiology *- 3 Unit 3: Regulation, Integration, and Control*

- Chapter 17. The Endocrine System
    - Introduction
    - 17.1 An Overview of the Endocrine System
    - 17.2 Hormones
    - 17.3 The Pituitary Gland and Hypothalamus
    - 17.4 The Thyroid Gland
    - 17.5 The Parathyroid Glands
    - 17.6 The Adrenal Glands
    - 17.7 The Pineal Gland
    - 17.8 Gonadal and Placental Hormones
    - 17.9 The Endocrine Pancreas
    - 17.10 Organs with Secondary Endocrine Functions

Anatomy and Physiology *- 6 Unit 6: Human Development and the Continuity of Life*

- Chapter 27. The Reproductive System
    - Introduction
    - 27.1 Anatomy and Physiology of the Male Reproductive System
    - 27.2 Anatomy and Physiology of the Female Reproductive System
    - 27.3 Development of the Male and Female Reproductive Systems
- Chapter 28. Development and Inheritance
    - Introduction
    - 28.1 Fertilization

- 28.2 Embryonic Development
- 28.3 Fetal Development
- 28.4 Maternal Changes During Pregnancy, Labor, and Birth
- 28.5 Adjustments of the Infant at Birth and Postnatal Stages
- 28.6 Lactation

Assignments

Week 6 Forum

Week 6 Quiz

Recommended Optional Reading
Recommended Media

Week 7: Human Genetics

Learning Outcomes

CO-7

Required Readings

Week 7 Lesson

Week 7 Scientific Method Lesson

Anatomy and Physiology *- 6 Unit 6: Human Development and the Continuity of Life*

- Chapter 28. Development and Inheritance
  - 28.7 Patterns of Inheritance

Concepts of Biology *- 3 Unit 3. Molecular Biology and Biotechnology*

- Chapter 9. Molecular Biology
  - Introduction
  - 9.1 The Structure of DNA
  - 9.2 DNA Replication
  - 9.3 Transcription
  - 9.4 Translation
  - 9.5 How Genes Are Regulated

Biology *- 3 Unit 3. Genetics*

- Chapter 13. Modern Understandings of Inheritance
  - 13.2 Chromosomal Basis of Inherited Disorders

Concepts of Biology *- 3 Unit 3. Molecular Biology and Biotechnology*

- Chapter 10. Biotechnology
  - Introduction
  - 10.1 Cloning and Genetic Engineering
  - 10.2 Biotechnology in Medicine and Agriculture
  - 10.3 Genomics and Proteomics

Assignments

Week 7 Forum

Week 7 Quiz

Assignment #3: The Presentation

Recommended Optional Reading
Recommended Media

Week 8: Human Evolution and Ecology

Learning Outcomes

CO-8

Required Readings

Week 8 Lesson

Week 8 Scientific Method Lesson

Biology *- 5 Unit 5. Biological Diversity*

- Chapter 29. Vertebrates
    - 29.7 The Evolution of Primates

Concepts of Biology *- 4 Unit 4. Evolution and the Diversity of Life*

- Chapter 11. Evolution and Its Processes
    - Introduction
    - 11.1 Discovering How Populations Change
    - 11.2 Mechanisms of Evolution
    - 11.3 Evidence of Evolution

Concepts of Biology *- Unit 6. Ecology*

- Chapter 19. Population and Community Ecology
    - Introduction
    - 19.1 Population Demographics and Dynamics
    - 19.2 Population Growth and Regulation
    - 19.3 The Human Population
    - 19.4 Community Ecology
- Chapter 20. Ecosystems and the Biosphere
    - Introduction
    - 20.1 Energy Flow through Ecosystems
    - 20.2 Biogeochemical Cycles
    - 20.3 Terrestrial Biomes

- 20.4 Aquatic and Marine Biomes

- Chapter 21. Conservation and Biodiversity
  - Introduction
  - 21.1 Importance of Biodiversity
  - 21.2 Threats to Biodiversity
  - 21.3 Preserving Biodiversity

Assignments

Week 8 Forum

Week 8 Quiz

Recommended Optional Reading
Recommended Media

Evaluation

Grading:

Name	Grade %
Forums	16.00 %
Week 1 Forum	2.00 %
Week 2 Forum	2.00 %
Week 3 Forum	2.00 %
Week 4 Forum	2.00 %
Week 5 Forum	2.00 %
Week 6 Forum	2.00 %
Week 7 Forum	2.00 %
Week 8 Forum	2.00 %
Quizzes	56.00 %
Week 1 Quiz	8.00 %
Week 2 Quiz	8.00 %
Week 3 Quiz	8.00 %
Week 4 Quiz	8.00 %
Week 5 Quiz	8.00 %
Week 6 Quiz	8.00 %
Week 7 Quiz	8.00 %
Week 8 Quiz	8.00 %
Course Project: Prep	14.00 %
Assignment #1: Annotated Bibliography	7.00 %
Assignment #2: The Outline	7.00 %
Course Project	14.00 %
Assignment #3: The Presentation	14.00 %

Materials

Book Title: Concepts of Biology - e-book available online, link provided inside the classroom in the Lessons section

Author: OpenStax College

Publication Info:

ISBN: 9781938168116

Book Title: Biology- e-book available online, link provided inside the classroom in the Lessons section

Author: OpenStax College

Publication Info: OpenStax College

ISBN: 9781938168093

Book Title: Anatomy & Physiology - e-book available online, link provided inside the classroom in the Lessons section

Author: OpenStax College

Publication Info:

ISBN: 9781938168130

Course Guidelines

Citation and Reference Style

- Attention Please: Students will follow the APA Format as the sole citation and reference style used in written work submitted as part of coursework to the University. Assignments completed in a narrative essay or composition format must follow the citation style cited in the APA Format.

Tutoring

- Tutor.com offers online homework help and learning resources by connecting students to certified tutors for one-on-one help. AMU and APU students are eligible for 10 free hours* of tutoring provided by APUS. Tutors are available 24/7 unless otherwise noted. Tutor.com also has a SkillCenter Resource Library offering educational resources, worksheets, videos, websites and career help. Accessing these resources does not count against tutoring hours and is also available 24/7. Please visit the APUS Library and search for 'Tutor' to create an account.

Late Assignments

- Students are expected to submit classroom assignments by the posted due date and to complete the course according to the published class schedule. The due date for each assignment is listed under each Assignment.
- Generally speaking, late work may result in a deduction up to 15% of the grade for each day late, not to exceed 5 days.
- As a working adult I know your time is limited and often out of your control. Faculty may be more flexible if they know ahead of time of any potential late assignments.

Turn It In

- Faculty may require assignments be submitted to Turnitin.com. Turnitin.com will analyze a paper and

report instances of potential plagiarism for the student to edit before submitting it for a grade. In some cases professors may require students to use Turnitin.com. This is automatically processed through the Assignments area of the course.

Academic Dishonesty

- Academic Dishonesty incorporates more than plagiarism, which is using the work of others without citation. Academic dishonesty includes any use of content purchased or retrieved from web services such as CourseHero.com. Additionally, allowing your work to be placed on such web services is academic dishonesty, as it is enabling the dishonesty of others. The copy and pasting of content from any web page, without citation as a direct quote, is academic dishonesty. When in doubt, do not copy/paste, and always cite.

Submission Guidelines

- Some assignments may have very specific requirements for formatting (such as font, margins, etc) and submission file type (such as .docx, .pdf, etc) See the assignment instructions for details. In general, standard file types such as those associated with Microsoft Office are preferred, unless otherwise specified.

Disclaimer Statement

- Course content may vary from the outline to meet the needs of this particular group.

Communicating on the Forum

- Forums are the heart of the interaction in this course. The more engaged and lively the exchanges, the more interesting and fun the course will be. Only substantive comments will receive credit. Although there is a final posting time after which the instructor will grade comments, it is not sufficient to wait until the last day to contribute your comments/questions on the forum. The purpose of the forums is to actively participate in an on-going discussion about the assigned content.
- “Substantive” means comments that contribute something new and hopefully important to the discussion. Thus a message that simply says “I agree” is not substantive. A substantive comment contributes a new idea or perspective, a good follow-up question to a point made, offers a response to a question, provides an example or illustration of a key point, points out an inconsistency in an argument, etc.
- As a class, if we run into conflicting view points, we must respect each individual's own opinion. Hateful and hurtful comments towards other individuals, students, groups, peoples, and/or societies will not be tolerated.

University Policies

Student Handbook

- Drop/Withdrawal policy
- Extension Requests
- Academic Probation
- Appeals
- Disability Accommodations

The mission of American Public University System is to provide high quality higher education with emphasis on educating the nation’s military and public service communities by offering respected, relevant, accessible, affordable, and student-focused online programs that prepare students for service and leadership in a diverse, global society.