



EXPLORING CREATION WITH

ADVANCED BIOLOGY

2nd EDITION

COURSE INTRODUCTION

Introduction and Use of This Product (00:37)

Safety Message (00:32)

MODULE 1: INTRODUCTION TO ANATOMY AND PHYSIOLOGY

Introduction (03:38)

Organizational Levels of the Human Body (09:18)

Homeostasis (05:41)

Control of Homeostasis: Feedback Systems (05:54)

A Review of Cell Structure and Organelle Function (08:03)

A Review of Protein Synthesis (02:59)

A Review of Cellular Mitosis (03:17)

The Plasma Membrane (05:45)

Functions of the Plasma Membrane (08:03)

Membrane Transport Processes (07:59)

MODULE 2: HISTOLOGY - THE STUDY OF TISSUES

Introduction (07:17)

Epithelial Tissue (07:49)

Stratified Epithelial Tissue (05:10)

Glandular Epithelium (21:19)

Experiment 2.1: Epithelial Tissues

Experiment 2.2: Microscopic Anatomy of the Salivary Glands

Connective Tissue (02:35)

Connective Tissue Proper (05:44)

Cartilage (03:02)

Bone and Blood (01:02)

Membranes (03:28)

Tissue Repair (06:51)

MODULE 3: THE INTEGUMENTARY AND SKELETAL SYSTEMS

A Closer Look at the Epidermis (08:22)

Experiment 3.1: A Closer Look at the Skin

Hair and Nails (14:30)

Experiment 3.2: A Closer Look at Follicles

Skin Glands (03:26)

The Skeletal System (03:12)

Gross Anatomy of Bone (04:35)

An Overview of the Skeletal System (02:08)

Details of the Appendicular Skeleton: The Limbs (02:12)

Details of the Appendicular Skeleton: The Hands and Feet (01:43)

Details of the Axial Skeleton: The Skull (05:25)

Details of the Axial Skeleton: The Vertebral Column (04:22)

Details of the Axial Skeleton: The Thoracic Cage (01:33)

MODULE 4: THE SKELETAL SYSTEM HISTOLOGY AND MOVEMENT

Introduction (07:17)

Experiment 4.1: Calcium Salts in Bone

Cancellous and Compact Bone Histology (07:33)

Experiment 4.2: Cancellous and Compact Bone Histology

Bone Growth and Bone Remodeling (10:19)

Bone Homeostasis (06:28)

Nutrition for Bone Health (00:57)

The Three Major Types of Joints in the Skeleton (08:55)

Motion and Terms of Movement (04:46)

MODULE 5: THE MUSCULAR SYSTEM HISTOLOGY & PHYSIOLOGY

Introduction (05:50)

Skeletal Muscle Structure (07:43)

Experiment 5.1: Skeletal Muscle Histology

How a Muscle Fiber Contracts (09:47)

The Neuromuscular Junction in a Skeletal Muscle (07:33)

How a Muscle Fiber Relaxes (03:28)

Motor Units (02:13)

Multiple Motor Unit Summation (06:07)

Muscle Tone (01:19)

Energy in Skeletal Muscle Fibers (07:06)

Warm-Up and Cool-Down (01:48)

MODULE 6: THE SKELETAL MUSCLE SYSTEM

Introduction (07:17)

An Overview of the Skeletal Muscle System (04:02)

Major Muscles of the Head and Face (03:53)

Major Muscles of the Anterior Chest and Abdominal Wall (02:53)

The Major Muscles of the Shoulder, Back, and Arm (02:18)

Major Muscles of the Forearm (03:49)

Muscles of the Hand (01:16)

Major Muscles of the Thigh (02:48)
Major Muscles of the Leg and Foot (02:19)
Summing Up (00:55)

MODULE 7: THE NERVOUS SYSTEM

Introduction (06:35)
The Nervous System at the Cellular Level (05:11)
Neuroglia (05:45)
Experiment 7.1: Neurons and Neuroglia
Nerve Structure (04:26)
Action Potentials I: The Resting Potential (06:19)
Action Potentials II: Stimulus and Response (07:59)
Action Potentials III: Stimulus and Conduction (09:17)
Synaptic Transmission (11:50)
Neuron Arrangements (04:40)

MODULE 8: THE CENTRAL NERVOUS SYSTEM

Introduction (00:55)
The Brain (04:13)
Brain Anatomy (09:55)
The Cerebrum in More Detail (13:25)
Other Important Structures in the Brain (04:45)
Protection of the Brain (04:31)
The Spinal Cord (05:17)
The Reflex Arc (04:32)
Ascending and Descending Pathways in the Spinal Cord (06:29)

MODULE 9: THE PERIPHERAL NERVOUS SYSTEM

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Divisions of the Autonomic Nervous System (12:09)
Control of the Autonomic Nervous System (03:44)
The Afferent Division of the Peripheral Nervous System (12:39)
The General Senses (07:44)
Experiment 9.1: Two-Point Discrimination
The Sense of Smell (04:18)
The Sense of Taste (04:14)
The Sense of Balance (08:49)
The Sense of Hearing (06:43)
The Sense of Vision: Eye Anatomy (27:59)
Experiment 9.2: Cow's Eye Dissection
The Sense of Vision: Physiology of the Eye (12:18)

MODULE 10: THE ENDOCRINE SYSTEM

Introduction (05:09)
The Endocrine System as a Whole (03:15)
Endocrine Glands and Hormones (15:10)
Hormone Chemistry (02:27)
Hormone Secretion Control (09:23)
Patterns of Hormone Secretion (02:34)
Hormone Receptors in the Body (05:46)
Prostaglandins (02:20)

MODULE 11: THE CARDIOVASCULAR SYSTEM

Introduction (04:06)
The Composition of Blood (05:06)
The Formed Elements in Blood (17:08)
Experiment 11.1: Examining a Blood Smear
Blood as a Connective Tissue (14:10)
Blood Types (10:03)
An Overview of Blood Circulation (04:59)
Heart Anatomy (19:14)
Experiment 11.2: Cow's Heart Dissection
The Flow of Blood Through the Heart (02:50)
Cardiac Muscle and the Cardiac Cycle (06:08)
Blood Vessels and the Entire Circulatory System (06:13)

MODULE 12: THE LYMPHATIC SYSTEM

Introduction (02:04)
Lymph and Lymph Vessels (02:54)
Functions of the Lymphatic System (04:20)
Mucosa - Associated Lymphoid Tissue (MALT) (08:04)
Experiment 12.1: Histology of a Tonsil
Lymph Nodes (02:46)
The Spleen and the Thymus Gland (05:30)
Immunity (05:06)
The First Line of Innate (Nonspecific) Immunity (04:25)
The Second Line of Innate Defense (07:26)
Acquired Immunity, Part 1: Humoral Immunity (09:24)
Acquired Immunity, Part 2: Cell-Mediated Immunity (02:28)
Types of Acquired Immunity and Autoimmunity (05:30)

MODULE 13: THE DIGESTIVE SYSTEM

Introduction (02:54)
Overview of the Digestive System (06:34)
The Mouth, Pharynx, and Esophagus (09:09)

The Stomach (15:49)
Experiment 13.1: Histology of the Stomach
The Small Intestine (10:19)
The Large Intestine (05:54)
Accessory Organs: The Liver, Pancreas, and Gallbladder (16:09)
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Micronutrients (06:08)

MODULE 14: THE RESPIRATORY SYSTEM

Introduction (00:44)
Anatomy and Functions of the Respiratory System (08:21)
Voice (06:31)
The Muscles and Mechanics of Ventilation (05:38)
Factors That Aid Ventilation (09:42)
External Respiration (12:32)
Experiment 14.1: Histology of the Lung
Gas Exchange During External and Internal Respiration (08:17)
Respiratory Control (07:49)
Cellular Respiration (01:40)
Stage 1 of Cellular Respiration: Glycolysis (03:53)
Stage 2 of Cellular Respiration: Oxidation of Pyruvate (02:16)
Stage 3 of Cellular Respiration: Citric Acid (Krebs) Cycle (03:19)
Stage 4 of Cellular Respiration: Electron Transport Chain (06:50)
Review of Cellular Respiration (05:05)

MODULE 15: THE URINARY SYSTEM

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Anatomy of the Urinary System (07:33)
Urine Formation: The Overall Scheme (05:41)
Urine Formation, Step 1: Glomerular Filtration (08:00)
Urine Formation, Step 2: Reabsorption (06:54)
Urine Formation, Step 3: Secretion (01:35)
Urine Formation, Step 4: Reabsorption of Water (08:53)
Storage and Release of Urine (02:00)
Blood Pressure Control by the Kidneys (03:27)
Acid-Base Balance in the Body (24:54)
Experiment 15.1: The Bicarbonate Buffer

MODULE 16: THE REPRODUCTIVE SYSTEMS

Introduction (01:52)
Anatomy of the Male Reproductive System (08:42)
Meiosis (03:28)

Spermatogenesis: Development of Sperm (11:06)

Experiment 16.1: Spermatogenesis and Sperm

Hormonal Control of Male Reproduction (04:11)

Anatomy of the Female Reproductive System (03:30)

Oogenesis: Development of the Ovum (06:26)

The Menstrual Cycle (07:46)

Fertilization, Development, and Parturition (22:23)

Final Project: Fetal Pig Dissection