

# Phoenix Christian Sr High School SCI400H Honors Human Anatomy and Physiology Course Scope & Sequence

## COURSE DESCRIPTION

SCI 400H provides fundamentals to the study of the Anatomy (structure) and the Physiology (function) of the human body. Human Anatomy and Physiology includes the study of the Chemical levels of organization, the Cellular level of organization, the Tissue level of organization, the Organ level of organization and the Organ system level of organization. An integral part of the course is to teach the basic laboratory skills and techniques used in the Scientific method. Biblical truths are integrated into the lesson plans and time is also given for prayer. This course is considered an “honors” course.

## REQUIRED TEXTS AND \*KEY SUPPLEMENTAL MATERIALS

*Fundamentals of Anatomy & Physiology*

5th ed. Frederic H. Martin, Ph. D. Prentice Hall,

*Applications Manual* - Kathleen Welch, M.D. Prentice Hall

*Study Guide* - Charles Seiger. Prentice Hall, New Jersey.

*Laboratory Manual for Fundamentals of Anatomy and Physiology*

5th ed. Roberta M. Meehan.

## COURSE SCOPE AND SEQUENCE

### First Semester (First Nine Weeks)

Introduction To Anatomy And Physiology 3.0 Weeks

*Key Concepts:* Basic Functions of Living Organisms, Define Anatomy, Physiology, Major Levels of Organization, Homeostasis, and introduction to the terminology used as a Frame of Reference for Anatomical Studies. The steps of the Scientific Method, Laboratory Procedures and Safety will also be introduced.

*Assessments:* Assignments, Quizzes, Review Sheets, Labs, and Chapter Tests.

*Biblical Integration:* Genesis 2:7 - Man is the Ultimate of God’s Creation; Matthew 18 - Heart Of A Child; Psalm 139:13-14 - Appreciation to God; Matthew 6:25, 32-33 - Seek God First; Glorify Him With Your Body

Chemical Level Of Organization 2.5 Weeks

*Key Concepts:* Atoms and Molecules, Chemical Reactions, Inorganic Compounds, Organic Compounds, Chemicals and Cells.

*Assessments:* Assignments, Quizzes, Review Sheets, Labs, and Chapter Tests.

*Biblical Integration:* The Human Body has Physical Needs Which God Recognizes and Supplies, Ps. 33:18-19; Ps. 103:2-5, 13-14.

Cellular Level Of Organization 2.5 Weeks

*Key Concepts:* Studying Cells, Cell Membrane, Cytoplasm, Nucleus, Cell Life Cycle, Cell Diversity, and Differentiation.

*Assessments:* Assignments, Quizzes, Review Sheets, Labs, Chapter Tests.

*Biblical Integration:* The Immense Value Jesus Placed on Children.

- They are a Gift of God, Psalms 127 And 128.
- They are a Blessing, Proverbs 10:1; 15:20; 17:6; 23:24; 27:11; 29:3.

- Their Value to Him Comes with a Warning for Proper Treatment, Matthew 19:13-14; Mark 10:13-14; Luke 18:15-16.
- Life Begins at the Moment of Conception, Genesis 25:21-23; Psalm 139:13-16; Jeremiah 1:4-5.

The Principle of Resting on the Seventh Day to Allow the Body to Recuperate, Exodus 20:8-11

Tissue Level Of Organization 2 Weeks

*Key Concepts:* Epithelial Tissue, Connective Tissues, Membranes, Connective Tissue Framework of the Body, Muscle Tissue, Neural Tissue, Tissue Injuries and Aging.

*Assessments:* Assignments, Quizzes, Review Sheets, Labs, Chapter Tests.

*Biblical Integration:* The Face of the Lord is Against Those Who Do Evil, Psalm. 34:16.

The Function and Purpose Of Crying: The Shedding Of Tears.

- Tears Are Shed Due to Grief, Strain, Laughter, Irritants, but In Psalm 126:5-6, We Have the Principle of Weeping Over The Lost.
- Sowing The Seed With Heart-Felt Concern for the Lost.

**First Semester (Second Nine Weeks)**

Integumentary System 2 Weeks

*Key Concepts:* Epidermis, Dermis, Subcutaneous Layer, Accessory Structures, Local Control of Integumentary Function, Aging and Integumentary System, Integration with Other Systems.

*Assessments:* Assignments, Quizzes, Review Sheets, Labs, Chapter Tests.

*Biblical Integration:* -The Principle of Skin Markings or Tattoos: O.T. Law Prohibited Such Things, Leviticus 19:28.

The Mouth of an Educated Person is Like a Precious Stone. We Need to Learn from Those Who Have Knowledge and Wisdom so We Can Grow Intellectually, Proverbs 20:15. We are not to Stay as Spiritual Babies, but are to Grow and Mature.

Skeletal System 4 Weeks

*Key Concepts:* Classification of Bones, Bone Histology, Bone Development and Growth, Dynamic Nature of Bone, Skull, Vertebral Column, Thoracic Cage, Pectoral Girdle and Upper Limbs, Pelvic Girdle and Lower Limbs, Classification of Joints, Articular Form and Function, Representative Articulations, Aging and Articulations.

*Assessments:* Assignments, Quizzes, Review Sheets, Labs, Chapter Tests.

*Biblical Integration:* Job's Physical Condition Progressed to the Extent He Felt Like His Bones Had Been Pierced--His Skin Condition Had Worsened to Such a Degree that He Felt it Had Eaten into His Inner Self: 30:30.

Job Concluded (31:6) that His Physical Disease Was a Result of Sin, Which God Was Punishing. This Was a Wrong Conclusion.

Principle: Suffering is Sometimes Due to Sin. Suffering is Sometimes Due to Disobedience. Suffering Is Sometimes Due to Wrong Decisions We Make in Life.

Suffering is Sometimes Due to Testing Permitted By God.

-The Word Of God Is Powerful, Sharp, and Discerning. It Reveals Thoughts, Intents. Motives, Sins of Commission and Sins of Omission. It is Difficult to Separate Bones

and Ligaments at a Joint. The Word of God Has the Ability to Separate the Precise Accuracy, Hebrews 4:12.

-Christ is the Head of the Church. We are the Body. Each Member of that Body is Depicted as Bones Forming Joints: Correctly Fitted Together for Proper Functioning Ability, Ephesians 4:12-16.

### Muscular

3 Weeks

*Key Concepts:* Skeletal Muscle Tissue and the Muscular System, Anatomy of Skeletal Muscle, Contraction of Skeletal Muscle, Muscle Mechanics, Aging and Muscular System, Cardiac Muscle Tissue, Smooth Muscle Tissue, Biomechanics and Muscle Anatomy, Axial Muscles, Appendicular Muscles.

*Assessments:* Assignments, Quizzes, Review Sheets, Labs, Chapter Tests.

*Biblical Integration:* Man Takes Pleasure in the Outward Physical Appearance but God Does Not, Psalm 147:10-11

## **Second Semester (Third Nine Weeks)**

### Nervous System

3 Weeks

*Key Concepts:* Neurons, Neuroglia, Neurophysiology, Synaptic Activity, Gross Anatomy of Spinal Cord, Spinal Nerves, Introduction to Reflexes, Spinal Reflexes, Introduction to Organization of the Brain, Protection and Support of the Brain, Cerebrum, Limbic System, Diencephalon, Mesencephalon, Cerebellum, Pons, Medulla Oblongata.

*Assessments:* Assignments, Quizzes, Review Sheets, Labs, Chapter Tests.

*Biblical Integration:* God Sees Even the Most Insignificant (The Sparrow That Falls)- How Much More Does He Care For His Special Creation, Man.

- Let The Peace Of God Rule In Our Hearts.
- Be Patient, 1 Thessalonians 5:14
- We Can Have Inner Peace--Tranquility of Mind and Spirit, 2 Thessalonians 3:16
- We Are to Be Content with What We Have, 1 Timothy 6:6
- Avoid Strife (Stressful Situations) That Cannot Be Resolved Merely Lead To Conflict. 2 Timothy 2:23; Titus 3:9
- -Man's Life Does Not End With Death, Job 19:25-27, 1 Corinthians 15:20-23, 51-57; 1 Thessalonians 4:14-17

We Are to Have an Active, Calculating, Thinking Mind, 1 Timothy 4:13

The Spread of Disease Can Be Controlled By Certain Public Health Measures Like Confinement, Isolation, Quarantine, Leviticus 13:1-46.

### Cardiovascular System

4 Weeks

*Key Concepts:* Functions of Blood, Composition of Blood, Plasma, Formed Elements, Hemostasis, Anatomy of Heart, Heartbeat, Cardiodynamics, Anatomy of Blood Vessels, Cardiovascular Physiology, Cardiovascular Regulation, Patterns of Cardiovascular Response, Blood Vessels, Organization of Lymphatic System, Nonspecific Defenses, Specific Defenses: Immune Response, Development of Resistance, Immune Disorders, Stress and Immune Response, Aging and Immune Response.

*Assessments:* Assignments, Quizzes, Review Sheets, Labs, Chapter Tests.

*Biblical Integration:* Significance of the Blood of Jesus Christ. Atonement; OT Sacrificial System.

Lymphatic System and Immunity 2 weeks

*Key Concepts:* Identify the major components of the lymphatic system and their function, the importance of this system, list the body's specific and nonspecific defenses, and describe the components and mechanisms of each.

*Assessments:* Assignments, Quizzes, Review Sheets, Labs, Chapter Tests

*Biblical Integration:* Significance of how we are protected in ways that we sometimes do not know about or understand.

Respiratory System 2 Weeks

*Key Concepts:* Functions of Respiratory System, Organization of Respiratory System, Upper Respiratory System, Larynx, Trachea, Primary Bronchi, Lungs, Pleural Cavities and Pleural Membranes, Respiratory Physiology, Control of Respiration, Changes in Respiratory System, Aging and Respiratory System.

*Assessments:* Assignments, Quizzes, Review Sheets, Labs, Chapter Tests.

*Biblical Integration:* The Analogy of Prayer as the Air We Breathe, Essential for a Believer to Be a Strong Witness for Jesus Christ.

**Second Semester (Fourth Nine Weeks)**

Digestive System 3 Weeks

*Key Concepts:* Overview of Structure and Function of the Digestive Tract, Oral Cavity, Pharynx, Esophagus, Stomach, Small Intestine and Associated Glandular Organs, Large Intestine, Digestion and Absorption, Aging and the Digestive System.

*Assessments:* Assignments, Quizzes, Review Sheets, Labs, Chapter Tests.

*Biblical Integration:* The Body of the Believer is the Temple of The Holy Spirit Therefore We Must Maintain Good Health With Proper Eating Habits and a Balanced Diet.

Urinary System 2 Weeks

*Key Concepts:* Organization of Urinary System, Kidneys, Renal Physiology, Urine Transport, Storage, and Elimination, Aging and Urinary System.

*Assessments:* Assignments, Quizzes, Review Sheets, Labs, Chapter Tests.

*Biblical Integration:* We Must Filter Out That Which is Detrimental to Our Spiritual Growth.

Reproductive System / Development 4 Weeks

*Key Concepts:* Overview of Reproductive System, Reproductive System of the Male, Reproductive System of the Female, Physiology of Sexual Intercourse, Aging and Reproductive System, Overview of Topics in Development, Fertilization, Overview of Prenatal Development, First Trimester, Second And Third Trimesters, Labor and Delivery, Postnatal Development.

*Assessments:* Assignments, Quizzes, Review Sheets, Labs, Chapter Tests.

*Biblical Integration:* God's Principles Governing Sexuality of Man. God's Guidelines for Marriage; Rearing of Children, Ephesians 5-6.