

ANATOMY & PHYSIOLOGY

MISSION VALLEY REGIONAL OCCUPATION PROGRAM ANATOMY and PHYSIOLOGY COURSE OUTLINE

- 1. Course Title:** Anatomy and Physiology for Health Professions
- 2. CBEDS Title:** Anatomy & Physiology
- 3. CBEDS Number:** 2655

4. Career Pathways: **NHCSS Clusters** **O*NET Codes**

<i>Entry Level</i>		
Respiratory Therapist	Therapeutic	29-1126.00
Dental Assistant	Therapeutic	31-9099.99
Pharmacy Technician	Therapeutic	29-2052.00
Athletic Trainers	Therapeutic	29-9091.00
<i>Technical Level</i>		
Cardiovascular Technician	Diagnostic	29-2031.00
Audiologist	Therapeutic	29-1121.00
EKG/ECG Technician	Diagnostic	29-2031.00
Surgical Technologist	Therapeutic	29-2055.00
Dietetic Technician	Therapeutic	29-2051.00
Radiologic Technician	Diagnostic	29-2034.02
<i>Professional Level</i>		
Chiropractor	Therapeutic	29-1011.00
Nurse Practitioners	Therapeutic	29-1199.03
Pathologist	Therapeutic	29-1069.07
Psychiatrist	Therapeutic	29-1066.00
Physicians and Surgeons, All Other	Therapeutic	29-1069.00
Dental Hygienist	Therapeutic	29-2021.00
Pharmacist	Therapeutic	29-1051.00

4. Course Description:

This is a college preparatory course offered to juniors and seniors interested in health professions. This rigorous course allows students to: 1) Gain a strong foundation in anatomy and physiology that is needed for any health care profession and 2) complete their pre-requisite in U.C 'g' credit elective requirement if they wish to further their education in college in health sciences and medical technology. Classroom instruction includes study of body systems in detail in the health care point of view as well as basic medical terminology. The students obtain depth of concepts of anatomy and physiology that allows them to handle college level courses with reasonable comfort

5. Course Goals and student outcomes:

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The students taking this course will be able to:

- Demonstrate the mechanics of homeostasis through learning and applying the concepts of structure and the functions of body systems that maintain the homeostasis in a clinical setting.
- Demonstrate an understanding of energy, matter and organization through experimentation in lab, critical thinking, and problem solving and group projects.
- Demonstrate an understanding of human development and growth through various projects by applying the concepts learned.

6. Course Content Outline and Objectives:

The course is composed of three main concepts of Homeostasis, Energy and Growth and Development. These concepts are covered under the respective body systems. Lectures and lab activities are based on the objectives mentioned to achieve the ability of the students to demonstrate the skills gained. Each objective is linked to the state and national adopted standards.

7. Pre-requisites:

This high school class is offered to juniors and seniors that have completed Biology and chemistry as freshmen and sophomores with “C” or better grade. Medical Terminology I and Medical Terminology II is recommended

8. Hours:

The students enrolled in this **one - hour** course will receive **180 hours** of classroom instruction that gives **10 units** of credit.

9. Course Outline:

CAREER PREPARATION STANDARDS		Class	Standards
I.	WORKPLACE BASIC SKILLS & BEHAVIORS	Integrated throughout course	2.1
	<i>(MVROP ESLR #1)</i>		4.1
	<i>(NHS Oral Communication Skills-2.11, 2.12, 2.13, 2.14, 2.15; Key Employability Skills-4.17; Interpersonal Communications-4.21, 4.22, 4.23, 4.24; Personal Growth and Development-4.32, 4.33; Cultural, Social, & Ethnic Diversity-6.31, 6.32; Health Care Teams-8.11; Team Member Participation-8.21, 8.24, 8.26, 8.27, 8.29)</i>		4.2
			4.3
			6.3
			8.1
			8.2
		Class	Standards
A.	Apply skills learned in class.	5	
B.	Analyze information and make decisions.		
C.	Communicate verbally and in writing.		

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1. Observe tone of voice, facial expressions, and how words are spoken.
 2. Recognize & explain commonly used defense mechanisms.
 3. Identify religious beliefs, values, traditions, practices, and rituals.
 4. Consistently use courtesy, cooperation, emotional control, & empathy.
 5. Demonstrate active listening skills, sensitivity, concern, and tactfulness with family members and health team
- D. Work independently and as a team member in a diverse workplace.
- E. Work reliably, responsibly, and ethically. 5
1. Identify types of harassment and complaints
 2. Describe laws related to harassment
 3. Discuss confidentiality related to harassment

II. CAREER TECHNICAL SKILLS Integrated 7.2
(MVROP ESLR #2) throughout course 7.3
(NHS Communication Technology-11.11; Personal Safety-7.21, 7.22; 7.4
Environmental Safety-7.32, 7.33, 7.34; Common Safety Hazards-7.41, 7.42, 7.43, 9.1
7.44, 7.45, 7.46; Health Behaviors-9.13, 9.14; Occupational Safety-10.12) 10.0

- A. Use appropriate technology. 5 11.1
1. Identify major components of a computer system
 2. Compare computer capabilities and limitations
 3. Describe computer applications currently being used in today's health care computer systems
- B. Understand and practice occupational safety standards. 10
1. Use correct body mechanics while performing procedures in the laboratory or clinical area
 2. Observe all safety standards established by the Occupational Safety and Health Administration (OSHA), especially the Occupational Exposure to Hazardous Chemicals Standards & the Bloodborne Pathogen Standard
 3. Observe all regulations for patient safety while performing procedures in any area
 4. List the main classes of fire extinguishers
 5. Locate and describe the operation of the nearest fire alarm
 6. Describe the evacuation plan according to school policy
- C. Demonstrate an awareness of how a business or industry functions.

III. JOB EMPLOYMENT SKILLS Integrated 4.1
(MVROP ESLR #3) throughout course 4.4
(NHS Career Decision Making-4.41, 4.42; Key Employability Skills-4.12, 4.14,
4.17, 4.18, 4.19)

- | | Class | Standards |
|--|-------|-----------|
| A. Develop a plan to achieve career goals. | 10 | |
| 1. Create a Career Portfolio | | |
| 2. Choose a Medical Career | | |

- 3. Identify educational requirements and skills
- 4. Develop a career brochure
- B. Use effective job search strategies. 10
 - 1. Write a letter of application
 - 2. Prepare a resume' containing all necessary information
 - 3. Complete a job application form
 - 4. Practice job interviewing with proper dress
 - 5. Determine income and budgeting
- C. Demonstrate an awareness of the importance of lifelong learning.

PART 1	Introduction to Anatomy and Physiology
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I	Objectives	5
	A. What is Anatomy and Physiology?	
	B. Describe the Language <ul style="list-style-type: none"> 1. Define the parts of medical terminology 2. Describe the metric system 3. Define abbreviations 	
	C. Define the language of disease <ul style="list-style-type: none"> Differentiate between the symptoms and signs of a disease 	
	D. Describe the Anatomy and Physiology concepts you will encounter on your journey	
	E. Review the case study	
II.	THE HUMAN BODY: Objectives	10
	A. The Map of the Human Body <ul style="list-style-type: none"> 1. Describe Body Positions 2. Define Body Planes and Directional Terms, 3. Name and locate the Body Cavities 4. Describe Body Regions 	
III.	THE CELLS; THE RAW MATERIALS AND BUILDING BLOCKS	10
	A. Identify the chemical constituents of a cell	
	B. Differentiate between animal and plant cell	
	C. Identify the cell organelles and list the functions of each organelle	
	D. Explain the methods of transport across a cell membrane	
	E. Describe and differentiate Mitosis and Meiosis	
	Labs: Cell model, cells in action	
IV.	TISSUES AND SYSTEMS: Objectives	10
	A. Identify the characteristics and functions of epithelial, connective, muscle and nervous tissues	
	B. Identify the organs and describe how the organs are integrated into body systems	
	Labs: Tissues – identify different types of tissues under microscope and draw them and note their presence in various parts of the body	

PART II GROWTH and DEVELOPMENT

V.	Integumentary System: Objectives	10
	A. Describe the structure and functions	
	B. Describe temperature regulation	
	C. Explain the healing process in relation to burns to the skin	
	D. Identify and describe the common disorders and diseases of the skin	
	E. Differentiation between regeneration and replication of cells	
	Labs: Calculating percentage of burns, effect of UV light on skin	
VI.	Skeletal System: Objectives	10
	A. Describe the structure and functions of a bone	
	B. Name and classify the major bones of the skeleton	
	C. Diagram and label the microscopic structure of the bone	
	D. Describe the methods of ossification and bone growth, repair	
	E. Classify movements	
	F. Describe the joints and ligaments	
	G. Describe the disorders and diseases of the Skeletal system	
	Labs: Learning the bones using skeletal bones to identify axial and appendicular bones, study of spine abnormalities like Scoliosis, Lordosis, Kyphosis and Disc prolapse and different fractures	
VII.	The Muscular System: Objectives	10
	A. Define the types of muscles and classify based on their shape, location, direction, size and function	
	B. Describe the functional unit of muscle at the cellular level	
	C. Describe the physical and chemical characteristics of muscle tissue	
	D. Describe the skeletal muscle movement at the molecular level	
	E. Differentiate smooth, cardiac and skeletal muscles	
	F. Name the major muscles of the skeletal muscular system	
	G. Identify and describe the disorders and diseases of the muscular system	
	Labs: Action Potential, study of sprain, strain, stress and ROM	

PART III HOMEOSTASIS

VIII.	Reproductive System: Objectives	10
	A. Label the diagrams of male and female reproductive systems	
	B. List the functions of each reproductive structure in males and females	
	C. Describe the hormonal changes and influences during the menstrual cycle	
	D. Describe the human reproduction	
	E. Describe pregnancy and early development of the fetus	
	F. Describe the common disorders and diseases of the reproductive system	
	Labs: Mitosis and Meiosis lab with color beads chains	
IX.	Nervous System: Objectives	10
	A. Diagram and label a neuron	

- B. Classify Neurons and list the cranial nerves and their functions
 - C. Describe the structure and function of parts of brain
 - D. Describe the structure of spinal cord
 - E. Identify the peripheral nerves and describe their distribution
 - F. Label the parts of reflex arc and describe their functions
 - G. Integrate the brain, spinal cord and PNS in the functioning of Nervous system
 - H. Describe the common disorders and diseases of the Nervous system
Labs: Testing Cranial nerves, reflexes
Sheep eye and brain demonstration
- X. **Endocrine System: Objectives** 10
- A. Identify the endocrine glands and describe their location and function
 - B. List the hormones produced by the endocrine glands and describe their function
 - C. Describe the homeostasis and how the hormones play a major role in homeostasis
 - D. Describe the negative and positive feedback
 - E. Describe the common disorders and diseases of the Endocrine system
Labs: Stress test – effect of Adrenalin on Sympathetic Nervous system
- XI. **Circulatory System: Objectives** 10
- A. Diagram and label the parts of the heart
 - B. Describe the circulation of blood through the heart and the body
 - C. Describe the physical and chemical composition of blood
 - D. Describe the cardiac cycle and demonstrate the electrocardiography of the heart
 - E. Name the major arteries and veins of the vascular system
 - F. Explain the process of clotting
 - G. Describe the basis and inheritance blood groups and discuss Rh incompatibility
 - H. Describe the common disorders and diseases of the Cardiovascular system
 - I. Identify the risk factors for heart disease
Labs: Pig Heart demonstration to note the valves and chambers of heart
Vital Signs Lab: Recording of Blood Pressure and Pulse Rate
- XII. **Lymphatic System: Objectives** 10
- A. Identify the major parts of lymphatic system and explain their functions
 - B. Describe the role of white blood cells in the immunity
 - C. Compare different types of immunity
 - D. Describe the T cell deficiency in HIV caused AIDS
 - E. Describe the disorders of immune system
Labs: Simulation of AIDS project, Spread of infection and Body Substance Isolation technique (usage of PPE)
- XIII. **Respiratory System: Objectives**
- A. Identify the organs of respiratory system and describe their functions

- B. Define the respiratory volumes and capacities
- C. Describe the mechanics of external and internal respiration
- D. Describe the common disorders and diseases of the Respiratory system

Labs: Asthma Lab – Spirometry -finding out Vital Lung Capacity, Respiratory Reserve (functional residual capacity), Tidal Volume

Dissection: Sheep lung demonstration

XIV. **Urinary System : Objectives** 10

- A. Diagram and label a nephron
- B. Label the Urinary System and describe the function of each part
- C. Describe the secretion of urine, filtration and re-absorption process
- D. Describe the acid base balance and kidney’s role in homeostasis mechanism
- E. Describe the common disorders and diseases of the Urinary system
- F. Apply the concept of filtration in dialysis in a clinical setting

Labs: Goat kidney demonstration

PART IV ENERGY

XV. **Digestive system: Objectives** 10

- A. Label the alimentary canal and describe the functions
- B. List the enzymes secreted and their functions
- C. Describe the chemical bonds of food molecules
- D. Describe the process of digestion, absorption, assimilation and elimination
- E. Do a dietary analysis and nutritional pyramid
- F. Identify the accessory organs of digestion and describe their function
- G. Describe the common disorders and diseases of the Digestive system

Labs: Making anatomical model of GIT with clay

Total Hours 180

10. Additional Items:

a. Articulation:

b. Academic Credit: 10 units

c. Instructional Strategies:

- lecture
- group discussion
- brain storming
- projects
- reading assignments
- oral reports
- multi-media
- CD-guided practice
- demonstration
- labs include dissections
- role-playing
- virtual simulations
- cooperative groups
- guest speakers
- work-based learning
- critical thinking and problem solving scenarios

d. Instructional Materials:

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1) *Anatomy & Physiology for Health Professions*, an interactive journey Colbert, Ankney, Lee, by Pearson Education, Inc., Upper Saddle River, New Jersey Copyright c 2007

2) *Anatomy & Physiology for Health Professions: An Interactive Journey* (Paperback) by Bruce J. Colbert (Author), Jeff Ankney (Author) student workbook to accompany

- Power points
- handouts
- visual overheads
- realia and models
- video tapes
- Autopsy field trip
- demonstrations
- Internet research

e. Assessment Methods and/or Tools:

- Quizzes/Tests
- Assignments from student work book
- Projects
- Research papers
- demonstrations
- Peer assessments
- Final Exams
- Labs
- Warm ups
- Presentations

f. Key Assignments:

- Design and conduct scientific experiments to assess, evaluate and communicate the problem
- Incorporation of mathematics to analyze the data
- Animal specimen demonstrations to visualize the structures and understand the concepts
- Understanding the physiology and disease process in humans by experimenting and application
- Virtual stimulatory labs to provide depth to understanding the concepts
- Application of concepts in relation to clinical settings
- Using technology and modern methods to understand the clinical approach in health care industry
- Research paper on diseases and disorders of human systems

g. Certificate Competency List:

- Demonstrate the mechanics of homeostasis through learning the structure and the functions of body systems in depth and applying the concepts in a clinical setting
- Demonstrate an understanding of energy, matter and organization through experimentation, critical thinking, and problem solving and group projects
- Master the medical terminology component of each system
- Demonstrate an understanding of human development and growth through various projects by applying the learned concepts.

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- Identify the components of Universal Precautions and Standard precautions

Required proficiency level for certificate of Completion:

1. Overall grade of a “C” or higher for each of the 2 semesters.
2. Minimum student mastery level for each proficiency; perform correctly with direct supervision.
3. Demonstrate occupational specific and general work place skills based on OSHA guidelines.