

La Cañada High School

Course Outline – Medical Biology (Revised)

- I. Course Title** – Medical Biology
- II. Grade Level(s)** – 7 and 8
- III. Length/Credit** – 1 semester / 5 Credits
- IV. Preparations** – None
- V. Course Description**

The course is centered on the language of healthcare (Medical Terminology) and medical abbreviations through a systems approach. Emphasis is on providing students with a thorough understanding of the terminology of body systems and their interrelationships. Each unit will have a lab specific to the topics covered.

Course instruction will consist of the following and students will demonstrate their knowledge in the following areas:

- Ability to analyze and understand medical language
- Ability to identify parts and purpose of body systems and medical language associated with it
- Demonstrate an understanding of the structure of the following body systems - digestive, urinary, nervous, cardiovascular, respiratory, blood, lymphatic and immune, and musculoskeletal
- Demonstrate an understanding of the structure of the skin
- Learn to set the cast on a broken bone, learn the basics of suturing, and developing a model heart valve

VI. Standards/ESLRs Addressed

CA Standards for Career Ready Practice

Standards for Career Ready Practice describe the fundamental knowledge and skills that a career-ready student needs in order to prepare for transition to postsecondary education, career training, or the workforce. These standards are not exclusive to a career pathway, a CTE program of study, a particular discipline, or level of education. Standards for Career Ready Practice are taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

Standards for Career Ready Practice are a valuable resource to CTE and academic teachers designing curricula and lessons in order to teach and reinforce the career-ready aims of the CTE Model Curriculum Standards and the Common Core State Standards.

1. Apply appropriate technical skills and academic knowledge.
2. Communicate clearly, effectively, and with reason.
3. Develop an education and career plan aligned with personal goals.
4. Apply technology to enhance productivity.
5. Utilize critical thinking to make sense of problems and persevere in solving them.

6. Practice personal health and understand financial literacy.
7. Act as a responsible citizen in the workplace and the community.
8. Model integrity, ethical leadership, and effective management.
9. Work productively in teams while integrating cultural and global competence.
10. Demonstrate creativity and innovation.
11. Employ valid and reliable research strategies.
12. Understand the environmental, social, and economic impacts of decisions.

Health Science and Medical Technology Knowledge and Performance Anchor Standards

1.0 Academics: Analyze and apply appropriate academic standards required for successful industry sector pathway completion leading to postsecondary education and employment. Refer to the Health Science and Medical Technology academic alignment matrix for identification of standards.

2.0 Communications: Acquire and accurately use Health Science and Medical Technology sector terminology and protocols at the career and college readiness level for communicating effectively in oral, written, and multimedia formats. (Direct alignment with LS 9-10, 11-12.6)

- 2.1 Recognize the elements of communication using a sender–receiver model.
- 2.2 Identify barriers to accurate and appropriate communication.
- 2.3 Interpret verbal and nonverbal communications and respond appropriately.
- 2.4 Demonstrate elements of written and electronic communication such as accurate spelling, grammar, and format.
- 2.5 Communicate information and ideas effectively to multiple audiences using a variety of media and formats.
- 2.6 Advocate and practice safe, legal, and responsible use of digital media information and communications technologies.
- 2.7 Recognize major word parts of medical terminology including roots, prefixes and suffixes.
- 2.8 Understand and use correct medical terminology for common pathologies.

3.0 Career Planning and Management: Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans. (Direct alignment with SLS 11-12.2)

- 3.1 Identify personal interests, aptitudes, information, and skills necessary for informed career decision making.
- 3.2 Evaluate personal character traits such as trust, respect, and responsibility and understand the impact they can have on career success.
- 3.3 Explore how information and communication technologies are used in career planning and decision making.
- 3.4 Research the scope of career opportunities available and the requirements for education, training, certification, and licensure.
- 3.5 Integrate changing employment trends, societal needs, and economic conditions into career planning.
- 3.6 Recognize the role and function of professional organizations, industry associations, and organized labor in a productive society.
- 3.7 Recognize the importance of small business in the California and global economies.
- 3.8 Understand how digital media are used by potential employers and postsecondary agencies to evaluate candidates.
- 3.9 Develop a career plan that reflects career interests, pathways, and postsecondary options.

4.0 Technology: Use existing and emerging technology to investigate, research, and produce products and services, including new information, as required in the Health Science and Medical Technology sector workplace environment. (Direct alignment with WS 11-12.6)

4.1 Use electronic reference materials to gather information and produce products and services.

4.2 Employ Web-based communications responsibly and effectively to explore complex systems and issues.

4.3 Use information and communication technologies to synthesize, summarize, compare, and contrast information from multiple sources.

4.4 Discern the quality and value of information collected using digital technologies, and recognize bias and intent of the associated sources.

4.5 Research past, present, and projected technological advances as they impact a particular pathway.

4.6 Assess the value of various information and communication technologies to interact with constituent populations as part of a search of the current literature or in relation to the information task.

5.0 Problem Solving and Critical Thinking: Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the Health Science and Medical Technology sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques. (Direct alignment with WS 11-12.7)

5.1 Identify and ask significant questions that clarify various points of view to solve problems.

5.2 Solve predictable and unpredictable work-related problems using various types of reasoning (inductive, deductive) as appropriate.

5.3 Use systems thinking to analyze how various components interact with each other to produce outcomes in a complex work environment.

5.4 Interpret information and draw conclusions, based on the best analysis, to make informed decisions.

5.5 Know how to apply mathematical computations related to health care procedures (metric and household, conversions and measurements).

5.6 Read, interpret, and extract information from documents.

6.0 Health and Safety: Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Health Science and Medical Technology sector workplace environment. (Direct alignment with RSTS 9-10, 11-12.4)

6.1 Locate, and adhere to, Material Safety Data Sheet (MSDS) instructions.

6.2 Interpret policies, procedures, and regulations for the workplace environment, including employer and employee responsibilities.

6.3 Use health and safety practices for storing, cleaning, and maintaining tools, equipment, and supplies.

6.4 Practice personal safety when lifting, bending, or moving equipment and supplies.

VII. Brief Course Outline

Unit 1 - Introduction to Basic Word Structure, Body Regions, and Planes of the Body

Students will work on developing the early skills of identifying the word parts of combining form, suffix, and prefix. These skills are used to develop understanding of how to analyze a word to determine its meaning, begin relating terms to structure and function of the human body, and awareness of spelling and

pronunciation. There is a brief overview about the organization, structure, and division of the body. This unit has vocabulary words related to the theme of each chapter of prefixes, suffixes, and combining form word parts. This unit will also include basic regions and quadrants of the body as well as how the body can be divided up into planes.

Key Assignment

Throughout the course, students will learn basic medical terminology. There will be practice with creating and analyzing medical terms using prefixes, root words, and suffixes.

Unit 2 – Cardiovascular System, Respiratory System

This unit has vocabulary word parts including prefixes, suffixes, and combining forms focusing on the cardiovascular and respiratory systems. It reviews anatomy and physiology of these systems and provides discussion on selected pathology and treatments related to these systems. Students will be introduced to electrocardiograms.

Key Assignment

Students will demonstrate the ability to take blood pressure readings, construct and test a heart valve, and complete various charts. Labs will be performed to determine lung volumes, auscultation of lungs and conduct research on lung cancer and other diseases.

Unit 3 - CPR/First Aid Certification

Students will learn the skill of CPR and basic first aid. They will become certified by a CPR instructor at the end of the unit.

Key Assignment

Students will complete a written and skills test that will allow them to become CPR and first aid certified if they pass.

Unit 4 – Musculoskeletal System, Integumentary System

This unit has vocabulary word parts of prefixes, suffixes, and combining forms focusing on the muscles, bones and skin. It reviews anatomy and physiology of these systems and provides discussion on selected pathology and treatments related to these systems, including skin cancer. A short introduction to x-rays is included with the musculoskeletal system.

Key Assignment

Students will test the efficacy of sunscreens. The effect of ATP on muscle contraction will be measured and students will identify types of bone fractures and then cast them. Strength of casts will be tested. Students will practice individually, suturing on bananas, and then engage as a group in a mock surgery setting (identifying problem and region, making an incision, addressing the problem, and then suturing closed).

Unit 5 - BLS (Basic Life Support)

Students will learn the fundamentals about Basic Life Support organizations, procedures, and responsibilities. Emergency Medical Technicians will be the focus of our BLS organizations. We will learn about what an EMT has to learn to complete their protocol. A guest speaker will come in at the end of the unit to give real world examples and experiences to the students.

Key Assignment

Students will go through the Primary Assessment with a partner in an oral presentation. This presentation will be a skills test in which the student will go through the primary assessment as if they were evaluating a real patient.

Unit 6 – Digestive System and Excretory System

This unit has vocabulary word parts of prefixes, suffixes, and combining forms focusing on the digestive and excretory systems. It reviews anatomy and physiology of these systems. It also provides a discussion on selected pathology and treatments related to these systems. For example, it would include anorexia and flatus, kidney failure and dialysis.

Key Assignment

Students will participate in rotation labs that explain various functions, determine the effect of gravity on peristalsis, and observe the effects of bacteria on digestion. Observation of the process of osmosis with dialysis tubing and how that relates to the kidneys.

Unit 7 - Nervous System

This unit has vocabulary word parts of prefixes, suffixes, and combining forms focusing on the nervous system. It reviews anatomy and physiology of this system and provides discussion on selected pathology and treatments related to these systems. For example, it would include Parkinson disease, multiple sclerosis, epilepsy, and Alzheimer disease.

Key Assignment

Students will perform tests to determine the relationship between smell and taste, and the variation of sensory receptors in different parts of the body.

Unit 8 - ALS (Advanced Life Support)

Students will learn the fundamentals about Advanced Life Support organizations, procedures, and responsibilities. Paramedics will be the focus of our ALS organizations. We will learn about what a Paramedic has to learn to complete their protocol. We will learn what the differences are between an EMT protocol and a Paramedic protocol. A guest speaker will come in at the end of the unit to give real world examples and experiences to the students.

Key Assignment

Students will be asked to DICE a medication in a skills exam with a partner in an oral presentation.

Unit 9 - Wilderness Medicine

Students will learn the fundamentals of Wilderness Medicine and survival. We will focus on organizations, procedures, and responsibilities. Our organization focus will be Search and Rescue teams. We will learn about the limitations of care in the outdoors because of the lack of city resources. A guest speaker will come in at the end of the unit to reinforce our materials that were covered.

Key Assignment

In groups, students will build an emergency shelter in Hahamongna Park. This shelter will be evaluated based on a rubric provided prior to the skills test.

VIII. Methods of Assessment

Teacher will use project-based instruction, classroom discussion, lecture, group work, labs, and quizzes. Teacher will invite several guest speakers throughout the semester to support student interest in the health care field.

- IX. Materials/Textbook(s)** Teacher created materials. Labs provided by HASPI (Health and Science Pathway Initiative).
- X. Seeking “a-g” Approval** – No.
- XI. Seeking AP Class Approval** – No.