

Murrieta Valley Unified School District
High School Course Outline
2003

Department: Science

Course Title: Advanced Biomedical Science

Course Number: 3555

Grade Level(s): 11-12

Length of Course: 1 year

Prerequisite(s): Successful completion of Integrated Science I and acceptance into the Health Careers Academy.

UC/CSU (A-G) Requirement: D

Brief Course Description: Advanced Biomedical Science meets the UC/CSU “D” Requirement and District graduation requirement for Science. In accordance with UC and CSU requirements, a minimum of 20% class time will include laboratory activities. Advanced Biomedical Science seeks to relate the biological sciences including biochemistry, biotechnology, genetics, cellular functions, and microbiology to the specialized health and medical disciplines of epidemiology, oncology, embryology, parasitology, kinesiology, and virology. Advanced Biomedical Science is a comprehensive examination of the interrelationships of biology and the health sciences which give students a contemporary look at these fields by utilizing the most current research and laboratory techniques. Classroom activities will include training in the use of medical equipment, sterilization techniques, comprehensive dissections, diagnostic tests including aseptic blood and urine analysis, and laboratory procedures such as bacterial growth and gel electrophoresis. Certain Biological and medical topics, equipment, and professions will be presented to students by professional guest lecturers from the medical field.

I. Goals

The student will:

- A. Compare and contrast the major concepts between the biological and medical sciences.
- B. Apply traditional biological concepts, such as the scientific method, to the medical disciplines.
- C. Demonstrate their knowledge by utilizing the most advanced laboratory equipment and techniques available.
- D. Categorize the major human diseases, their pathology and their treatments of the present and past.
- E. Evaluate the differences between bacterial, viral, fungal, and other parasitic diseases, and relate to the medical discipline of epidemiology.

- F. Identify the structure of the gene in terms of its chemistry and expression and relate to other medical disciplines, specifically embryology and oncology.
 - a. Relation to oncology will be based on viral and bacterial reproduction, the operon and gene expression and the function of plasmid DNA in bacteria.
 - b. Relation to embryology will be based on trait and population genetics. Also, the expression or non expression of a gene's protein product and its effect on growth and development.
- G. Define the term "retrovirus" and differentiate the epidemiology of the HIV infection with other retroviruses.
- H. Relate the structure and function of the individual human cellular organelles to overall health.
- I. Relate microbiology with chemistry in terms of DNA and other nucleic acids, enzymatic actions, cellular energy needs (ATP), and metabolism.
- J. Examine the discipline of sports medicines as it relates to kinesiology. The anatomy and physiology of movement will be explored as well as how movement is affected by various types of injuries.
- K. Become proficient in performing, and using equipment related to diagnostic tests such as: stethoscope, blood pressure, aseptic blood tests, urinalysis, vision and hearing tests.
- L. Develop a job related portfolio which will include successful school work and laboratory experiences which relate to the biomedical sciences and other health related occupations.

II. Accountability Determinants

- A. Assessment Methods - Student evaluation will include written examinations, laboratory practicals, portfolio assessment, and written reports.

III. Instructional Materials and Methodologies

- A. Required Textbook(s)

Biology 5th Edition; Worth Publishers, Helena Curtis

Essentials of Anatomy and Physiology; Mosby Publishers, Rod Seeley

Essential of A & P Laboratory Manual; Mosby Publishers, Kevin Patton

Biology, Exploring Life Lab Manual; John Wiley Publishers, Gil Brum

Medical Terminology for Health Professions; Delmar Publishers, Ann Ehrlich

Biomedical Ethics, Opposing Viewpoints; Greenhaven Press, David Bender

Genetic Engineering, Opposing Viewpoints; Greenhaven Press, David

Bender