

Principles of Biomedical Science Syllabus

Course Description/Goals:

Principles of Biomedical Sciences is an exciting and rigorous course where students explore concepts of biology and medicine as they take on roles of different medical professionals to solve real-world problems. Over the course of the year, students are challenged in various scenarios including investigating a crime scene to solve a mystery, diagnosing and proposing treatment to patients in a family medical practice, to tracking down and containing a medical outbreak at a local hospital, stabilizing a patient during an emergency, and collaborating with others to design solutions to local and global medical problems.

Course TEKS/Objectives:

Students take on roles of different medical professionals and are challenged in various scenarios, including investigating a crime scene to solve a mystery, diagnosing and identifying treatment to patients in a family medical practice, tracking down and containing a medical outbreak at a local hospital, stabilizing a patient during an emergency, and collaborating with others to design solutions to local and global medical problems. Students will develop skills in technical documentation to communicate experimental findings and solutions to problems, explore how connections to other disciplines, such as computer science and engineering, shape the future of medicine, and practice collaboration techniques that connect with professionals across any field.

<https://tea.texas.gov/academics/pltw-principles-of-biomedical-science.pdf>

Course Outline:

Semester 1	Semester 2
<ul style="list-style-type: none">• Crime scene documentation and evidence collection• Autopsy procedures and medical examiner roles	<ul style="list-style-type: none">• Infectious disease agents• Immune system functions and immune response

- Biomolecules
- DNA structure, function, and profiling techniques
- Basics of anatomy and physiology of major body systems
- Cause and manner of death determination
- Medical history taking and patient interviewing
- Measuring and interpreting vital signs
- Diagnostic testing (blood analysis, urinalysis, imaging)
- Cardiovascular and respiratory system functions and disorders
- Chronic disease case studies
- Patient care ethics and HIPAA guidelines

- Epidemiology principles and outbreak investigation
- Disease transmission and prevention strategies
- Emergency response protocols
- Designing public health education materials
- Identifying unmet medical needs
- Brainstorming and evaluating biomedical innovations
- Prototyping and testing medical devices or processes
- Applying engineering design principles in healthcare
- Team collaboration and project management
- Presenting and pitching biomedical solutions