PLTW Biomedical Sciences Courses

Principles of Biomedical Sciences (PBS)

This course introduces students to human body systems and health conditions. They determine factors that lead to the death of a fictional person and investigate lifestyle choices and medical treatments that might have prolonged the person's life. They are introduced to human physiology medicine, research processes and bioinformatics. Their study includes homeostasis, metabolism, trait inheritance, and defense against disease.

Human Body Systems (HBS)

This course introduces students to interactions within the human body. They design experiments, investigate body structures and use data acquisition software to monitor body functions such as muscle movement, reflex and voluntary action, and respiration. Students build organs and tissues on a skeletal manikin and work through real-world cases.

Medical Interventions (MI)

This course introduces students to interventions that include prevention, diagnosis and treatment of disease as they follow the lives of a fictitious family. It is a "how to" manual for maintaining overall health and homeostasis in the body. Each family scenario introduces multiple types of interventions and reinforces concepts learned in previous courses.

Biomedical Innovation (BI)

This course is the capstone research and development course. Students work to design innovative solutions for the health challenges of the 21st century as they work through progressively challenging open-ended problems addressing topics such as clinical medicine, physiology, biomedical engineering and public health. They have the opportunity to work on an independent project as well.

PLTW Gateway To Technology Units

This course of study is geared toward grades 6-8. The 6-9 week themed units are focused on: engineering design and modeling; automation and robotics; energy and the environment; flight and space; science of technology; and science of analog and digital electronics.

PROJECT LEAD THE WAY

PLTW

PLTW Goals

- **Increase the number of young people who pursue STEM programs requiring a four or two-year college degree.**
- **Provide equitable and inclusive opportunities for all academically qualified students without regard to gender or ethnic origin.**
- **Provide clear standards and expectations for student success in the program.**
- **Reduce the future college attrition rate with four and two-year STEM programs.**
- **Provide leadership and support that will produce continuous improvement and innovation in the program.**
- **Contribute to the continuance of America's prosperity.**

PLTW Quick Facts

- **Located in 50 states and District of Columbia**
- **Currently 4000 registered schools**
- **100 post secondary partnerships**
- **PLTW professional development plan that includes:**
  Level 1: Initial 2 week training on college campus for teachers. Online virtual training for teachers.
  Level 2: more in depth 1 week training on college campus for teachers. Master teacher level status for qualified teachers.

http://www.pltw.org

SAN JOSÉ STATE UNIVERSITY

CHARLES W. DAVIDSON COLLEGE OF ENGINEERING

Engineering Pathways to Success

PLTW Engineering Courses

Introduction to Engineering (IED)
This course introduces students to the engineering design process. They develop their engineering portfolio that will follow them through all the courses. Working in teams they learn how to use sketching as a means to communicate their ideas as well as the geometry that is used in parametric modeling, assembly, and motion constraints. They explore the production and marketing of products.

Principles of Engineering (POE)
This course covers the different types of engineering, the communication and documentation that are used by engineers. Mechanisms, thermodynamics, fluid systems, electrical systems and control systems are also covered. Using the appropriate formulas students make static and strength calculations for various materials before testing them. They explore the fields of reliability engineering and kinematics.

Digital Electronics (DE)
This course covers the fundamentals of analog and digital electronics. Students learn about the different number systems used in the design of digital circuitry. They design circuits to solve open ended problems, assemble their solutions, and troubleshoot them as necessary. Simplification of Boolean expressions, application of truth tables, and kmapping techniques are also covered. Students then use combinational logic, integrated circuits, and microprocessors to solve open ended problems.

Aerospace Engineering (AE)
This course exposes students to the world of aeronautics, flight, and engineering. Students working in teams are engaged in engineering design problems related to aerospace information systems, astronautics, rocketry, propulsion, the physics of space science, space life sciences, the biology of space science, principles of aeronautics, structures and materials, and systems engineering.

Biotechnical Engineering (BE)
This course involves the exploration of biomedical engineering, bio-molecular genetics, bioprocess engineering, agricultural and environmental engineering. Through engineering design projects students learn about biomechanics, genetic engineering, cardiovascular engineering, agricultural biotech, tissue engineering, biomedical devices, forensics, and bio-ethics. They apply biological and engineering concepts to design materials and processes that directly measure, repair, improve, and extend living systems.

Civil Engineering and Architecture (CEA)
This course involves a long-term project that develops a local property site. As students learn the various aspects of civil engineering and architecture, they apply what they learn to the design and development of this property. It is structured to enable all students to have a variety of experiences that provide an overview of both fields. Students work in teams, exploring hands-on projects and activities to learn the characteristics of civil engineering and architecture.

Computer Integrated Manufacturing (CIM)
This course involves the application of 3D computer modeling in the manufacturing and industrial engineering fields. Students learn the programming codes for computer numerical control by writing a program,putting it into the computer milling software and simulating the creation of the part. Students design a product using the 3D computer modeling software, translate it into the CNC code, and mill it. Robotics is learned by programming various standalone routines and handshaking them with the CNC mill. Computer integrated manufacturing assembly lines are designed, built, and programmed using scaled industrial parts.

Engineering Design & Development (EDD)
This course is the capstone research and development course. Students working as individuals or on teams draw from all their previous experiences in the other engineering courses. They select a problem, design a solution, conduct patent research, build a prototype, conduct testing of the prototype, evaluate the test results, and present their conclusions to an engineering panel. The project is a yearlong course that involves guided independent research by the teacher and engineering/industry mentors. Many students go on to register their solutions with the United States Patent Office.