

STEM Programs

STEM (Science, Technology, Engineering, and Math) programs offer students hands-on, project-based experiences to engage students on multiple levels, expose them to unique areas of study, and provide them with a foundation and proven path to college and career success. We have partnered with Project Lead the Way (PLTW) for many of our STEM offerings, as PLTW is the leading provider of rigorous and innovative STEM education curricular programs used in schools. PLTW exists to prepare students for the global economy through its world-class curriculum, high-quality professional development, and an engaged network of educators, students, universities, and professionals. PLTW's comprehensive curriculum has been collaboratively designed by PLTW teachers, university educators, engineering and biomedical professionals, and school administrators to promote critical thinking, creativity, innovation, and real-world problem-solving skills in students. More than 4,700 schools in all 50 states and the District of Columbia are currently offering PLTW courses to their students. For more details, go to www.pltw.org.



PLTW GATEWAY

The **PLTW Gateway** program sparks students' passion for discovery through hands-on exploration of topics like coding, robotics, flight, space, human body systems, and crime scene analysis. By solving real-world problems in collaborative settings, students stretch their imaginations and connect learning to everyday life, while gaining valuable insights into various career paths.

This program provides a solid foundation for future STEM learning, using advanced tools and software to apply math, science, technology, and engineering to real-world challenges. Composed of eight independent, nine-week units, students can choose one or two years of study, preparing them for high school STEM courses (though Gateway courses are not required for enrollment in high school STEM).

PLTW AEROSPACE AND STEM Honors (6)

PLTW Aerospace and STEM Honors blasts off into the exciting world of aerospace and cutting-edge science! In this hands-on course, students will become engineers as they design, prototype, and test models to explore the principles of flight, space travel, and the challenges of living beyond Earth. They'll also dive into physics, chemistry, and nanotechnology, applying scientific concepts to real-world STEM projects like cleaning up oil spills, creating nanomaterials, and even making ice cream. From planning a mission to Mars to solving modern engineering challenges, students will gain a deeper understanding of the science and technology shaping our world—and beyond!

Prerequisite: teacher recommendation

Full year; 1 MS credit

Fulfills the Elective requirement

PLTW MEDICAL DETECTIVES AND ROBOTICS Honors (7)

PLTW Medical Detectives and Robotics Honors explores the fascinating connections between the human body and the world of machines. In this dynamic and hands-on course, students will take on the role of medical detectives, uncovering how the body's systems work together to maintain health and solve medical mysteries. Then they'll dive into the mechanics of engineering, exploring energy transfer, machine automation, and computer control systems. Through interactive projects and real-world problem-solving, students will develop a deep understanding of biological and mechanical systems—preparing them to think like scientists, engineers, and future innovators.

Prerequisite: teacher recommendation

Full year; 1 MS credit

Fulfills the Elective requirement

PLTW ENGINEERING AND INNOVATION Honors (8)

PLTW Engineering and Innovation Honors invites students to unleash their creativity and curiosity in this exciting, hands-on course. First, students will explore the design process, learning how innovation shapes the world around them. Then they will dive into the fascinating world of atoms, electricity, and their real-world applications. Through interactive projects and problem-solving challenges, students will develop a deeper understanding of both creative design and scientific principles—preparing them to think like inventors, engineers, and future innovators.

Prerequisite: teacher recommendation

Full year; 1 MS credit

Fulfills the Elective requirement



PATHWAY TO ENGINEERING

The **PLTW Pathway To Engineering (PTE)** program is a sequence of courses that follow a proven hands-on, real-world problem-solving approach to learning. Throughout PTE, students learn and apply the design process, acquire strong teamwork and communication proficiency, and develop organizational, critical-thinking, and problem-solving skills. They discover the answers to questions like how things are made and what processes go into creating products. Students use the same industry-leading 3D design software used by companies like Intel, Lockheed Martin, and Pixar. They explore aerodynamics, astronautics, and space life sciences. They design, test, and actually construct circuits and devices such as smartphones and tablets, and work collaboratively on a culminating capstone project. It's STEM education at the heart of today's high-tech, high-skill global economy. PTE courses complement traditional mathematics and science courses.

The program is designed to prepare students to pursue post-secondary education and careers in STEM-related fields.

INTRODUCTION TO ENGINEERING DESIGN (IED) Honors (9-12)

Introduction to Engineering Design Honors is designed for 9th and 10th-grade students; the major focus of IED involves learning how to use 3D modeling as an effective mode of visual communication for three-dimensional ideas and creations. Through hands-on projects, students apply engineering standards and document their work. Students will use industry-standard 3D modeling software to help them design solutions for solving proposed problems, document their work using an engineer's notebook, and communicate solutions to peers and members of the professional community.

Prerequisite: teacher recommendation

Full year; 1 credit

Fulfills the Elective graduation requirement

CIVIL ENGINEERING AND ARCHITECTURE (CEA) Honors (10-12)

Civil Engineering and Architecture Honors students learn about various aspects of civil engineering and architecture and apply their knowledge to the design and development of residential and commercial properties and structures. Students develop a comprehensive project taking into account all disciplines of design that culminate into full set of construction documentation. Students communicate and present solutions to their peers and members of a professional community of engineers and architects.

Prerequisite: IED; teacher recommendation

Full year; 1 credit

Fulfills the Fine Art or Elective graduation requirement

PRINCIPLES OF ENGINEERING (POE) Honors (11-12)

Principles of Engineering (POE) Honors is designed for 11th and 12th-grade students. This survey course exposes students to major concepts they will encounter in a post-secondary engineering course of study. Topics include mechanisms, energy, statics, materials, and robotics (designing, building, and programming robots using VEX). The course will help them learn to develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges, document their work, and communicate solutions.

Prerequisite: IED, CEA; teacher recommendation

Full year; 1 credit

Fulfills the Elective graduation requirement

ENGINEERING DESIGN AND DEVELOPMENT (EDD) Honors (12)

Engineering Design and Development Honors is the capstone course in which students work in teams to design and develop an original solution to a valid open-ended technical problem by applying the engineering design process. Students perform research to choose, validate, and justify a technical problem. After carefully defining the problem, teams design, build, and test their solutions while working closely with industry professionals who provide mentoring opportunities. Finally, student teams present and defend their original solution to an outside panel.

Prerequisite: IED, CEA, POE; teacher recommendation

Full year; 1 credit

Fulfills the Elective graduation requirement



ARCHITECTURE

ARCHITECTURE 1 (9-12)

Architecture 1 is generally organized in a studio setting, with one day a week dedicated to architectural history. During studio days, students are exposed to all areas of the architectural profession, including technical and manual skills such as sketching, manual drafting, model making, and 3D Computer Assisted Design (CAD). Throughout the first semester, each student is assigned bi-weekly design exercises geared toward demonstrating the techniques used in class. The first semester of study culminates with an individual design project that involves independent study and research. Term projects are presented before a panel of professionals who evaluate and rate each student's presentation. In the second semester, students are exposed in greater depth to actual construction through site visits and numerous design problem assignments, culminating with a term project. Each exercise is graded on accuracy, quality of work, use of architectural technique, and presentation.

Prerequisite: none

Full year; 1 credit

Fulfills the Fine Art or Elective graduation requirement

Not included in GPA.

ARCHITECTURE 2 Honors (10-12)

Architecture 2 Honors is a comprehensive class that allows students to take a project from initial site documentation to full architectural construction documents. Students work on CAD throughout the year. History is still present within course and assessed by means of essays.

Prerequisite: Architecture 1; teacher recommendation

Full year; 1 credit

Fulfills the Fine Art or Elective graduation requirement



BIOMEDICAL SCIENCES

The **PLTW Biomedical Sciences (BMS)** Program is a sequence of courses that follow a proven hands-on, real-world problem-solving approach to learning. Students explore the concepts of human medicine and are introduced to topics such as physiology, genetics, microbiology, and public health. Through activities, like dissecting a heart, students examine the processes, structures, and interactions of the human body – often playing the role of biomedical professionals. They also explore the prevention, diagnosis, and treatment of disease, working collaboratively to investigate and design innovative solutions to the health challenges of the 21st century, such as fighting cancer with nanotechnology. Throughout BMS, students acquire strong teamwork and communication practices and develop organizational, critical-thinking, and problem-solving skills. Along the way, students investigate a variety of careers in biomedical sciences. The program is designed to prepare students to pursue post-secondary education and careers in biomedical sciences.

PRINCIPLES OF BIOMEDICAL SCIENCES (PBS) Honors (9-12)

Principles of Biomedical Science Honors students investigate various health conditions, including heart disease, diabetes, sickle-cell disease, hypercholesterolemia, and infectious diseases. Students determine the factors that led to the death of a fictional person and investigate lifestyle choices and medical treatments that might have prolonged the person's life. The activities and projects introduce students to human physiology, medicine, and research processes. This course provides an overview of all the courses in the Biomedical Sciences program and lays the scientific foundation for subsequent courses. This course is designed for 9th or 10th-grade students.

Prerequisite: teacher recommendation

Full year; 1 credit

Fulfills the Elective graduation requirement

HUMAN BODY SYSTEMS (HBS) Honors (10-12)

Human Body Systems Honors students examine the interactions of human body systems as they explore identity, power, movement, protection, and homeostasis. Students design experiments, investigate the structures and functions of the human body, and use data acquisition software to monitor body functions such as muscle movement, reflex, and voluntary action, and respiration. Exploring science in action, students build organs and tissues on a human anatomy model and work through interesting real-world cases and often play the roles of biomedical professionals to solve medical mysteries.

Prerequisite: PBS; teacher recommendation

Full year; 1 credit

Fulfills the Elective graduation requirement

MEDICAL INTERVENTIONS (MI) Honors (11-12)

Medical Interventions Honors students investigate a variety of interventions involved in the prevention, diagnosis, and treatment of disease as they follow the life of a fictitious family. The course is a "How-To" manual for maintaining overall health and homeostasis in the body. Students explore how to prevent and fight infection; screen and evaluate the code in human DNA; prevent, diagnose and treat cancer; and prevail when the organs of the body begin to fail. Through these scenarios, students are exposed to a range of interventions related to immunology, surgery, genetics, pharmacology, medical devices, and diagnostics. This course is designed for 11th or 12th-grade students.

Prerequisite: PBS, HBS; teacher recommendation

Full year; 1 credit

Fulfills the Elective graduation requirement

BIOMEDICAL INNOVATION (BI) Honors (12)

Biomedical Innovation Honors students design innovative solutions for the health challenges of the 21st century. 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 with a mentor or advisor from a university, hospital, research institution, or the biomedical industry. Throughout the course, students are expected to present their work to an audience of STEM professionals.

Prerequisite: PBS, HBS, MI; teacher recommendation

Full year; 1 credit

Fulfills the Elective graduation requirement



COMPUTER SCIENCE

The **Computer Science** program of study engages high school students in computational thinking. This program comprises introductory, foundation, and specialty courses. The emerging course of study begins with Introduction to Computer Science (ICS) and is followed by two Advanced Placement courses: Computer Science Principles (CSP) and Computer Science A (CSA). All significant computer science courses build upon a foundation of mathematical reasoning that should be acquired before attempting such a course.

INTRODUCTION TO COMPUTER SCIENCE (ICS) Honors (9-12)

Introduction to Computer Science Honors addresses programming, physical computing, HTML/CSS, digital data, artificial intelligence, and machine learning. Students create authentic artifacts and engage with computer science as a medium for creativity, communication, problem-solving, and fun. Web development, animations and games, the design process, data analysis, programming skills, and hardware are introduced in a developmental and sequential approach.

Prerequisite: science and math teacher recommendation

Full year; 1 credit

Fulfills the Elective graduation requirement

COMPUTER SCIENCE PRINCIPLES (CSP) AP* (10-12)

Computer Science Principles AP is a college-level computer science course. Students learn about computer innovations as well as the collaborative processes used to design, build, and test applications. They also learn how computers consume and use data, algorithms, computing systems and networks, internet protocols, and the impact of computing, including privacy and security. Students learn basic programming constructs such as variables, boolean expressions, conditionals, functions, lists, and loops. Students design and build an original application using the Python programming language.

Prerequisite: grade of B- or higher in ICS; computer science and math teacher recommendation

Full year; 1 credit

Fulfills the Elective graduation requirement

COMPUTER SCIENCE A (CSA) AP* (11-12)

Computer Science A is a college-level computer science course. Students master object-oriented programming concepts such as designing and writing classes and methods, encapsulation, and recursion. They attain mastery of core Java programming constructs such as java primitive types, boolean expressions, iteration, arrays, ArrayLists, and objects. Students analyze, design, and code solutions and algorithms in response to written requirements.

Prerequisite: grade of A- or higher in ICS and CSP; computer science and math teacher recommendation

Full year; 1 credit

Fulfills the Elective graduation requirement



TECHNOLOGY

We live in an age when technology progresses at exponential speeds. Riviera is committed to giving our students opportunities to keep abreast with the growth of technology through quality, technological course offerings. Our courses include developing an introductory level of competency in numerous computer applications, e.g., Word, Excel, PowerPoint, etc. There is also the opportunity to learn the most up-to-date technology in the field of publishing, both print media and online publishing. Other courses address the latest technological advancements in the field of broadcast journalism, through the writing, research, field-reporting, interviewing, on-camera delivery, and editing so necessary for accurate journalistic reporting. Finally, there are courses for those who may wish to delve deeper into the technology of computers, including addressing the needs of beginning students, as well as those more advanced students seeking education in computer programming and software engineering.

BROADCAST JOURNALISM 1 (9-12)

Broadcast Journalism 1 provides an introduction to broadcast news media. The course immerses students in all aspects of broadcast journalism, including writing, research, field reporting, interviewing, on-camera delivery, and editing. Students explore different types of news stories and learn to effectively execute the school's announcements. At the end of the year, students compile an online portfolio representing their best work from the course. This performance-based course is writing and public speaking intensive.

Prerequisite: English teacher recommendation

Full year; 1 credit

Fulfills the Fine Art or Elective graduation requirement

Not included in GPA.

BROADCAST JOURNALISM Honors (10-12)

Broadcast Journalism Honors takes students through the process of creating non-fiction TV programming. Students strengthen the skills they learned in Broadcast Journalism 1, using cameras, sound recording equipment, and editing software, and apply those skills to several short productions. Students have the opportunity to produce commercial advertisements, news packages, talk shows, reality programs, blogs, and documentaries. Particular emphasis is placed on creating a concept, writing a proposal, casting a program, and developing a marketing rationale. Students become acquainted with various careers in the journalistic field.

Prerequisite: Broadcast Journalism 1; teacher recommendation

Elective may be repeated.

Full year; 1 credit

Fulfills the Fine Art or Elective graduation requirement

INTRODUCTION TO JOURNALISM HONORS (7-8)

Introduction to Journalism Honors lays the groundwork for future multimedia journalists and yearbook editors, focusing on news writing, ethical reporting, photography basics, and design principles for yearbook and website layouts. Throughout the class, students delve into core journalism principles, master storytelling, understand ethical reporting, copyright law, and learn to navigate media responsibly. Students also gain hands-on experience in photography and layout design, honing skills essential for effective visual storytelling.

Prerequisite: grade of B+ or higher in English Honors or Pre-AP; teacher recommendation

Elective may be repeated.

Full year; 1 credit

Fulfills the Elective requirement



MULTIMEDIA JOURNALISM Honors (9-12)

Multimedia Journalism Honors is a year-long elective devoted to the publication of the student news website. The course enables students to develop basic skills in the production of digital journalistic media and in the fundamental skills of oral and visual communication, including project management, research, public speaking, organization, publishing, and marketing. Students will gain experience in writing, photography, graphic design, layout design, and web design by covering school-related news, feature stories, social issues, arts and culture, and sporting events that take place on and off campus and within Riviera schools and the local community. In addition, students will work with DSLR cameras and gain foundational experience in website design. Please note that students selecting this class will have assignments and work that are outside of the scheduled class time.

Prerequisite: teacher recommendation

Elective may be repeated.

Full year; 1 credit

Fulfills the Fine Art or Elective graduation requirement

YEARBOOK JOURNALISM Honors (9-12)

Yearbook Journalism Honors students design and produce the yearbook. It provides students with marketable experience in print media publishing. Activities include interviewing, feature writing, magazine layout, photo editing, sales design, advertising, and all elements of computerized text layout, graphic art, and digital photography. The class works closely with Creative Writing and/or Journalism students in their production of the yearbook and other school publications.

Prerequisite: 1 teacher recommendation

Elective may be repeated.

Full year; 1 credit

Fulfills the Fine Art or Elective graduation requirement