ERIE ACADEMY OF ENGINEERING & AEROSPACE

Erie High School offers a comprehensive 4-year Engineering Academy designed to equip students with the knowledge and skills necessary for success in engineering fields. By completing the program, students will earn a diploma seal and cord, and have the opportunity to obtain industry certifications.

Key Program Features:

- **Hands-on Learning:** Through engaging projects and real-world applications, students will gain practical experience and develop critical thinking skills.
- **Rigorous Academic Preparation:** A strong emphasis on math and science, including honors and AP courses, ensures students are well-prepared for college-level engineering programs.
- **Capstone Project:** Senior year culminates in a collaborative engineering project that showcases students' specialized skills and knowledge.
- **Industry Certifications:** Students have the opportunity to earn industry certifications, enhancing their employability and career prospects.

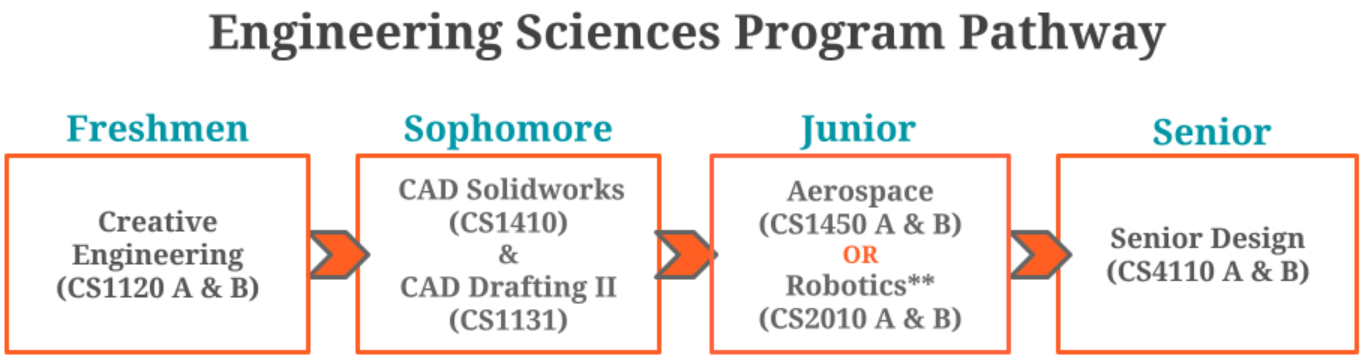
For more information on the Academy of Engineering & Aerospace, please contact:

- Chris Schmitz: schmitz_christopher@svvsd.org
- Katie Spendlow: spendlow_katlyn@svvsd.org

NO APPLICATION REQUIRED

Engineering Pathway

Note that requirements for this pathway begin with the graduating class of 2025; previous classes should refer to archived course description books and discuss with their counselor/pathway teacher or see images below.



***Competitive Robotics will only be counted towards these requirements if taken during student's sophomore, junior, or senior year*

Additional Course Requirements	AP Physics	AP Pre Calc **OR** AP Calculus **OR** AP Statistics	AP Computer Science Principles *This course is **recommended but not required** for program completion; it is **required** for students pursuing the Robotics Industry Certification.*

**Students must earn a 3.5+ cumulative GPA and earn at least a C in each engineering course to earn Engineering Diploma*

English, social studies, and other required courses for SVVSD graduates not represented in the above diploma pathway. See course description book for those details.

FRESHMAN LEVEL COURSES

CS1120A & CS1120B Creative Engineering (2 semester class) **Grade 9** **2 semester/1 credit**
Elective Credit
Practical Art Elective
Prerequisite or concurrent: Algebra 1

This foundational 9th-grade course is designed to spark students' interest in engineering and equip them with essential skills. Students will delve into the diverse world of engineering, exploring mechanical and electrical systems. They will learn to apply engineering principles to solve real-world problems through engaging, hands-on projects.

By mastering project management techniques, students will develop the ability to plan, execute, and evaluate their work effectively. This course will also introduce students to the field of robotics and the fundamentals of programming, empowering them to create and control automated systems.

This course will lay the groundwork for more advanced engineering studies in the upper grades and prepare students for future success in STEM fields.

SOPHOMORE LEVEL COURSES

CS1410 CAD Drafting - SolidWorks (formerly CS1130, 1 semester class) Grade 10-12 1 semester/.5 credit
Elective Credit
Practical Art Elective
Prerequisite or concurrent: Intro to Engineering

This semester-long course serves as a comprehensive introduction to SolidWorks, a powerful Computer-Aided Design (CAD) software widely used in engineering, product design, and manufacturing industries. The course is designed to provide students with a solid foundation in 3D modeling, assembly design, and parametric sketching through a hands-on, project-based approach.

CS1131 CAD Drafting II (1 semester class) **Grade 11-12** **1 semester/.5 credit**
Elective Credit
Practical Art Elective
Prerequisite or concurrent: CAD Drafting - Solidworks

Building on the foundational knowledge acquired in the Introduction to SolidWorks CAD course, the Advanced SolidWorks CAD class delves deeper into sophisticated modeling techniques, advanced simulation, and collaborative design practices. This semester-long course is designed to empower students with an in-depth understanding of SolidWorks, enabling them to tackle complex design challenges encountered in professional settings. Students will earn a voucher to take the CSWA - Certified SolidWorks Associate - 180 minute exam at the end of the course. ***(Note: Completion of this exam requires an additional 90 minute block during finals).***

JUNIOR LEVEL COURSES

CS1450A & 1450B Aerospace Engineering (this is a year long class) Grade 11-12 2 semesters/1.0 credit

Elective Credit
Practical Art Elective
Prerequisite or concurrent: Creative Engineering, CAD Drafting and CAD Drafting II

This course delves into the fascinating world of atmospheric and space flight. Students will gain a deep understanding of the principles governing flight, from aerodynamics to rocket propulsion. To solidify their learning, they will engage in hands-on projects, designing and testing balsa wood planes, rockets, and weather balloons.

By participating in the American Rocketry Challenge, a prestigious national competition, students will apply their knowledge and skills to real-world challenges, fostering creativity, problem-solving, and teamwork. This course provides a solid foundation for future studies in aerospace engineering, physics, and related fields.

OR

CS2010 A & CS2010 B Adv Eng 1: Robotics (this is a year long class) Grade 9-12 2 semesters/1 credit

Elective Credit
Practical Art Elective
Prerequisite or concurrent: Creative Engineering, CAD Drafting and CAD Drafting II, or Teacher Approval
Recommended, not required: AP Computer Science Principles

Advanced robotics course for students who have taken **CS1120 Creative Engineering & CS1410 CAD Drafting - SolidWorks** or have proven strong robotics engineering fundamentals, work ethic, and self-regulation.This course is designed for advanced robotics students. It focuses on complex mechanical design, advanced programming, strategic thinking, teamwork, and professional ethics. The goal is to prepare students for high-level VEX Robotics competition.

Key Topics:

- **Advanced Mechanical Design:** CAD, stress analysis, mechanism design, 3D printing
- **Advanced Programming:** C++, Python, sensor fusion, computer vision, AI
- **Strategic Thinking:** Game analysis, robot optimization, competition preparation
- **Teamwork and Leadership:** Effective communication, conflict resolution, project management
- **Professionalism and Ethics:** Engineering ethics, intellectual property, safety

By the end of the course, students will be skilled in designing, building, and programming competitive VEX robots, while developing strong problem-solving, teamwork, and leadership abilities.

SENIOR LEVEL COURSE

CS4110A & 4110B Senior Engineering Design Project, "Senior Design" (this is a year long class)

Practical Art Elective Grade 11-12 2 semesters/1.0 credit
Elective Credit
Prerequisite: Creative Engineering, CAD Drafting I & CAD Drafting II, Aerospace Engineering or Robotics **AND** Teacher Approval

This capstone course culminates the EHS Engineering pathway, providing students with the opportunity to apply their acquired knowledge and skills to real-world challenges. Working in small teams, students choose a high-impact project, such as participating in the NASA HUNCH, NASA HERC, or NASA Student Launch Challenges. They embark on a rigorous process of research, design, prototyping, and testing to develop innovative solutions.

Students gain invaluable experience in problem-solving, critical thinking, teamwork, and project management. They also hone their presentation skills by sharing their work with the public at the SVVSD STEM Expo in May.

Successful completion of this course not only earns students the EHS Engineering Honors Diploma but also equips them with the necessary foundation to excel in post-secondary engineering programs and beyond.

OPTIONAL COURSES (not required for pathway but support program success)

CS5110A & 5110B AP Computer Science Principles (year long class) Grade 10-12 2 semesters/1.0 credit
Practical Art Elective Prerequisite or concurrent: Algebra 1 AP Fee Required
Estimated homework: approximately 45 minutes per class session.

This AP class is open to students with no prior programming experience, but Intro to Programming is recommended. This is equivalent to a CS50-level college course, and students use the rigorous and fun CS50AP curriculum from Harvard University. Students learn about the internet, digital information, programming (using Scratch, JavaScript, and C), and cybersecurity.

CS5010A and CS 5010B AP Computer Science A (year long class) Grades 9-12 2 semesters/1.0 credit
Practical Art Elective AP Fee Required
Recommended, not required for Engineering Pathway
Prerequisite: AP Computer Science Principles or by teacher recommendation
Estimated homework time: one hour per one hour of class time

AP Computer Science teaches object-oriented and procedural problem solving and design using the Java language. These techniques represent proven approaches for developing solutions that can scale up from small, simple problems to large, complex problems. The AP Computer Science is compatible with many CS1 courses in colleges and universities.