



Program of Study Course Sequence	9th Grade	10th Grade	11th Grade	12th Grade
Cybersecurity	Computer Science Essentials (1 credit) <i>Prerequisite:</i> <i>Algebra I</i>	Cybersecurity (1 credit) <i>Prerequisite:</i> <i>Computer Science Essentials</i>	Cybersecurity Capstone (1 credit) AND Digital Forensics (1 credit) <i>Prerequisite:</i> <i>Cybersecurity</i>	Practicum in Information Technology: Cybersecurity (2 credits) <i>Prerequisite:</i> <i>Cybersecurity Capstone and Digital Forensics</i>
Programming and Software Development	Computer Science I Honors (1 credit) <i>Prerequisite:</i> <i>Algebra I</i>	AP Computer Science (2 credits but taught in 1 period) <i>Prerequisite:</i> <i>Computer Science I Honors</i>	Computer Science II (1 credit) AND Computer Science III (1 credit) <i>Prerequisite: AP Computer Science</i>	Practicum in Information Technology: Programming and Software Development (2 credits) <i>Prerequisite:</i> <i>Computer Science II and III</i>

Certifications / Certificate Opportunities Based on Program of Study
<p>Microsoft Technology Associate (MTA) Security Fundamentals (Cybersecurity)</p> <p>ISACA CSX Cybersecurity Fundamentals Certificate (Cybersecurity)</p> <p>CompTIA Security+ (Cybersecurity)</p> <p>GIAC Information Security Fundamentals (GISF) (Cybersecurity)</p> <p>(ISC)2 Systems Security Certified Practitioner (SSCP) (Cybersecurity)</p>
<p>Career and Technical Student Organization (CTSO)</p> <p>SkillsUSA</p>

Additional Course Information
<p>Credits: AP Computer Science can be used for math credit.</p> <p>Fees: Career and Technical Student Organizations are co-curricular to the curriculum. Although membership is not required, it is highly encouraged for students to join their local CTSO chapter. Fees may apply.</p> <p>Location: Courses shaded in gray will be taught at the Keller Center for Advanced Learning.</p>



© JSD Photography

Computer Science Essentials

TEDS: 03580140

KISD: 82334

Credit: 1

Grade: 9-12

Prerequisite: Complete or concurrent enrollment in Algebra I

This PLTW course will be the foundation for the cybersecurity pathway. It will empower students to develop computational thinking skills while building confidence that prepares them to advance to subsequent cybersecurity courses. With emphasis on computational thinking and collaboration, this year-long course provides an excellent entry for students to begin or continue the PLTW experience. This course will expose students to a diverse set of computational thinking concepts, fundamentals, and tools, allowing them to gain understanding and build confidence. Students will use visual, block-based programming and seamlessly transition to text-based programming with languages such as Python to create apps and develop websites and learn how to make computers work together to put their design into practice. They will apply computational thinking practices, build their vocabulary, and collaborate just as computing professionals do to create products that address topics and problems important to them.

Cybersecurity

TEDS: 03580850

KISD: 82333

Credit: 1

Grade: 10-12

Recommended prerequisite: Computer Science Essentials

In this Project Lead the Way course, students are introduced to the tools and concepts of cybersecurity and encouraged to create solutions that allow people to share computing resources while protecting privacy. Nationally, computational resources are vulnerable and frequently attacked; in Cybersecurity, students solve problems by understanding and closing these vulnerabilities. This course raises students' knowledge of and commitment to ethical computing behavior, where they will develop the knowledge and skills needed to explore advanced concepts related to the ethics, laws, and operations of cybersecurity. It also aims to develop students' skills as consumers, friends, citizens, and employees who can effectively contribute to communities with a dependable cyber-infrastructure that moves and processes information safely.

Digital Forensics

TEDS: 03580360

KISD: 82375

Credit: 1

Grade: 11-12

Recommended prerequisite: Cybersecurity

Digital forensics is an evolving discipline concerned with analyzing anomalous activity on computers, networks, programs, and data. As a discipline, it has grown with the emergence of a globally connected digital society. As computing has become more sophisticated, so too have the abilities of malicious agents to access systems and private information. By evaluating prior incidents, digital forensics professionals have the ability to investigate and craft appropriate responses to disruptions to corporations, governments, and individuals. Whereas cybersecurity takes a proactive approach to information assurance to minimize harm, digital forensics takes a reactive approach to incident response. The course provides a survey of the field of digital forensics and incident response, including ethics and laws and digital citizenship.



Cybersecurity Capstone

TEDS: 03580855

KISD: 82336

Credit: 1

Grade: 11-12

Recommended prerequisite: Digital Forensics and Computer Maintenance

Cybersecurity is an evolving discipline concerned with safeguarding computers, networks, programs, and data from unauthorized access. The field has gained prominence with the emergence of a globally connected society. As computing has become more sophisticated, so too have the abilities of malicious agents looking to penetrate networks and seize private information. By evaluating prior incidents, cybersecurity professionals have the ability to craft appropriate responses to minimize disruptions to corporations, governments, and individuals. In the Cybersecurity Capstone course, students will develop the knowledge and skills needed to explore advanced concepts related to the ethics, laws, and operations of cybersecurity. Students will examine trends and operations of cyberattacks, threats, and vulnerabilities. Students will develop security policies to mitigate risks. The skills obtained in this course prepare students for additional study toward industry certification. Cybersecurity Capstone will serve as a culminating course in this field of study.

Practicum in Information Technology:

Cybersecurity

TEDS: 13028000

KISD: 82367

Credit: 2

Grade: 12

Prerequisite: Cybersecurity Capstone and Digital Forensics

Practicum in Information Technology: Cybersecurity is a capstone course intended to provide students with the opportunity to apply the skills and knowledge learned in previous Cybersecurity courses toward the completion of an in-depth project with fellow team members. Whether seeking a career in the growing field of cybersecurity or learning to defend their own personal data or a company's data, students in this course establish an ethical code of conduct while learning to defend data in today's complex cyberworld. Students who have progressed to this level in the program of study take on more responsibilities for producing independent work and managing processes involved in the planning, designing, refinement, and production of cybersecurity applications. Upon completion of the practicum, proficient students will be prepared for postsecondary study and career advancement in the field of cybersecurity.

Computer Science I Honors

TEDS: 03580200


KISD: 82301

Credit: 1

Grade: 9-12

Prerequisite: Complete or concurrent enrollment in Algebra I

Computer Science I will foster students' creativity and innovation by presenting opportunities to design, implement, and present meaningful programs through a variety of media. Students will collaborate with one another, their instructor, and various electronic communities to solve the problems presented throughout the course. Through data analysis, students will identify task requirements, plan search strategies, and use computer science concepts to access, analyze, and evaluate information needed to solve problems. By using computer science knowledge and skills that support the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create solutions, and evaluate the results. The purpose of this course is to continue on to AP Computer Science and prepare for the AP exam. This course may count as a **LOTE** credit when taken in combination with another approved computer programming language course.



This Photo by Unknown Author is licensed under [CC BY-ND](https://creativecommons.org/licenses/by-nd/4.0/)

AP Computer Science

TEDS: A3580110, A3580120

Credit: 2

Grade: 10-12

Prerequisite: Computer Science I Honors

AP Computer Science A is equivalent to a first-semester, college-level course in computer science and is a continuation of Computer Science I. The course introduces students to computer science with fundamental topics that include problem solving, design strategies and methodologies, organization of data (data structures), approaches to processing data (algorithms), analysis of potential solutions, and the ethical and social implications of computing. The course emphasizes both object-oriented and imperative problem solving and design using 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 A course curriculum is compatible with many CS1 courses in colleges and universities. This course will strengthen the skills developed in Computer Science I. It involves more detailed programming using records, set, stacks, pointers, and recursion. **AP students prepare to take the Advanced Placement Exam in May for possible college credit.** This course counts as a **math** credit. This course may also count as a **LOTE** credit when taken in combination with another approved computer programming language course. Students earn 2 credits for this course, but the course is taught in 1 class period.

AP

KISD: 82340



This Photo by Unknown Author is licensed under [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/)

Computer Science II and III

TEDS: 03580300, 03580350

Credit: 2

Grade: 11-12

Prerequisite: AP Computer Science

KISD: 82342

Computer Science II and III will foster students' creativity and innovation by presenting opportunities to design, implement, and present meaningful programs through a variety of media. Students will collaborate with one another, their instructor, and various electronic communities to solve the problems presented throughout the course. Through data analysis, students will identify task requirements, plan search strategies, and use computer science concepts to access, analyze, and evaluate information needed to solve problems. By using computer science knowledge and skills that support the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create solutions, and evaluate the results. Students will learn digital citizenship by researching current laws and regulations and by practicing integrity and respect. Students will gain an understanding of advanced computer science data structures through the study of technology operations, systems, and concepts. Students will get to choose their focus among video game design, mobile application development, and coding. This course may also count as a **LOTE** credit when taken in combination with another approved computer programming language course. This course receives AP weight in GPA calculation.

Practicum in Information Technology: Programming and Software Development

TEDS: 13028000

KISD: 82361

TEDS: 13028010

KISD: 82365

Credit: 2

Grade: 12

Prerequisite: Computer Science II and III

In this course, students will gain advanced knowledge and skills in the application, design, production, implementation, maintenance, evaluation, and assessment of products, services, and systems. Knowledge in the proper use of analytical skills and application of IT concepts and standards are essential to prepare students for success in a technology-driven society. Critical thinking, IT experience, and product development may be conducted in a classroom setting with an industry mentor, as an internship, as part of a capstone project, or as career preparation. Projects related to coding, video game design, or mobile application development will be included in the course.



Program of Study Course Sequence	9th Grade	10th Grade	11th Grade	12th Grade
Engineering	Introduction to Engineering Design (1 credit) <i>Prerequisite: Algebra I</i>	Engineering Science (PLTW: Principles of Engineering) (1 credit) <i>Prerequisite: Introduction to Engineering Design, Algebra I, and Biology</i>	Choose 2 credits from the following 5 courses: Aerospace Engineering (1 credit), Digital Electronics (1 credit), Civil Engineering (1 credit), Robotics I (1 credit), Scientific Research & Design: Introduction to Unmanned Aerial Vehicles (1 credit) <i>Prerequisite: Engineering Science, Algebra I, and Geometry</i>	Option 1: Practicum in Science, Technology, Engineering, and Math (2 credits) Option 2: Engineering Design and Problem Solving (PLTW: Engineering Design & Development) (1 credit) AND 1 credit from the following courses: Robotics II (1 credit), Computer Integrated Manufacturing (1 credit), Aerospace Engineering (1 credit), Digital Electronics (1 credit), Civil Engineering (1 credit) <i>Prerequisite: 3 credits in Engineering Program</i>

Certifications / Certificate Opportunities Based on Program of Study
Multiple Internship Opportunities
Career and Technical Student Organization (CTSO)
KCAL Robotics (Local Chapter) VEX, BEST, FIRST Robotics Competitions

Additional Course Information
Credits: Digital Electronics and Robotics II can be used as a math credit. Engineering Science and AP Physics C: E&M can be used as a science credit.
Fees: Career and Technical Student Organizations are co-curricular to the curriculum. Although membership is not required, it is highly encouraged for students to join their local CTSO chapter. Fees may apply.
Location: Courses shaded in gray will be taught at the Keller Center for Advanced Learning .

Introduction to Engineering Design

TEDS: N1303742

KISD: 82641

Credit: 1

Grade: 9-10

Prerequisite: Complete or concurrent enrollment in Algebra I

This is the foundation course in a series of Project Lead the Way pre-engineering courses designed to introduce the student to the field of engineering. Students will develop problem-solving skills, with emphasis placed upon the concept of developing 3-D models. The course will emphasize the design development process of a product and a model of the product is produced, analyzed, and evaluated, using a Computer Aided Design Systems. Various design applications will be explored with discussion of possible career opportunities. Students who pass the PLTW college-credit exam, given at the end of the course, can receive college credit at PLTW affiliated universities.

Engineering Science

(PLTW: Principles of Engineering)

TEDS: 13037500

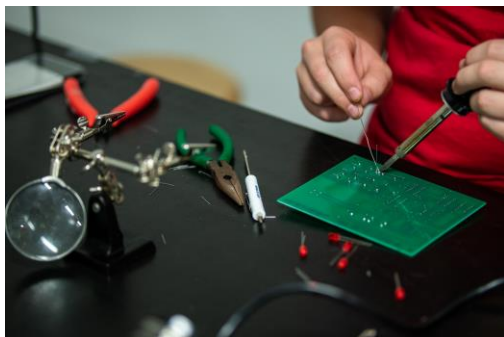
KISD: 82642

Credit: 1

Grade: 10-12

Recommended prerequisite: Introduction to Engineering Design, Algebra I, and Biology

This foundation course is designed to help students understand the field of engineering/engineering technology. Exploring various technology systems and manufacturing process help students learn how engineers and technicians use math, science and technology in an engineering problem solving process to benefit people. The course also includes concerns about social and political consequences of technological change. Students who pass the PLTW college-credit exam, given at the end of the course, can receive college credit at PLTW affiliated universities. This course counts as a science credit.



Aerospace Engineering

TEDS: N1303745

KISD: 82662

Credit: 1

Grade: 11-12

Recommended prerequisite: Engineering Science

This specialization PLTW course applies principles of aeronautics, flight, and engineering. The course will include experiences from diverse fields of aeronautics, aerospace engineering, and related areas of study. It will cover many areas including the following: history of flight; airfoil design, construction, and testing; rocket engine thrust; rocket trajectory; effects of gravity; navigation systems; glider design; intelligent vehicles; and remote sensing.

Digital Electronics

TEDS: 13037600

KISD: 82673

Credit: 1

Grade: 11-12

Recommended prerequisite: Engineering Science, Algebra I, and Geometry

This is a course in applied logic that encompasses the application of electronic circuits and devices. Computer simulation software is used to design and test digital circuitry prior to the actual construction of circuits and devices. This course counts for a math credit. *This course receives Honors weight for the class of 2025 and beyond.*

Civil Engineering and Architecture

TEDS: N1303747

KISD: 82644

Credit: 1

Grade: 11-12

Recommended prerequisite: Engineering Science, Algebra I, and Geometry

In this course, students will learn important aspects of building and site design, and then they apply what they know to design a building. They will use math, science, and standard engineering practices to design both residential and commercial projects and document their work using 3-D architectural design software.

Robotics I

TEDS: 13037000

KISD: 82651

Credit: 1

Grade: 11-12

Recommended prerequisite: Engineering Science

Students enrolled in this course will demonstrate knowledge and skills necessary for the robotic and automation industry. Through implementation of the design process, students will transfer advanced academic skills to component designs in a project-based environment. Students will build prototypes or use simulation software to test their designs. Additionally, students explore career opportunities, employer expectations, and educational needs in the robotic and automation industry.



Scientific Research & Design: Introduction to Unmanned Aerial Vehicles

TEDS: 13037200

KISD: 82733

Credit: 1

Grade: 10-12

Recommended prerequisite: Engineering Science

The Introduction to Unmanned Aerial Vehicle course is designed to prepare students for entry-level employment or continuing education in piloting UAV operations. The course is designed to instruct students in UAV flight navigation, industry law and regulations, and safety regulations. Students are also exposed to mission planning procedures, environmental factors, and human factors involved in the UAV industry.

Practicum in Science, Technology, Engineering, and Math

TEDS: 13037400

KISD Trailer Section: 82370

Credit: 2

KISD Solar Car Section: 82371

Grade: 12

KISD Internship Section: 82372

Recommended prerequisite: 3 credits in the engineering program

The practicum course is a paid or unpaid capstone experience for students participating in a coherent sequence of career and technical education courses in the Engineering cluster. This course is a unique practicum that provides occupationally specific opportunities for students to participate in a learning experience that combines classroom instruction with actual business and industry career experiences. There are 3 different types of practicum sections: solar car, trailer, and internship. In solar car, students will design and build a solar car to race at competitions. For trailer, students take the engineering mobile classroom to elementary schools to teach students about engineering. And students are placed in the internship practicum if they earn an internship at any of the partnering engineering companies in the area. Practicum in STEM integrates academic and career and technical education; provides more interdisciplinary instruction; and supports strong partnerships among schools, businesses, and community institutions with the goal of preparing students with a variety of skills in a fast-changing workplace.

Engineering Design and Problem Solving (PLTW: Engineering Design & Development)

TEDS: 13037300

KISD: 83643

Credit: 1

Grade: 11-12

Recommended prerequisite: Algebra I, Geometry, and 3 credits in the engineering program

This course is the senior capstone course of the Project Lead the Way pre-engineering sequence. Students will work in teams to research, design, and construct a solution to an open-ended engineering problem. Students apply principles developed in the four preceding courses and are guided by an engineering mentor. Students will present progress reports, submit a final written report, and present their solutions to a panel of outside reviewers at the end of the course. This course receives counts as a science credit. *This course receives Honors weight for the class of 2025 and beyond.*

Robotics II

TEDS: 13037050

KISD: 82652

Credit: 1

Grade: 12

Recommended prerequisite: Robotics I

In Robotics II, students will explore artificial intelligence and programming in the robotic and automation industry. Through implementation of the design process, students will transfer academic skills to component designs in a project-based environment. Students will build prototypes and use software to test their designs. This course counts as a math credit.



Computer Integrated Manufacturing

TEDS: N1303748

KISD: 82645

Credit: 1

Grade: 11-12

Recommended prerequisite: Engineering Science

Manufactured items are part of everyday life, and this course illuminates the opportunities related to understanding manufacturing. In this Project Lead the Way course, students discover and explore manufacturing processes, product design, robotics, and automation, and then they apply what they have learned to design solutions for real-world manufacturing problems.

