

Science, Technology, Engineering & Mathematics

Course Descriptions

Introduction Engineering Design PLTW Engineering Program Course

TEA # N1303742

Course # 0911

Grade Placement: 9-12

Credit: 1

In this course, students dig deep into the engineering design process, applying math, science, and engineering standards to hands-on projects. They work both individually and in teams to design solutions to a variety of problems using 3D modeling software and document their work in an engineering notebook.

AC/DC Electronics

TEA # 13036800

Course # 0918P

Grade Placement: 10-12

Credit: 1

AC/DC Electronics focuses on the basic electricity principles of alternating current/direct current (AC/DC) circuits. Students will demonstrate knowledge and applications of circuits, electronic measurement, and electronic implementation. Through use of the design process, students will transfer academic skills to component designs in a project-based environment. Students will use a variety of computer hardware and software applications to complete assignments and projects. Additionally, students will explore career opportunities, employer expectations, and educational needs in the electronics industry.

Note: This course has a competition requirement.

Career Preparation I

TEA # 12701300

Course # 0531 & 2531

Grade Placement: 11-12

Credit: 2

Career Preparation I provides opportunities for students to participate in a work-based learning experience that combines classroom instruction with business and industry employment experiences. The goal is to prepare students with a variety of skills for a changing workplace. Career preparation is relevant and rigorous, supports student attainment of academic standards, and effectively prepares students for college and career success.

Note: This course requires a Course Interest Form to be submitted and requires students to have either paid or unpaid employment. The employment site is typically selected by each individual student to ensure it correlates to their specific career interest area. Most employment sites are located out in our surrounding community.

Civil Engineering and Architecture

TEA # 13036800

Course # 0918P

Grade Placement: 10-12

Credit: 1

In this course, students learn important aspects of building and site design and development, applying math, science, and standard engineering practices to design both residential and commercial projects. Students will document designs using 3D architecture design software.

Computer Programming I

TEA # 13027600

Course # Phasing Out

Grade Placement: 10-12**Credit: 1**

In Computer Programming I, students will acquire knowledge of structured programming techniques and concepts appropriate to developing executable programs and creating appropriate documentation. Students will analyze the social responsibility of business and industry regarding the significant issues relating to the environment, ethics, health, safety, and diversity in society and in the workplace as related to computer programming. Students will apply technical skills to address business applications of emerging technologies.

Digital Electronics**TEA # 13037600****Course # 0913****Grade Placement: 10-12****Credit: 1**

From smart phones to appliances, digital circuits are all around us. This course provides a foundation for students who are interested in electrical engineering, electronics, or circuit design. Students study topics such as combinational and sequential logic and are exposed to circuit design tools used in industry including logic gates, integrated circuits, and programmable logic devices.

Note: This course can satisfy a math credit requirement for students on the Foundation High School Program. Students are encouraged to meet with their Academic Counselor to ensure they are following the appropriate math course sequence and can apply this course to their math graduation requirements.

Engineering Science**TEA # 13037500****Course # 0912****Grade Placement: 10-12****Credit: 1**

Prerequisite: Algebra I and Biology; and Chemistry, IPC, or Physics

Recommended Prerequisite: Geometry

Engineering Science is an engineering course designed to expose students to some of the major concepts and technologies that they will encounter in a postsecondary program of study in any engineering domain. Students will have an opportunity to investigate engineering and high-tech careers. In Engineering Science, students will employ science, technology, engineering, and mathematical concepts in the solution of real-world challenge situations. Students will develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges. Students will also learn how to document their work and communicate their solutions to their peers and members of the professional community.

Note: This course can satisfy a science credit requirement for students on the Foundation High School Program. Students are encouraged to meet with their Academic Counselor to ensure they are following the appropriate science course sequence and can apply this course to their science graduation requirements.

Fundamentals of Computer Science**TEA # 03580140****Course # 0444****Grade Placement: 9-12****Credit: 1**

Fundamentals of Computer Science is intended as a first course for those students just beginning the study of computer science. Students will learn about the computing tools that are used every day. Students will foster their creativity and innovation through opportunities to design, implement, and present solutions to real-world problems. Students will collaborate and use computer science concepts to access, analyze, and evaluate information needed to solve problems. Students will learn the problem-solving and reasoning skills that are the foundation of computer science. 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 the principles of computer science through the study of technology operations and concepts.

The six strands include creativity and innovation; communication and collaboration; research and information fluency; critical thinking; problem solving, and decision making; digital citizenship; and technology operations and concepts.

Note: *This course can satisfy a science credit requirement for students on the Foundation High School Program. Students are encouraged to meet with their Academic Counselor to ensure they are following the appropriate science course sequence and can apply this course to their science graduation requirements.*

Robotics I

TEA # 13037000

Course # 0930P

Grade Placement: 10-12

Credit: 1

In Robotics I, students will transfer academic skills to component designs in a project-based environment through implementation of the design process. Students will build prototypes or use simulation software to test their designs. Additionally, students will explore career opportunities, employer expectations, and educational needs in the robotic and automation industry.

Note: *This course has a competition requirement.*

Scientific Research & Design

TEA # 13037200

Course # 0446

Grade Placement: 11–12

Credit: 1

Prerequisite: **Biology, Chemistry, Integrated Physics, and Chemistry (IPC), or Physics**

Scientific Research and Design has the components of any rigorous scientific or engineering program of study from the problem identification, investigation design, data collection, data analysis, formulation, and presentation of the conclusions. These components are integrated with the career and technical education emphasis of helping students gain entry-level employment in high-skill, high-wage jobs and/or continue their education. Students must meet the 40% laboratory and fieldwork requirement.

Note: *This course can satisfy a science credit requirement for students on the Foundation High School Program. Students are encouraged to meet with their Academic Counselor to ensure they are following the appropriate course sequence and can apply this course to their science graduation requirements.*

Scientific Research & Design Honors

TEA # 13037200

Course # 0441

Grade Placement: 11–12

Credit: 1

Prerequisite: **Biology, Chemistry, Integrated Physics, and Chemistry (IPC), or Physics**

Scientific Research and Design has the components of any rigorous scientific or engineering program of study from the problem identification, investigation design, data collection, data analysis, formulation, and presentation of the conclusions. These components are integrated with the career and technical education emphasis of helping students gain entry-level employment in high-skill, high-wage jobs and/or continue their education. Students must meet the 40% laboratory and fieldwork requirement. This course is similar to Scientific Research and Design; however, it incorporates higher-order thinking skills through assessment and synthesis of the presented knowledge combined with exposure to clinical analysis and lab work.

Note: *This course can satisfy a science credit requirement for students on the Foundation High School Program. Students are encouraged to meet with their Academic Counselor to ensure they are following the appropriate course sequence and can apply this course to their science graduation requirements.*

Solid State Electronics

TEA # 13036900

Course # 0919P

Grade Placement: 10-12

Credit: 1

In Solid State Electronics, students will demonstrate knowledge and applications of advanced circuits, electrical measurement, and electrical implementation used in the electronics and computer industries. Students will transfer advanced academic skills to apply engineering principles and technical skills to troubleshoot, repair, and

modify electronic components, equipment, and power electronic systems in a project-based environment. Additionally, students will explore career opportunities, employer expectations, and educational needs in the electronics industry. Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.

Note: This course has a competition requirement.

STC Architectural & Engineering Design Technology Program

Course # 0797 & 2797

Grade Placement: 11-12

Credits: 1 per course

Prerequisite: Meet South Texas College acceptance criteria

The purpose of this program is to prepare the students for employment in architectural, visual, and civil engineering technology industries. The student will be required to have an understanding of, but not limited to, the following areas: principles of drafting, architectural drafting, civil drafting, layout and design, application of the latest drawing software programs, current knowledge of building standards and codes, and construction materials and specifications. Refer to the following STC website for a listing of the actual courses in this certificate program: <https://bt.southtexascollege.edu/aedt/>

Note: Since the courses under this program are taught by college instructors at the South Texas College Technology Campus, bus transportation will be provided. When courses are offered 1st block, the bus will leave from the high school at 7:30 a.m. therefore, students must be able to commit to arriving early at school in order to board the bus. Personal transportation is allowed pending pre-approval and will be contingent upon obtaining a parking permit from the student's home campus and STC. Course offerings are dependent on the availability of STC staff, and specific courses will only be offered if the minimum enrollment requirements are met. See your counselor for more detailed information regarding this off-campus program.

STC Dual Enrollment Engineering Academy (DEEA)

Course # 1006 & 2006

Grade Placement: 11-12

Credit: 1 per course

Prerequisite: Meet South Texas College acceptance criteria; 2-Year Commitment

This South Texas College (STC) Dual Enrollment Engineering Academy (DEEA) is a two year-round dual enrollment program developed for high school juniors and seniors who are seriously interested in pursuing a career in engineering. The purpose of this academy is to increase the number of rural area students committed to careers and service in Manufacturing, Electrical, Industrial Engineering, and others. This academy is designed to encourage area high school students into the engineering profession by providing college course-work and engineering related opportunities that will motivate, educate, and prepare students for higher education in the field of math and science while completing an Associate of Science (AS) degree in Engineering by the end of their high school senior year. With the support of the local engineers, the Dual Enrollment Engineering Academy will promote and participate in efforts that will reinforce the schools' and communities' commitment to prepare students for careers in Engineering. Contact your school Counselor for more information on how to enroll into this program.

Note: This course has an application process in place.