



Achievement. Integrity. Perseverance. Critical Thinking. Leadership and Community.

2018-2019 Course Guide

Core Academics and Required Electives

Sci High students enroll in core academic subjects for all four years. Below is the typical course progression in each of the core subject areas. Courses marked with an asterisk (*) are described in more detail on the following pages. Students pursuing a JumpStart Career Diploma should make an individual plan with their Academic Guidance Advisor.

What's your next course in English, Math, Social Studies, and Science?

	9 th Grade	10 th Grade	11 th Grade	12 th Grade
ENGLISH	English I	English II and Technical Writing OR English II Pre-AP* and Technical Writing Honors	English III OR English III AP* (AP Language and Composition)	English IV OR English IV AP* (AP Literature)

MATH	Algebra I	Geometry	Algebra II	Precalculus*	AP Calculus*
				Probability and Statistics*	

SCIENCE	Physical Science	Chemistry	Biology	Science Elective* (See listing on following pages)
---------	------------------	-----------	---------	--

SOCIAL STUDIES	World Geography	World History OR AP World History*	US History OR AP US History*	Civics OR AP Government*
----------------	-----------------	--	------------------------------------	--------------------------------

Foreign Language: All students seeking the TOPS University Diploma are required to complete two years of foreign language.

LANGUAGES	Spanish I	Spanish II	Advanced Spanish*
-----------	-----------	------------	-------------------

All students seeking the TOPS University Diploma are also required to complete the following general education electives:

- Health – ½ year
- PE – 1 ½ years
- Fine Art Survey – 1 year

Advanced Courses and Academic Electives

English Advanced Coursework

English II Pre-AP

Pre-AP is a class that offers integrated reading and writing instruction to increase independence in anticipation of the level of rigor required for AP Language and Literature. Students engage with a wide variety of high-quality texts—fiction, nonfiction, poetry, drama, visuals, and film—and learn techniques and strategies for understanding them. (Prerequisite: English I, summer reading)

English III AP (AP English Language and Composition)

The AP English Language and Composition course aligns to an introductory college-level rhetoric and writing curriculum, which requires students to develop evidence-based analytic and argumentative essays and analyze rhetorical elements and their effects in non-fiction texts. (Prerequisite: English II or English II Pre-AP, summer reading)

English IV AP (AP English Literature and Composition)

The AP English Literature and Composition course aligns to an introductory college-level literary analysis course. The course engages students in the close reading and critical analysis of literature to deepen their understanding of the ways in which writers use language to build meaning in their work. (Prerequisite: English III or English III AP, summer reading)

Math Electives and Advanced Courses

Probability and Statistics

Probability and statistics is an introductory statistics course. Major topics include gathering and interpreting data – exploring relationships between variables – randomness and probability – experimental design – probability and sampling distribution models – hypothesis testing and comparing two proportions. This is an excellent course for students who want to

understand how data is used to shape our understanding of the world. (Prerequisite: Algebra I and Geometry)

Precalculus

The purpose of this course is to prepare students to take calculus – either during their senior year of high-school or their freshman year of college. To that end we will begin with an intensive review of the material covered in Algebra II. We will then study aspects of variation – function design – exponential and logarithmic expressions and functions – trigonometry – matrices and linear programming. (Prerequisite: Algebra II)

AP Calculus A/B

This course follows the College Board AP Calculus (AB) curriculum. Major topics include limits and continuity – differentiation – optimization – related rates – anti-differentiation – the Fundamental Theorem of Calculus – volumes by revolution – simple differential equations and slope fields. The subject will be explored numerically – graphically and algebraically and cover trigonometric – logarithmic and exponential functions as well as algebraic functions. (Prerequisite: Precalculus)

Science Electives and Advanced Courses

Principles of Biomedical Science

In the introductory course of the PLTW Biomedical Science program, students explore concepts of biology and medicine to determine factors that led to the death of a fictional person. While investigating the case, students examine autopsy reports, investigate medical history, and explore medical treatments that might have prolonged the person's life. The activities and projects introduce students to human physiology, basic biology, medicine, and research processes while allowing them to design their own experiments to solve problems. (Prerequisite: Algebra I enrollment or higher)

Medical Interventions

Students follow the life of a fictitious family as they investigate how to prevent, diagnose, and treat disease. Students explore how to detect and fight infection; screen and evaluate the code in human DNA; evaluate cancer treatment options; and prevail when the organs of the body begin to fail. Through real-world cases, students are exposed to a range of interventions related to immunology, surgery, genetics, pharmacology, medical devices, and diagnostics. (Prerequisite: Principles of Biomedical Science)

Human Body Systems / Anatomy and Physiology

A challenging and comprehensive course in the composition and workings of the human body. Ideal for anyone fascinated by health and how our bodies work, whether it's from the perspective of a future researcher or health care worker. (Prerequisite: Medical Interventions or Biology)

Physics

In this introductory physics course, students will learn about the science underlying both every day experience and work in the fields of engineering and technology. Topics will include force, motion, electricity, and other foundational physics topics.

Environmental Science

This course surveys key topic areas including the application of scientific process to environmental analysis; ecology; energy flow; and ecological structures. Students explore actual case studies, unit-long research activities, learning that political and private decisions about the environment require accurate application of scientific processes, including proper data collection and responsible conclusions.

AP Environmental Science

AP Environmental Science is a college-level course that provides students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze

environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving and/or preventing them. (Prerequisite: Biology)

AP Biology

AP Biology is an introductory college-level biology course. Students will improve their understanding of biology through inquiry-based investigations as they explore the following topics: evolution, cellular processes — energy and communication, genetics, information transfer, ecology, and interactions. A minimum of 25% of class time is dedicated to labs, including growing plants to create class Punnett Squares, genetic manipulation of bacteria, and investigating animal behaviors through fruit flies. (Prerequisite: Biology)

AP Chemistry

The AP Chemistry course is an introductory college-level chemistry course. Students will improve their understanding of chemistry through inquiry-based investigations, as they explore topics such as: atomic structure, intermolecular forces and bonding, chemical reactions, kinetics, thermodynamics, and equilibrium. A minimum of 25% of class time is dedicated to labs such as making aspirin, creating a rainbow of chemical reactions, and the chemistry behind hand-warmers. (Prerequisite: Chemistry)

Social Studies

AP World History

A college-level course in World History requiring intensive homework including on weekends and holidays. Focus is on reading primary documents, writing historical essays, and discussing deep historical questions. The course covers 12,000 years of history on every continent. Maps, food tastings, and Socratic seminars included.

AP US History

The AP U.S. History course is a college level history course that focuses on developing students' understanding of American history from approximately 1491 to the present. The course has students investigate the content of U.S. history for significant events, individuals, developments, and processes in nine historical periods, and develop and use the same thinking skills and methods employed by historians when they study the past.

AP Government

AP Government is a college level course can be taken as an elective after Civics or instead of it, for graduation. Students can expect complicated reading texts which they must learn and analyze course material. Students will learn about the day to day operations of the American government, the influence of the media, interest groups, and political parties on the governing process, and the history and modern application of civil liberties and civil rights (and of course, how to vote).

Psychology

Do you know why fast food restaurants are always painted red? Do you know why you get so angry sometimes you can't think? Psychology is a course that will teach you about how the mind works, how personalities develop and how society uses psychology from everything to designing restaurants to writing music. You can use this information to understand your life and the lives of the people around you. Psychology will be a project-based elective with class readings, discussion, and film.

Foreign Language

Advanced Spanish

Advanced Spanish is a course designed for heritage speakers or longtime students of Spanish. The course is conducted largely in Spanish and consists of intensive study of the language and literature of the Spanish speaking world. (Prerequisite: Administrator approval)

Career and Technical Education (CTE) Electives

Advanced Manufacturing

Theatre Design and Technology (Makerspace)

Theatre Design and Technology is not a drama class. It's a class in making things - both physical and virtual. It a hands-on, project-based course where students try out a wide variety of creative and practical pursuits, including carpentry, 3D modeling, web-design, and robotics. Priority given to 9th and 10th grade students.

Introduction to Engineering

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 an engineering

notebook to document their work. (Prerequisite: Algebra I enrollment or higher)

Principles of Engineering

Through problems that engage and challenge, students explore a broad range of engineering topics, including mechanisms, the strength of structures and materials, and robotics/automation. Students develop skills in problem solving, research, and design while learning strategies for design process documentation, collaboration, and presentation. Students will also have the opportunity to investigate engineering & high-tech careers. (Prerequisite: Introduction to Engineering)

ACE 1 and ACE 2 (Pre-Apprenticeship 1 & 2)

Students collaborate with mentors through the Architecture, Construction, and Engineering Mentorship program on a project for their local

community. (Prerequisite: Principles of Engineering)

Introduction to Programming (Robotics)

In this course, students will learn the fundamentals of building & programming multiple robots through the design process and hands-on activities. During this process, they will learn key STEM principles and robotics concepts. At the culmination of this class, they will compete head-to-head against their peers in the classroom, and have the opportunity to participate in local competitions. (Prerequisite: Principles of Engineering, Fundamentals of JavaScript, or Makerspace)

Engineering Design (Inventor)

3D modeling intensive course where students use professional software to tackle real-world design problems. Culminates in an industry-based certification in Autodesk Inventor. (Prerequisite: Introduction to Engineering or Makerspace)

Construction Pre-Apprenticeship

Pre-Apprenticeship Program is aimed at preparing students for a high-earning career in the fast-paced construction industry. The course is an introduction to the construction industry and other skilled trades. The class covers Math for the Trades and Carpentry Projects, all while learning work-site safety. Students receive OSHA 10 certification, Core, and Level 1 credentials. (Prerequisite: Makerspace or permission of the CTE Coordinator)

Digital Media

Fundamentals of JavaScript

This course is a hands-on introduction to coding as a field as well as the highly marketable JavaScript language. Students have an opportunity to quickly earn industry-recognized web developer credentials. (Prerequisite: Sophomore status)

AP Computer Science

Using Python as a primary tool, students explore and become inspired by career paths that utilize computing, discover tools that foster creativity and collaboration, and use what they've learned

to tackle challenges like app development and simulation. This course gives students the opportunity to take the AP CSP exam for college credit. (Prerequisite: Introduction to Computer Science or Fundamentals of Javascript)

Media Art I

Media Art I introduces students to video capture and editing techniques, including an opportunity to earn an industry based credential in Adobe PremierPro.

Media Art II

Media Art II is a course where students master advanced techniques in video and audio capture and editing. (Prerequisite: Digital Photography)

Digital Photography

This course is designed to give students an understanding of how to apply Adobe Photoshop to perform many different image-processing techniques used for graphic design, digital photography, web design, digital video editing, and creating animations. Through projects, students will learn how to use several tools for selecting parts of images, retouching, layers, special filters, digital photography scanning techniques, and animation. Culminates in industry-based credential in Adobe Photoshop.

Health Sciences

Medical Terminology

An introduction to medical terminology through the lens of nursing practices. Includes hands-on training in skills essential to nursing.

Nursing Assistant

Through this hands-on course, students will become Certified Nursing Assistants. The course includes lectures in patient care, lab experiences, and extensive field experiences in a health care setting. Participating students must meet age and background check requirements to participate. (Prerequisite: Medical Terminology and Biology)