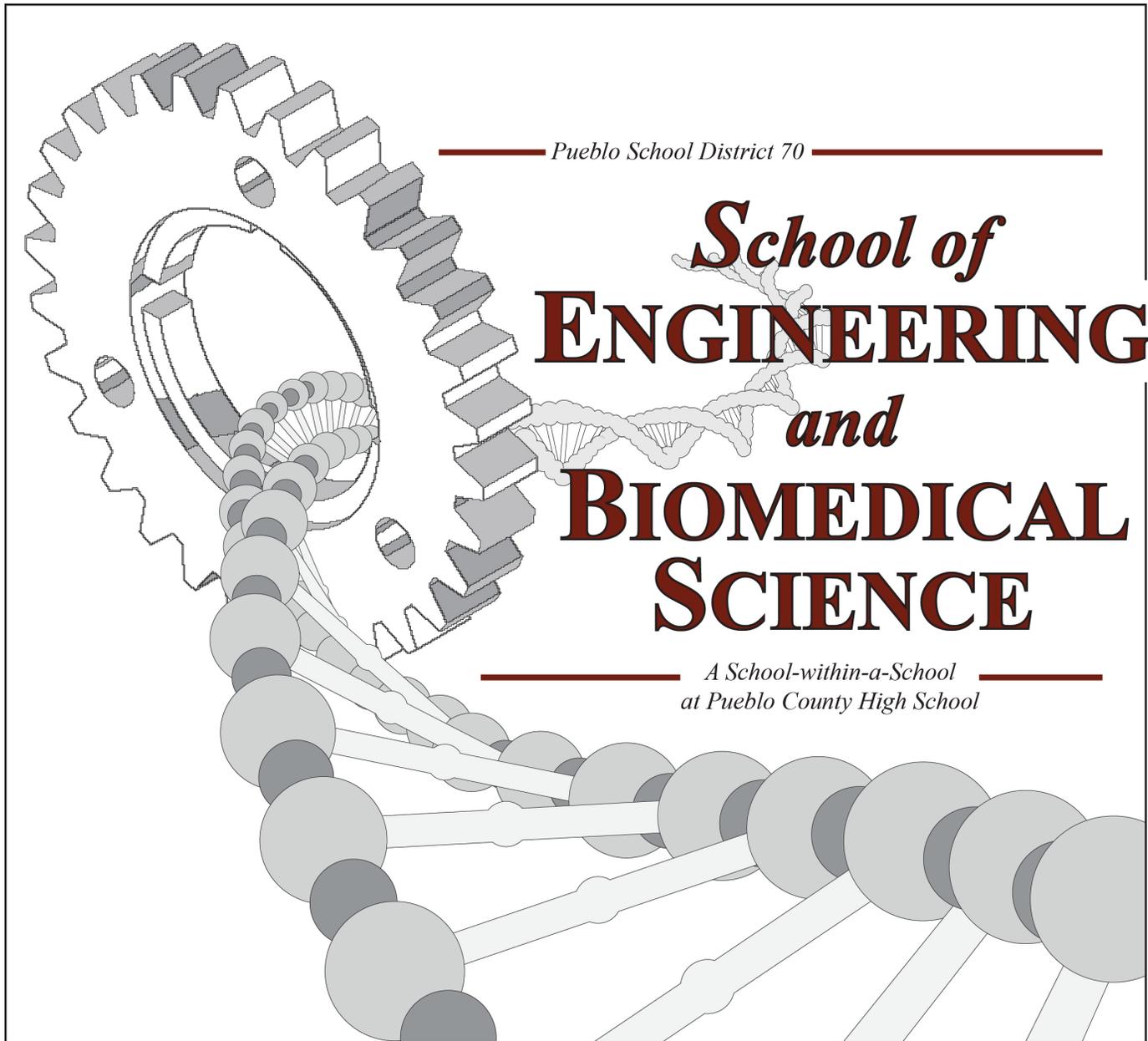


School of Engineering and Biomedical Science
A School-within-a-School at Pueblo County High School
2019 - 2020 Course Guide

February 23, 2019



A Different Atmosphere...

...A Different Attitude

Challenging • Motivating • Different • Engaging • Rewarding



SEBS

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School of Engineering and Biomedical Science

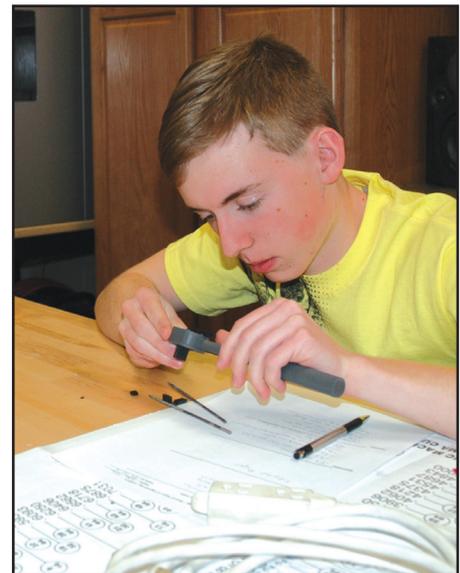
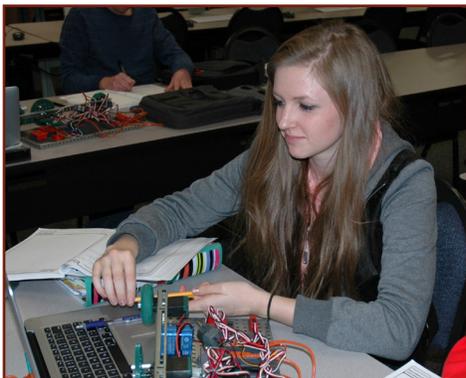
The School of Engineering and Biomedical Science (SEBS) offers its students a comprehensive four-year plan of coursework to prepare them for success in the biomedical science, engineering, and/or computer science fields. Each career academy is a multi-year course of study designed for the movement of students from foundational understanding and skills to advanced and complex application of knowledge during their senior year.

The design of the career academies maximizes student learning and preparedness through an integrated, rigorous, and coordinated curriculum. More traditional courses, like language arts and social studies, are integrated within the career pathway programs in a way that breaks down artificial barriers between disciplines and demonstrates the real-world connections between them. The knowledge and skills gained by students in one course is built upon, expanded and deepened in the courses that follow.

Pathway courses include Project Lead the Way (PLTW) which is a nationally recognized curriculum designed by educators, engineers, computer scientists, and biomedical professionals. The specialized courses for the career pathways, coupled with the hands-on, project based integration of “traditional” courses, has earned the school numerous excellent ratings from the Colorado Department of Education as well as recognition as one of America’s Top 100 High Schools, scoring among the top 5% - by the US News and World Report.

Enrollment in the SEBS offers students an array of advantages, from career readiness and hands-on experience to college preparatory–level classes, labs, and creative exercises. Students attending the School of Engineering and Biomedical Science are set up to succeed in the classroom and in life.

The school within a school is housed at Pueblo County High School. This arrangement allows SEBS students a greater range of high school experiences and elective course choices while maintaining a strict educational philosophy, rigorous curriculum and small school feel.

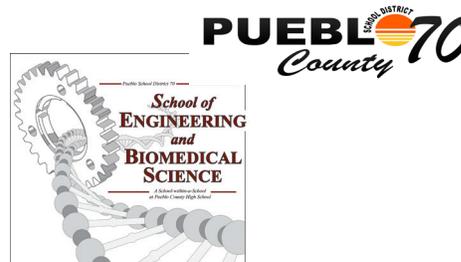


One purpose of this guide is to give students the opportunity to make educated decisions about classes they wish to take. Students should keep in mind their personal goal for their own education and that it is important to be successful in all courses.

Freshmen and sophomore schedules are designed to ensure that district graduation requirements are met early. This allows junior and senior students more flexibility and opportunity to select courses that will better prepare them for their specific college major and areas of interest.

Successful graduation from any District 70 high school requires twenty-five (25) total credits. These credits must satisfy the following criteria:

- Communication Arts / English - 4 credits
- Mathematics - 3 credits (minimum Algebra 2 required)
- Science - 3 credits (Biology required)
- Social Studies - 3 credits (Amer. Gov. & Economics required)
- Physical Education - 1.5 credits
- Health - 0.5 credit
- Technology and Information Literacy - 1.0 credit
- Electives - 9 credits
- Career and college readiness assessments as adopted by state graduation guidelines



Any student wishing to graduate with distinction from the School of Engineering and Biomedical Science (SEBS) must enroll in a minimum of one qualifying engineering, computer science, biomedical science or creative technology course each year for a minimum of three years, (including their senior year) and enroll in all of his/her courses through the SEBS program any time that course title is available. Additionally, students must maintain a cumulative grade point average of 2.50 (weighted) within the strand and other required academic courses (Honors Physical Science, Chemistry or SEBS Physics) outlined within each strand's coursework sequence. To be eligible for valedictorian or salutatorian of the School of Engineering and Biomedical Science, students must be enrolled in qualifying coursework for a minimum of three years.

The philosophy of the school dictates that all students be required to enroll in specific courses of study including advanced college preparatory courses offered through Pueblo County High School and/or SEBS or college courses located at local colleges. Many of the courses offered by SEBS prepare students for success on specific AP exams or other certifications that satisfy the career and college readiness component of district graduation requirements. Many courses within the SEBS curriculum are offered at a weighted grade point scale. This system, called quality points, is based on a total GPA of 4.0, but allows for increased GPA due to the rigor of the course content. In quality points classes, a grade of A earns 5.0 points, a B earns the student 4.0 points and a grade of C earns 3.0 points (grades below C are not calculated as quality points). Quality points courses are designated as a **QP class** in the course listings. Those accepted by the School of Engineering and Biomedical Science in the 2019/2020 school year include:

- Advanced Placement courses
- Advanced Placement Computer Science A
- Environmental Sustainability
- Biomedical Innovations
- Civil Engineering and Architecture
- Computer Science A
- Computer Science Principles
- Cybersecurity
- Digital Electronics
- Engineering Design and Development
- Honors Courses
- Human Body Systems
- Introduction to Engineering and Design
- Medical Interventions
- Principles of Biomedical Science
- Principles of Engineering
- Exercise Science-Sports Medicine

Biomedical Science Suggested Coursework Sequence (Class of 2023)

Grade 9
Math (Algebra 1 higher)
Principles of Biomedical Sciences (PBS)●○
Honors Physical Science*
English 1 or Honors English
US History
Elective
Elective
Grade 10
Math (Geometry or higher)
Human Body Systems (HBS)●○
Environmental Sustainability (ES)●○
English 2 or Honors English 2
World History
Biology (Honors Biology Suggested)
Elective
Grade 11
Math (Algebra 2 or higher)
Medical Interventions (MI)●○
Chemistry*
English 3 or AP English 3
American Government / Economics
Sports Medicine-CPT ○ or Post-Secondary Option (PSO)○ course or Elective
Post-Secondary Option (PSO)○ course or Elective
Grade 12
Math Elective suggested (Math Analysis or higher)
Biomedical Innovation (BI)●○
English 4, Technical English Career Prep, Accelerated English 4 or AP English 4
Post-Secondary Option (PSO)○ course or Elective
Post-Secondary Option (PSO)○ course or Elective
Sports Medicine- FNS○ and/or PES○ or Elective
Advanced Technology (Topics in Biomedical Science) or Elective

The rigorous and relevant biomedical science sequence allows students to investigate the roles of biomedical professionals as they study the concepts of human medicine, physiology, genetics, microbiology, sports medicine, and public health. Students engage in activities like investigating the death of a fictional person to learn content in the context of real-world cases. They examine the structures and interactions of human body systems and explore the prevention, diagnosis, and treatment of disease, all while working collaboratively to understand and design solutions to the most pressing health challenges of today and the future.

College courses offered through the School of Biomedical Sciences are transcribed courses through the University of Colorado at Colorado Springs (UCCS). Certifications are available through the National Academy of Sports Medicine.

SEBS Course College Equivalent (UCCS)	
Principles of Biomedical Science (PBS)	BIOL1011 (3 credits)
Human Body Systems (HBS)	BIOL1012 (3 credits)
Environmental Sustainability (ES)	ENGR 1510 (3 credits)
Medical Interventions (MI)	BIOL1013 (3 credits)
Biomedical Innovations (BI)	BIOL 2040 (3 credits)



- These courses are biomedical science strand qualifying courses. At least one is required each year to graduate with distinction from the School of Engineering and Biomedical Science.
- Successful completion of these courses may allow students eligibility for college credit through various universities or specific national certification.
- * These courses are required to graduate with distinction from the School of Engineering and Biomedical Science. Courses without a symbol are included to meet additional Pueblo District 70 graduation requirements for specific or elective course credit.

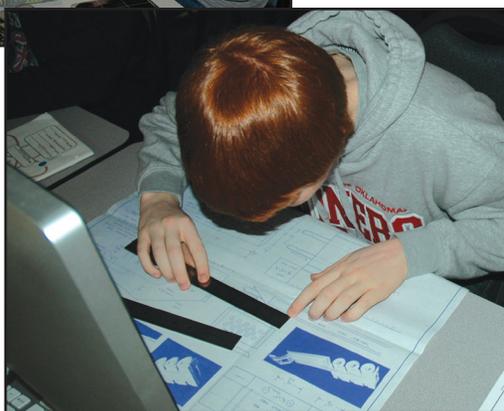
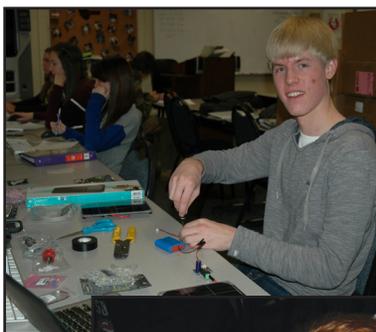
Computer Science Suggested Coursework Sequence (Class of 2023)

The Computer Science program of study engages students in computational thinking and prepares them to become part of a computationally aware and capable workforce. This program comprises introductory, foundation, and specialty courses.

The Computer Science strand of coursework is the most recent addition to the School of Engineering and Biomedical Science. The ninth grade course, Computer Science Applications, was implemented in the 2014/15 school year.

Each year, the next available course in the sequence will be implemented allowing the class of 2019 to complete four years of study in this career pathway before graduation. At the time of this publication, college credit articulation and future courses are still in development and, therefore, subject to change.

UCCS College Equivalency course credit as it becomes available.



Grade 9
Math (Algebra 1 or higher)
Computer Science Principles (CSP) ●○
Honors Physical Science *
English 1 or Honors English 1
US History
Science Technology Lab or Elective
Elective
Grade 10
Math (Geometry or higher)
Computer Science A (CSA) ●○
Digital Electronics*●○
English 2 or Honors English 2
World History
Biology
Elective
Grade 11
Math (Algebra 2 or higher)
Advanced Placement Computer Science A (APCSA)●○
Physics or Chemistry*
English 3 or AP English 3
American Government / Economics
Post-Secondary Option (PSO)○ course or Elective
Post-Secondary Option (PSO)○ course or Elective
Grade 12
Math Elective suggested (Math Analysis or higher)
Cybersecurity (SEC)●○
Advanced Technology (Topics in Computer Science) ●○
English 4, Technical English Career Prep, Accelerated English 4 or AP English 4
Post-Secondary Option (PSO)○ course or Elective
Post-Secondary Option (PSO) ○ course or Elective
Elective (Chemistry or Physics suggested)
Elective

- These courses are computer science strand qualifying courses. At least one is required each year to graduate with distinction from the School of Engineering and Biomedical Science.
- Successful completion of these courses may allow students eligibility for college credit through various universities, industry certification, and/or advance placement. Articulation of courses is currently in progress.
- * These courses are required to graduate with distinction from the School of Engineering and Biomedical Science. Courses without a symbol are included to meet additional Pueblo District 70 graduation requirements for specific or elective course credit.

Engineering Suggested Coursework Sequence (Class of 2023)

Grade 9
Math (Algebra 1 or higher)
Introduction to Engineering Design (IED) ●○
Honors Physical Science *
English 1 or Honors English 1
US History
Science Technology Lab or Elective
Elective

Grade 10
Math (Geometry or higher)
Principles of Engineering (POE) *●○
CADD 2 *○
English 2 or Honors English 2
World History
Biology (Honors Biology available)
Elective

Grade 11
Math (Algebra 2 or higher)
Civil Engineering and Architecture (CEA) ●○, Digital Electronics (DE)●○ or Advanced Technology (Topics in Engineering)●○
Physics*
English 3 or AP English 3
American Government / Economics
Post-Secondary Option (PSO)○ course or Elective
Post-Secondary Option (PSO)○ course or Elective

Grade 12
Math Elective suggested (Math Analysis or higher)
Civil Engineering and Architecture (CEA) ●○, Digital Electronics (DE)●○, Special Topics in Engineering●, CADD 4●, or Engineering Design and Development (EDD)●
English 4, Technical English Career Prep, Accelerated English 4 or AP English 4
Post-Secondary Option (PSO)○ course or Elective
Post-Secondary Option (PSO)○ course or Elective
Elective (Chemistry suggested)
Elective

In Engineering, students engage in open-ended problem solving, learn and apply the engineering design process, and use the same industry-leading technology and software as are used in the world's top companies. Students are immersed in design as they investigate topics such as mechatronics, forces, structures, aerodynamics, digital electronics and circuit design, manufacturing, and the environment, which gives them an opportunity to learn about different engineering disciplines before beginning post-secondary education and/or careers.

Most college courses offered through the School of Engineering are transcribed through the University of Colorado at Colorado Springs (UCCS). The course CADD 2 is eligible for college credit through Colorado State University - Pueblo (CSU-P).

SEBS Course College Equivalent (UCCS)	
Introduction to Engineering Design (IED)	ENGR 1503 (2 credits)
Principles of Engineering (POE)	ENGR 1502 (3 credits)
Civil Engineering and Architecture (CEA)	ENGR 1506 (3 credits)
Digital Electronics (DE)	ENGR 1411 (2 credits)
Engineering Design and Development (EDD)	ENGR 1508 (3 credits)



- These courses are engineering strand qualifying courses. At least one is required each year to graduate with distinction from the School of Engineering and Biomedical Science.
- Successful completion of these courses may allow students eligibility for college credit through various universities.
- * These courses are required to graduate with distinction from the School of Engineering and Biomedical Science. Courses without a symbol are included to meet additional Pueblo District 70 graduation requirements for specific or elective course credit.

Creative Technologies Suggested Coursework Sequence (Class of 2023)

Grade 9
Math (Algebra 1 higher)
Digital Media or Broadcast Video Production
Honors Physical Science*
English 1 or Honors English
US History
Elective
Elective
Grade 10
Math (Geometry or higher)
Digital Animation Technology or Broadcast Video Production 2
English 2 or Honors English 2
World History
Biology or Honors Biology
Elective
Elective
Grade 11
Math (Algebra 2 or higher)
Digital Animation Technology 2 or Digital Video Production 3 - Film Making
English 3 or AP English 3
American Government / Economics
Post-Secondary Option (PSO) ^o course or Elective
Post-Secondary Option (PSO) ^o course or Elective
Elective
Grade 12
Math Elective suggested (Math Analysis or higher)
Special Topics in Digital Media
English 4, Technical English Career Prep, Accelerated English 4 or AP English 4
Post-Secondary Option (PSO) ^o course or Elective
Post-Secondary Option (PSO) ^o course or Elective
Elective
Elective

The Creative Technology strand of study is for students interested in pursuing careers in the fields of multimedia arts, animation, graphic design, communications, as well as the entertainment and news fields.

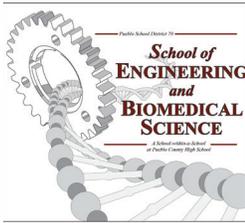
This strand branches off into two pathways: Digital Media or Audio/Visual Production. In each pathway participants will work individually and collaboratively using advanced technology, digital tools and commercial software applications to produce high quality, educational and commercial products.

Students enrolled in the Digital Media pathway will mesh design, art, and technology during their course of study to create real-life meaningful projects. They will also be introduced to, and gain a working knowledge of, the following the Adobe Creative Cloud programs: Photoshop, Illustrator, In-Design and the web design program Dreamweaver.

Students pursuing the Audio/Visual Production pathway will get an in-depth look at the areas of Television Production, Sports Broadcasting, Filmmaking, and Digital Broadcast Graphics. Students enrolled in this pathway will utilize Adobe's Premiere Pro, Photoshop, After Effects, and Animate. They will also work with state of the art equipment to produce weekly student news broadcasts and live streams of school and community events.

Upon completion of the program students will be prepared to seek entry level employment in graphic design and/or communications or pursue an advanced degree in these areas. Possible careers include: multimedia artist, desktop publisher, print technician, animator, graphic designer, web designer, photographer, cameraman, broadcast technician, announcer, and sound engineer.





SEBS Course Descriptions by Strand

To graduate with distinction from the School of Engineering and Biomedical Sciences, certain courses must be taken each year. These courses fall within the twenty-five (25) total credits required to graduate from any high school in the district. District 70 guidelines include:

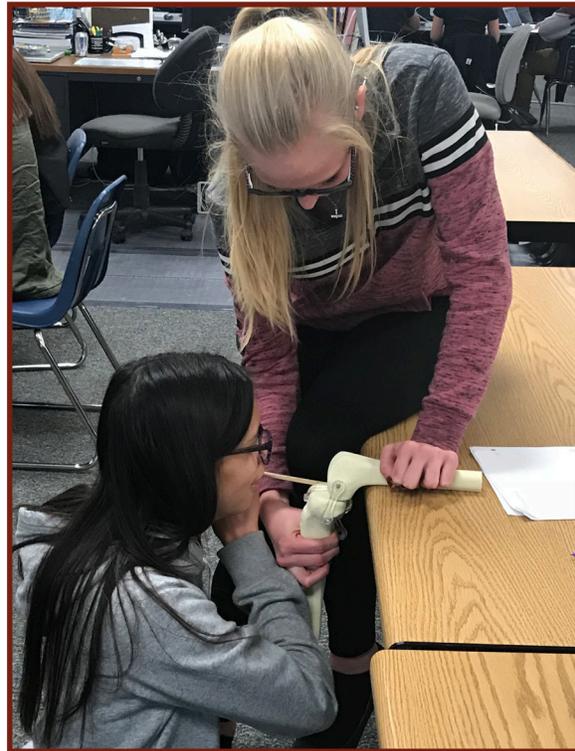
- Communication Arts / English - 4 credits
- Mathematics - 3 credits (minimum Algebra 2 required)
- Science - 3 credits (Biology required)
- Social Studies - 3 credits (American Government and Economics required)
- Physical Education - 1.5 credits
- Health - 0.5 credit
- Technology and Information Literacy - 1.0 credit



Biomedical Strand - Courses	10
Computer Science Strand - Courses	15
Creative Technology Courses	18
Engineering Strand - Courses	21
English Courses	26
Science Courses	28
Social Studies Courses	30
Electives and Physical Education Courses	31

Biomedical Strand

Grade 9
Math (Algebra 1 higher)
Principles of Biomedical Sciences (PBS)●○
Honors Physical Science*
English 1 or Honors English
US History
Elective
Elective
Grade 10
Math (Geometry or higher)
Human Body Systems (HBS)●○
Environmental Sustainability (ES)●○
English 2 or Honors English 2
World History
Biology (Honors Biology Suggested)
Elective
Grade 11
Math (Algebra 2 or higher)
Medical Interventions (MI)●○
Chemistry*
English 3 or AP English 3
American Government / Economics
Sports Medicine-CPT ○ or Post-Secondary Option (PSO)○ course or Elective
Post-Secondary Option (PSO)○ course or Elective
Grade 12
Math Elective suggested (Math Analysis or higher)
Biomedical Innovation (BI)●○
English 4, Technical English Career Prep, Accelerated English 4 or AP English 4
Post-Secondary Option (PSO)○ course or Elective
Post-Secondary Option (PSO)○ course or Elective
Sports Medicine- FNS○ and/or PES○ or Elective
Advanced Technology (Topics in Biomedical Science) or Elective



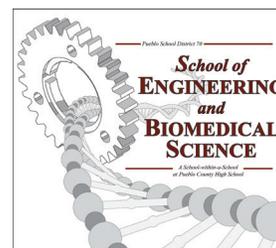
Each year, the first biomedical, computer science or engineering lab course requires a fee of \$20/year; for subsequent courses in the same year, the fee is waived (maximum \$20/year per student).

Principles of Biomedical Science (310285) QP Class

Prerequisites: None
Full Year, 1.0 Science Credit, Quality Points
Technology Credit

Fees: \$20/year*
Grade Level(s): 9 - 12

The Principles of the Biomedical Sciences (PBS) course is designed to introduce students to the study of the human body and human medicine. Key biological concepts, including homeostasis, metabolism, inheritance of traits, feedback systems, and defense against disease are embedded in the curriculum. Engineering principles, including the design process, feedback loops, and the relationship of structure to function are also incorporated. The foundation for the course is centered on an unexplained death. In order to determine how the victim died, students study five serious illnesses along with the biochemical concepts involved in that illness. Students investigate heart disease by examining the structure and function of the heart as well as that of cholesterol and its role in heart disease. Students learn about the mechanism, causes, and serious effects that diabetes can have on the body as a whole. Sick Cell Disease is used as a tool to gain an understanding of the inheritance of traits, and bacteria and viruses are investigated as the causative agents of infectious diseases. Medical interventions, including surgery, medication, technology, and life style choice are also explored. The course is designed to provide an overview of all the courses in the Biomedical Sciences™ program and to lay the scientific foundation necessary for student success in the subsequent courses.



Human Body Systems (303224) QP Class

Prerequisites: Principles of Biomedical Science Suggested concurrently: Environmental Sustainability

Full Year, 1.0 Science Credit, Quality Points

Fees: \$20/year*

Grade Level(s): 10 - 12

The Human Body Systems (HBS) course is designed to allow students to investigate the way in which body systems work together. Throughout the course of the year, students will investigate body systems and functions that all humans have in common, learn how the body receives and interprets stimuli from the outside world, investigate the mechanisms involved in obtaining, distributing, and/or processing the body's primary resources for energy and power. Students will experiment with the mechanisms for movement of the human body and the substances within the body, they will explore ways in which the human body protects itself from injury and disease and ultimately examine how all of the human body systems work together to maintain health and homeostasis.



Environmental Sustainability (310287) QP Class

Prerequisites: Introduction to Engineering Design or Principles of Biomedical Science

Full Year, 1.0 Science Credit, Quality Points

Fees: \$20/year*

Grade Level(s): 10, 11, 12

Environmental Sustainability (ES) is a rigorous, activity, project, and problem-based course in which students investigate and design solutions to solve real-world challenges related to human health such as clean and abundant drinking water, food supply issues, and renewable energy. Students gain knowledge concerning contamination causes and preventions, the science behind genetically modified organisms, and the use of biological engineering and biomanufacturing for the implementation of biofuels. Students apply their knowledge and skills as they use an engineering design process to design and then test solution that help solve these global health challenges.

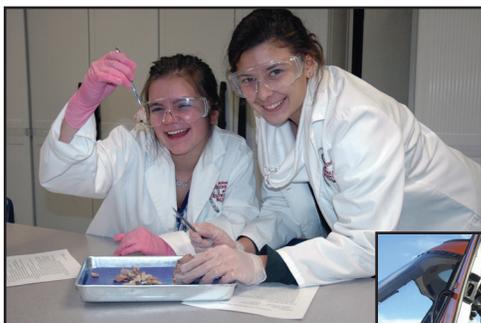


Medical Interventions (310289) QP Class

Prerequisites: Human Body Systems
Full Year, 1.0 Science Credit, Quality Points

Fees: \$20/year*
Grade Level(s): 11,12

In Medical Interventions (MI), 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 centered on 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.



Biomedical Innovations (310290) QP Class

Prerequisites: Medical Interventions or Concurrent
MI enrollment

Fees: \$20/year*

Full Year, 1.0 Science Credit, Quality Points

Grade Level(s): 11,12

In Biomedical Innovations (BI), 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 mentor(s) and/or advisor(s) from a university, hospital, research institution or the biomedical industry to meet some of the requirements for this course.

Exercise Science - Sports Medicine (303226)^{QP} Class

Prerequisite: Human Body Systems

Full Year, Science, Quality Points

Personal training has evolved into an exciting discipline that combines exercise, stretching, nutrition and more to set people on a path to better health. The incorporation of the industry-leading NASM-CPT program addresses this need by using the Optimum Performance Training model, which focuses on integrated solutions for every fitness level. The Sports Medicine- Certified Personal Trainer course is a Biomedical Strand elective emphasizing the application of previous skills and knowledge gained through PBS and HBS. This course will cover content and offer the option of obtaining National CPT Certification.

Fees: \$20/year*

Grade Level(s): 11,12



Advanced Technology (310120)

Prerequisites: Teacher approval

Full Year, 1.0 Elective Credit

Students build upon their knowledge through the creation of technology products related to biomedical science, creative technology, computer science, and/or engineering. They investigate and design products for specific audiences and purposes. Purposes may include scientific studies, conveyance of information, education, entertainment, and/or needs of society. Students enrolled in this course must be motivated to actively pursue further knowledge and skills in their particular area of interest.

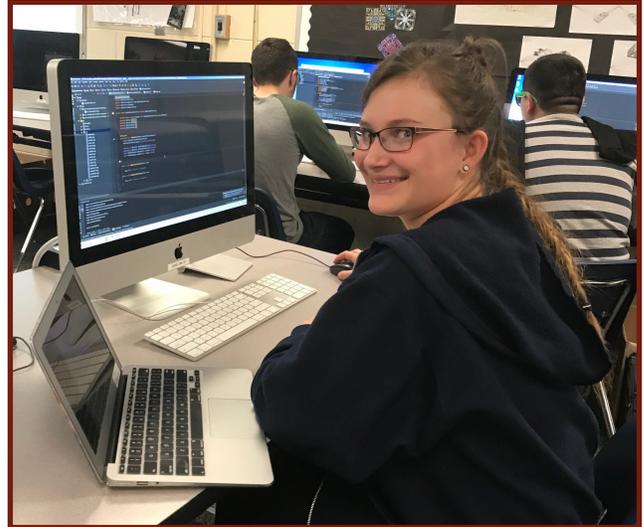
Fees: \$20

Grade Level(s): 11-12



Computer Science Strand

Grade 9
Math (Algebra 1 or higher)
Computer Science Principles (CSP) ●○
Honors Physical Science *
English 1 or Honors English 1
US History
Science Technology Lab or Elective
Elective
Grade 10
Math (Geometry or higher)
Computer Science A (CSA) ●○
Digital Electronics●○
English 2 or Honors English 2
World History
Biology
Elective
Grade 11
Math (Algebra 2 or higher)
Advanced Placement Computer Science A (APCSA)●○
Physics or Chemistry*
English 3 or AP English 3
American Government / Economics
Post-Secondary Option (PSO)○ course or Elective
Post-Secondary Option (PSO)○ course or Elective
Grade 12
Math Elective suggested (Math Analysis or higher)
Cybersecurity (SEC)●○
Advanced Technology (Topics in Computer Science)●○
English 4, Technical English Career Prep, Accelerated English 4 or AP English 4
Post-Secondary Option (PSO)○ course or Elective
Post-Secondary Option (PSO) ○ course or Elective
Elective (Chemistry or Physics suggested)
Elective



Computer Science Principles (310240) QP Class

Prerequisites: None

Fees: \$20/year*

Full Year, 1.0 Technology Credit, Quality Points

Grade Level(s): 9 - 12

Computer Science and Software Engineering (CSE) implements the College Board's CS Principles framework. Using Python® as a primary tool and incorporating multiple platforms and languages for computation, this course aims to develop computational thinking, generate excitement about career paths that utilize computing, and introduce professional tools that foster creativity and collaboration. CSP helps students develop programming expertise and gives them the tools to explore the workings of the Internet. Projects and problems include app development, visualization of data, cybersecurity, and simulation. The course curriculum is a College Board-approved implementation of AP CS Principles.

Computer Science A (310260) QP Class

Prerequisites: Computer Science Principles

Fees: \$20/year*

Suggested concurrently: Digital Electronics

Full Year, 1.0 Technology Credit, Quality Points

Grade Level(s): 10 - 12

Computer Science A, further develops the computational thinking skills learned in Computer Science Principles by providing an introduction to the Java™ programming language. Course basic object oriented concepts including attribute, state, classes, objects, and methods will be developed through writing Java code. Encapsulation, class creation, iteration, and debugging are some of the additional concepts that will be covered. CSA focuses on further developing computational thinking skills through the medium of Android™ App development for mobile platforms. The course utilizes industry-standard tools such as Android Studio to teach the basics of app development.

Advanced Placement Computer Science A (310261) QP Class

Prerequisites: B or better in Computer Science A and/or
Instructor approval

Fees: \$20/year*

Full Year, 1.0 Technology Credit, Quality Points

Grade Level(s): 11- 12

This year long course prepares students for the College Board Advanced Placement exam in Computer Science. Topics covered will include the Java programming language, searching, sorting, object oriented programming, program implementation, program analysis, and standard algorithms. Emphasis will be placed on problem solving and algorithm development. Students will further their knowledge of app development as they collaborate to create original solutions to problems of their own choosing by designing and implementing user interfaces and Web-based databases. Students in this class will also be responsible for learning to program the SEBS mascot robot, Nao, using the Robot C language.

Digital Electronics (310299) ^{QP Class}

Prerequisites: Algebra 1

Fees: \$20/year*

Full Year, 1.0 Science Credit, Quality Points

Grade Level(s): 10, 11, 12

Digital Electronics (DE) is a course in applied logic that encompasses the application of electronic circuits and devices. Students use computer simulation software to design and test digital circuitry prior to the actual construction of circuits and devices. Students use computer simulation to learn about the logic of electronics as they design, test, and actually construct circuits and devices.

Cybersecurity (318320) ^{QP Class}

Prerequisite: Computer Science A

Fees: \$20/year*

Full Year, Technology Credit, Quality Points

Grade Level(s): 11,12



Students enrolled in Cybersecurity (SEC) 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 SEC, students solve problems by understanding and closing these vulnerabilities. This course raises students' knowledge of and commitment to ethical computing behavior. 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.

Advanced Technology (310120)

Prerequisites: Teacher approval

Fees: \$20

Full Year, 1.0 Elective Credit

Grade Level(s): 11-12

Students build upon their knowledge through the creation of technology products related to biomedical science, creative technology, computer science, and/or engineering. They investigate and design products for specific audiences and purposes. Purposes may include scientific studies, conveyance of information, education, entertainment, and/or needs of society. Students enrolled in this course must be motivated to actively pursue further knowledge and skills in their particular area of interest.



Note: This strand is currently under development and subject to change in course content, course offering and college credit availability.

Creative Technologies Strand

Grade 9	Grade 10
Math (Algebra 1 higher)	Math (Geometry or higher)
Digital Media or Broadcast Video Production	Digital Animation Technology or Broadcast Video Production 2
Honors Physical Science*	English 2 or Honors English 2
English 1 or Honors English	World History
US History	Biology or Honors Biology
Elective	Elective
Elective	Elective
Grade 11	Grade 12
Math (Algebra 2 or higher)	Math Elective suggested (Math Analysis or higher)
Digital Animation Technology 2 or Digital Video Production 3 - Film Making	Special Topics in Digital Media
English 3, Technical English Career Prep or AP English 3	English 4, Technical English Career Prep, Accelerated English 4 or AP English 4
American Government / Economics	Post-Secondary Option (PSO) ^o course or Elective
Post-Secondary Option (PSO) ^o course or Elective	Post-Secondary Option (PSO) ^o course or Elective
Post-Secondary Option (PSO) ^o course or Elective	Elective
Elective	Elective



Each year, the creative technologies courses also fall under the \$20 per year lab fee assessment. These courses would also qualify under the maximum \$20/year per student.

Digital Media - (310291)

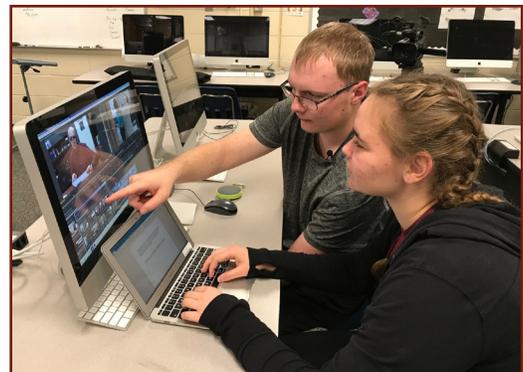
Prerequisites: Teacher approval
Full Year, 1.0 Technology Credit

Class Requirements: Students need a digital camera.

Students will develop artistic and creative skills using multimedia and digital media technologies. Students will explore and learn techniques in areas ranging from digital photography, beginning to advanced photo editing, desktop publishing, digital artwork, and webpage design. This course provides students with the knowledge and skills to be successful on the Adobe Creative Suite certification exams.

Fees: None

Grade Level(s): 9-12



Digital Animation Technology - (310255)

Prerequisites: Digital Media or Teacher approval

Fees: None

Full Year, 1.0 Technology Credit

Grade Level(s): 10-12

Class Requirements:

This course is designed for students interested in learning the fundamentals of computer animation while working with computer programs that are industry standard. First semester students will work with Adobe After-Effects to create 2-D text and narrative animations. Second semester students will explore the basics of 3-D animation and modeling utilizing the Autodesk programs Maya and 3-D Studio Max.

Digital Animation Technology 2 (Course Number Pending)

Prerequisites: Digital Animation Technology

Fees: \$20

Full Year, 1.0 Technology Credit

Grade Level(s): 11-12

This second level animation course will build on the skills and techniques acquired in the prerequisite classes of Digital Media and Digital Animation 1. This technical course, which develops advanced knowledge and skills in the area of digital animation allows students to create, edit, and render characters, vehicles, scenes or objects and to design and produce digital animation using images, video, and audio resources. Students will learn, design and incorporate techniques and tools related to the technical production of drawings, renderings, and scaled models for commercial or media production purposes. Additional industry standard software packages and resources will be implemented into the delivery of the course.

Broadcast Video Production (310427)

Prerequisite: Teacher Approval

Fees: None

Full Year, 1.0 Technology Credit

Grade Level(s): 9 - 12

Broadcast Video Production 1 is a course that explores digital video and television production. Collaborative teams of students work to produce video projects using small cameras, while learning the basics of studio and field production, lighting and sound. They will gain experience in video editing using industry standard video-editing software, Premier Pro. Students will learn how to run professional equipment in a modern digital video studio and while live-streaming school events. Second semester, students will begin to learn the basics of producing a live video broadcast. As a portion of this class is the production of live-streamed events additional time outside the normal school day will be expected.



Broadcast Video Production 2 (310429)

Prerequisites: Broadcast Video Production 1, Teacher approval Fees: None

Full Year, 1.0 Technology Credit

Grade Level(s): 10 - 12

Broadcast Video Production 2 will build on skills learned in Broadcast Video Production 1. This class will take director roles in live-streamed events and handle the production of a school wide news magazine show the first semester. Second semester will be more project based allowing students to explore the techniques and styles of various video genres, while learning advanced production skills. Prerequisite for this class is Broadcast Video Production 1 or teacher approval. As a portion of this class is the production of live-streamed events additional time outside the normal school day will be expected.

Broadcast Video Production 3 - Film Making (Course Number Pending)

Prerequisites: Broadcast Video Production 2

Fees: \$20

Full Year, 1.0 Technology Credit

Grade Level(s): 11-12

This third tier class in the Broadcast Video Production continuum focuses on the technical aspects of film production. The focus of this course is learning the production process and technical aspects of making movies as well as developing materials for the Sting TV program's weekly broadcasts. The language, technical skills and aesthetics of cinematography such as editing, script writing, storyboard drawing, effective lighting, audio, directing, production responsibilities, computer generated graphics, animation, and special effects are woven into the presentation of this course. The professional skills learned in this course give students a first-hand opportunity to explore career choices within this industry.

Advanced Topics in Digital Media (Course Number Pending)

Prerequisites: Digital Animation 2 or Broadcast Video Production 3

Fees: \$20

Full Year, 1.0 Technology Credit

Grade Level(s): 12



This capstone class in the Creative Technologies cluster combines the student's knowledge and acquired skill sets of the previous courses taken within the cluster. Students enrolled in this course will design and produce a Senior project illustrating their acquired skills and knowledge base. The presentation of this senior project will be similar in requirements to other capstone courses within the SEBS program. Additionally, this set of students will support the graphic/video needs of the Sting TV program and productions.

Engineering Strand

Grade 9

Math (Algebra 1 or higher)

Introduction to Engineering Design (IED) ●○

Honors Physical Science *

English 1 or Honors English 1

US History

Science Technology Lab or Elective

Elective

Grade 10

Math (Geometry or higher)

Principles of Engineering (POE) ●○

CADD 2 *○

English 2 or Honors English 2

World History

Biology (Honors Biology available)

Elective

Grade 11

Math (Algebra 2 or higher)

Civil Engineering and Architecture (CEA) ●○, Digital Electronics (DE)●○ or Advanced Technology (Topics in Engineering)●○

Physics*

English 3 or AP English 3

American Government / Economics

Post-Secondary Option (PSO)○ course or Elective

Post-Secondary Option (PSO)○ course or Elective

Grade 12

Math Elective suggested (Math Analysis or higher)

Civil Engineering and Architecture (CEA) ●○, Digital Electronics (DE)●○, Special Topics in Engineering●, CADD 4●, or Engineering Design and Development (EDD)●

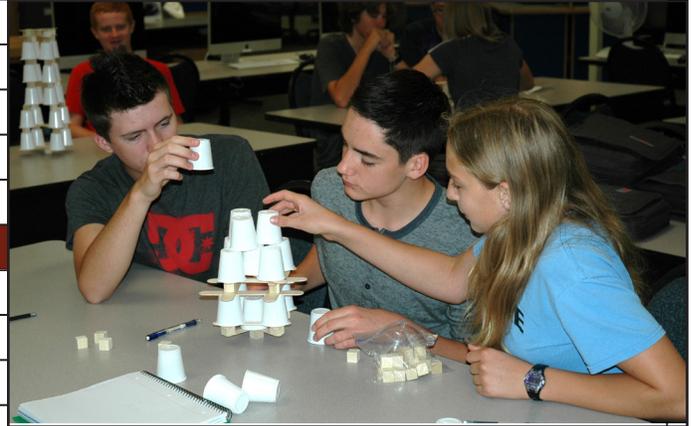
English 4, Technical English Career Prep, Accelerated English 4 or AP English 4

Post-Secondary Option (PSO)○ course or Elective

Post-Secondary Option (PSO)○ course or Elective

Elective (Chemistry suggested)

Elective



Each year, the first biomedical, computer science or engineering lab course requires a fee of \$20/year; for subsequent courses in the same year, the fee is waived (maximum \$20/year per student).

Introduction to Engineering Design (310295) QP Class

Prerequisites: None

Corequisite: Physical Science

Full Year, 1.0 Technology Credit, Quality Points

Fees: \$20/year*

Grade Level(s): 9 - 12

In Introduction to Engineering Design (IED), students will employ engineering and scientific concepts in the solution of design problems. In addition, students use a state-of-the-art 3D solid modeling design software package to help them design solutions to solve proposed problems. Students will develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges that increase in difficulty throughout the course. Students will also learn how to document their work as well as communicate their solutions to their peers and members of the professional community.



Science Technology Lab (303260)

Prerequisites: None

Full Year, 1.0 Science or Technology Credit

Recommended course for all freshmen students interested in the engineering or computer science strands.

Fees: None

Grade Level(s): 9-12

This modular science course incorporates material from biology, chemistry, and physics into a pre-engineering college preparatory program. The curriculum will be taught in a technology laboratory setting and will emphasize application as well as theory. The course provides students with an introduction into a variety of applied science areas such as aerodynamics, biotechnology, electronics, computer numerical control and fluid power.

Computer Aided Drafting and Design 2 (310020)

Prerequisites: Introduction to Engineering Design

Fees: \$20/year*

Corequisite: Principles of Engineering

Full Year, 1.0 Technology Credit

Grade Level(s): 10 - 12

This course is designed for students who have completed Introduction to Engineering Design class. Computer Aided Drafting and Design (CADD 2) will encompass, to a greater proficiency and accuracy level, all of the skills learned in Introduction to Engineering Design. New areas to be explored will include advance model design, parametric modeling and an introduction to architectural concepts. Design projects within the course are an exercise in the application of scientific concepts of the Principles of Engineering curriculum.

This course qualifies for dual credit through Colorado State University - Pueblo and the Senior to Sophomore program.

Principles of Engineering (310297) ^{QP Class}

Prerequisites: Physical Science or Teacher Approval and
Introduction to Engineering Design

Fees: None

Corequisite: CADD 2

Full Year, 1.0 Science Credit, Quality Points

Grade Level(s): 10 - 12

In Principles of Engineering (POE), students explore science concepts, technology systems and engineering processes to find out how math, science, and technology help people. The course explores the wide variety of careers in engineering and technology and covers various technology systems and manufacturing processes as they relate to scientific principles. Using activities, projects, and problems, students learn firsthand how engineers and technicians use math, science, and technology in an engineering problem-solving process to benefit people.

Digital Electronics (310299) ^{QP Class}

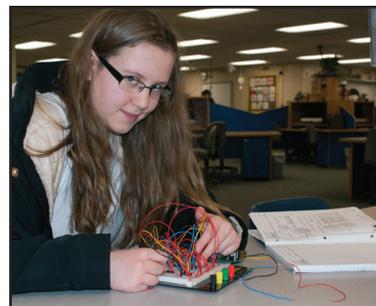
Prerequisites: Algebra 1

Fees: \$20/year*

Full Year, 1.0 Science Credit, Quality Points

Grade Level(s): 10, 11, 12

Digital Electronics (DE) is a course in applied logic that encompasses the application of electronic circuits and devices. Students use computer simulation software to design and test digital circuitry prior to the actual construction of circuits and devices. Students use computer simulation to learn about the logic of electronics as they design, test, and actually construct circuits and devices.



Civil Engineering and Architecture (310293) QP Class

Prerequisites: Introduction to Engineering Design and Teacher Approval or CADD 2

Fees: \$20/year*

Full Year, 1.0 Technology Credit, Quality Points

Grade Level(s): 11, 12

This overview of the fields of civil engineering and architecture emphasizes the inter-relationship and mutual dependence of both fields. Students use state-of-the-art software to solve real world problems and apply knowledge to hands-on projects and activities. By developing and implementing plans for a playground/park or vacation home, for example, students experience first-hand the job responsibilities of architects and civil engineers. By the end of the course, students are able to give a complete presentation to the client including three-dimensional renderings of buildings and improvements, zoning and ordinance constraints, infrastructure requirements, and other essential project plans. Teams of students collaborate on the development of community-based building projects and conceptual design for project presentations.

Computer Assisted Drafting Design 4 (310060)

Prerequisite: Civil Engineering and Architecture (CEA) and Teacher approval

Fees: None

Full Year, 1.0 Elective Credit

Grade Level(s): 12

Computer Assisted Drafting and Design 4 (CADD 4) is designed for students who excelled in either mechanical or architectural drafting and have the instructor's recommendation. The student must demonstrate an advanced understanding of two- and three-dimensional drawing, dimensioning practice, concepts of isometric drawing, parametric modeling. This individualized course will specialize for either mechanical or architectural concepts. These students will also serve as peer tutors for Introduction to Engineering Design and CADD 2 students.



Engineering Design and Development (310298) QP Class

Prerequisites: Successful completion of SEBS engineering strand coursework in grades 9-11 or with program director/teacher approval.

Fees: \$20/year*

Full Year, 1.0 Elective Credit, Quality Points

Grade Level(s): 12

This course is an engineering research course in which students work in teams to research, design, and construct a solution to an open-ended engineering problem. The product development life cycle and a design process will be used to guide and help the team to reach a solution to the problem. The team will present and defend its solution to a panel of outside reviewers at the end of the course.



Advanced Technology (310120)

Prerequisites: Teacher approval

Fees: \$20

Full Year, 1.0 Elective Credit

Grade Level(s): 11-12

Students build upon their knowledge through the creation of technology products related to biomedical science, creative technology, computer science, and/or engineering. They investigate and design products for specific audiences and purposes. Purposes may include scientific studies, conveyance of information, education, entertainment, and/or needs of society. Students enrolled in this course must be motivated to actively pursue further knowledge and skills in their particular area of interest.

Special Topics in Engineering (310140)

Prerequisites: Two prior engineering courses and teacher approval

Fees: \$20/year*

Full Year, 1.0 Elective Credit

Grade Level(s): 11-12



Students are provided opportunity for in-depth exploration of the newest and latest software packages used within industry today in varied areas of engineering such as robotics, proto-typing, architectural and mechanical design as well as the computer sciences.

English Courses

English 1 (301020)

Prerequisites: None

Fees: None

Full year, 1.0 English Credit

Grade Level(s): 9

Entering students will study a variety of literary genres including drama, poetry, short stories, essays and novels. They will learn appropriate literary terminology and will write essays and paragraphs. The study of standard rules of grammar and vocabulary will facilitate reading and writing. Various types of verbal communications, research methods, and creative writing are also studied in this course. In addition, students in English 1 will integrate with other curricular subjects, developing skills necessary across content areas. Students will work in-depth with the writing and vocabulary skills specific to the technical field that they are learning.

Honors English 1 (301110) QP Class

Prerequisites: English Teacher recommendation

Fees: None

Full year, 1.0 English Credit, Quality Points

Grade Level(s): 9

Incoming freshmen will study and learn at an accelerated pace. Conventions of English grammar will be reinforced through the study of literature genres including drama, poetry, short stories, essays, and novels. Upper level literary works including *The Odyssey* and *The Tragedy of Romeo and Juliet* will be studied intensively, along with an in-depth study of Shakespeare. Vocabulary is extensive and challenging. A formal research paper is required. In addition, students in Honors English 1 will integrate with other curricular subjects, developing skills necessary across content areas. Students will work in-depth with the writing and vocabulary skills specific to the technical field that they are learning. *Requires summer work.

English 2 (301040)

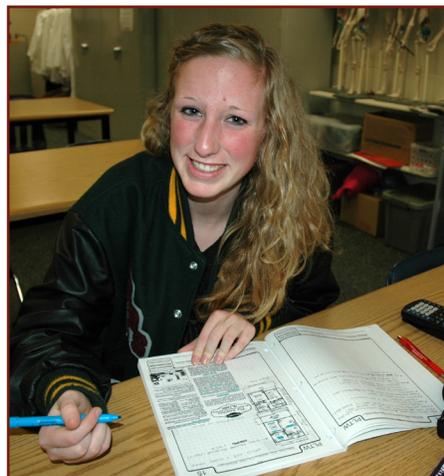
Prerequisites: English 1

Fees: None

Full year, 1.0 English Credit

Grade Level(s): 10

This course is for students who have demonstrated proficiency in English 1. The course includes critical reading of various genres to discern themes and make practical applications. Discussion and expository composition are used to develop a thesis for a formal research paper which adheres to standard rules of English grammar and syntax. Vocabulary is extensive and challenging. In addition, students in English 2 will integrate with other curricular subjects, further developing skills necessary across content areas. Students will continue to build the writing and vocabulary skills specific to the technical field that they are learning.



Honors English 2 (301130) ^{QP Class}

Prerequisites: English 1, teacher recommendation

Fees: None

Full year, 1.0 English Credit, Quality Points

Grade Level(s): 10

This course is for students who have demonstrated mastery or proficiency in Honors English 1. This course will include critical reading of various genres to discern themes and make practical applications. Discussion and expository composition are used to develop a thesis for a formal research paper which adheres to standard rules of English grammar and syntax. Vocabulary is extensive and challenging. In addition, students in Honors English 2 will integrate with other curricular subjects, further developing skills necessary across content areas. Students will continue to build the writing and vocabulary skills specific to the technical field that they are learning.

*This course requires summer work.

Technical English Career Prep (number pending)

Prerequisites: English 3 or above

Fees: none

Full year, 1.0 English Credit

Grade Level: 12

Technical English Career Prep (TECP) is an English course designed to use real world tasks and scenarios in order to present students with English from a variety of technological fields while incorporating the advanced grade English standards. Tasks and standards are presented to students through projects and a progressive portfolio. Through the use of interest-specific articles, smaller traditional readings, and smaller writing components that build into the final portfolio, students will develop communication skills that will prepare them for the workforce.

Choices in English by year

Freshmen year	Sophomore year	Junior year	Senior year
English 1	English 2	English 3	English 4
Honors English 1	Honors English 2	College Prep (CP) English 3	College Prep (CP) English 4
Four credits of English are required to graduate from high school in Pueblo District 70.		Advanced Placement (AP) English 3	Advanced Placement (AP) English 4
			Technical English Career Prep



Students enrolled in the School of Engineering and Biomedical Science should aspire to Honors English both freshmen and sophomore year. These courses are offered within the SEBS program. During the junior and senior year, SEBS students are encouraged to enroll in College Prep English or Advanced Placement English courses. For course descriptions, please see the Pueblo County High School Course Guide.

Science Courses

Honors Physical Science (303002) QP Class

Corequisite: Introduction to Engineering Design, Principles of Biomedical Sciences or Computer Science Principles

Fees: None

Full Year, 1.0 Science Credit, Quality Points

Grade Level(s): 9

This course is required of all freshmen students in the School of Engineering and Biomedical Science.

This course lays the foundation of scientific thinking that will be built upon in later studies within the School of Engineering and Biomedical Science. The scientific method and scientific problem solving processes are stressed as students study the role of mathematics in science, properties, composition, and behavior of matter, and energy concepts. Online interactive learning activities and hands-on application of principles through traditional labs and interactive activities solidify concepts taught in this course.

Honors Biology (303100) QP Class

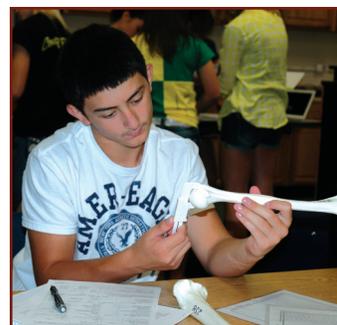
Prerequisites: Teacher Recommendation

Fees: None

Full Year, 1.0 Science Credit, Quality Points

Grade Level(s): 10

Students develop an in depth understanding of the complexity and diversity of living things and how they interact with each other and the non-living environment. The chemical basis of life is stressed at the level of the atom, molecule, cell, organ system, and organism. Functions of cells, cell division, and heredity are investigated thoroughly. Species adaptation and the classification of the diverse species within the five kingdoms is also studied. Classroom discussion and lab activities are designed to enhance learning while gaining an understanding of how the concepts and ideas of biology are influencing the way we live and work.



Biology (303040)

Prerequisites: None

Fees: None

Full Year, 1.0 Science Credit

Grade Level(s): 10

Students learn about the complexity and diversity of living things and how they interact with each other and the non-living environment. The chemical basis of life is investigated at the level of the atom, molecule, cell, organ system, and organism. Functions of cells, cell division, and heredity are investigated thoroughly. Species adaptation and the classification of the diverse species within the five kingdoms is also studied. Classroom discussion and lab activities are designed to enhance learning while gaining an understanding of how the concepts and ideas of biology are influencing the way we live and work.

Chemistry (303140)

Prerequisites: Honors Physical Science

Fees: None

Full Year, 1.0 Science Credit

Grade Level(s): 11, 12

This fast-paced course is based upon the foundational concepts studied in Honors Physical Science and is designed to extend the student's understanding and application of general chemistry principles and theories. It is recommended for all students planning to enter the fields of science, medicine, or engineering and is a required course for all SEBS Biomedical Strand students. Topics include atomic theory, stoichiometry, nomenclature, solution behavior, and nuclear chemistry. Safe lab procedures are practiced along with detailed and accurate laboratory write-ups. A strong background in algebra is necessary. This class may be available for college.

Physics (303180)

Prerequisites: Geometry, Corequisite: Algebra 2 or higher

Fees: None

Full Year, 1.0 Science Credit, Quality Points

Grade Level(s): 11, 12

This course is based on a unifying approach to the study of the basic energy systems and integrates an understanding of principles and concepts with practice. The energy systems studied include mechanical, fluid, electrical, and thermal systems. Students build upon the important concepts learned in Principles of Engineering such as force, work, rate, resistance, energy and power as well as learn new concepts such as waves and light and the electrical concepts of magnetic fields and magnetic levitation. Associated mathematical calculations related to these concepts will also be studied.



Social Studies Courses

US History (304020)

Prerequisites: None

Fees: None

Full Year, 1.0 Social Studies Credit

Grade Level(s): 9

This course is the culminating study of United States History for District 70 students and is a requirement for graduation. This course covers the following themes: cause and effect relationships, movement, technological advances, human interaction, and global influence using maps, media center resources and current events.

World History / Geography (304010)

Prerequisites: None

Fees: None

Full Year, 1.0 Social Studies Credit

Grade Level(s): 10

Students will study World History and Geography with an emphasis of study on the historical perspective of the development of the world from the beginning of society. Students will acquire information relating to the development of the seven continents and the countries on them. Students will study the major topographical features, capitals, political, social, and economic aspects associated with each area studied. They will learn about past and current relationships between and among countries.

American Government (304040)

Prerequisites: None

Fees: None

One Semester, 0.5 Social Studies Credit

Grade Level(s): 11

Credit in this course must be earned to meet graduation requirements.

Students are introduced to the study of the governmental processes in the United States and how comparative governments around the world function. Topics such as the Constitution of the United States, the function and relationship of the three branches of government and the citizen's role in local, state, and national government will be discussed. Integrated writing and technology projects will be incorporated into the curriculum.

AP US Government and Politics - (304041)

Prerequisites: None

Fee required for the optional AP exam

Full Year, 1.0 Social Studies Credit

Grade Level(s): 11, 12

Class Requirements: Summer work required

Advanced Placement United States Government and Politics is designed for student who wish to have an analytical and detailed approach to the studying of United States government and politics. Units of study include: Constitutional Underpinnings and Federalism, Political Beliefs and Behaviors, Political Parties, Interest groups and Mass Media, Institutions of National Government, Public Policy, Civil Rights and Civil Liberties. This course is an entry-level college course and will be taught as such.

*Note: Students must plan for, and take, Economics as it is a 0.5 credit District 70 social studies graduation requirement. Please see the Pueblo County High School course guide for information.

General Elective and Physical Education Courses

Documented Physical Education (305240)

Prerequisites: None

Fees: None

Semester, 0.5 Physical Education Credit

Grade Level(s): 9-12

Only approved, organized physical education activities qualify.

Each semester a student participates in an organized and approved physical education activity can earn the student 0.5 credits. Students and parents must submit proper application for approval at the beginning of the semester to be eligible for this opportunity. Students must provide signed documentation of 90 hours of instruction by a certified trainer/coach at the close of the semester.

Health Waiver (305510)

Prerequisites: None

Fees: None

Semester, No Credit

Grade Level(s): 9-12

A signed health waiver request form is required.

By enrolling in this course, students may be excused from attending a class on health topics. However, the 0.5 credit requirement is not waived. Students must earn an additional 0.5 elective credit if parents/guardians choose the health waiver option for their student. A signed health waiver request form is required for this option.

Teacher Assistant (315700)

Prerequisites: Teacher approval required

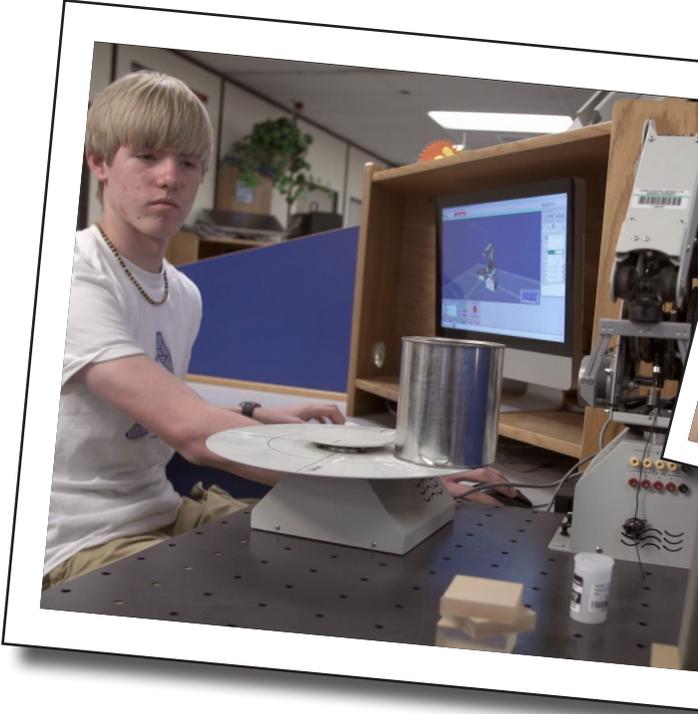
Fees: None

Full Year, 1.0 Elective Credit

Grade Level(s): 11-12

A student must obtain approval from the SEBS Dean/Coordinator and specific instructor to become an aide for that instructor. The student will receive a satisfactory or unsatisfactory grade for this class. Satisfactory completion of this class will result in earning 0.5 credits.





SEBS

