

Innovation Center Course Catalog 2022-2023

The Innovation Center is the next step in public education. We provide opportunities to experiment with extraordinary ideas, technologies, and projects to solve real-world problems. We are a catalyst, incubator, and bridge between education, industry, and our community.

If you have any questions regarding registration, please email varela_mary@svvsd.org

[AERONAUTICS](#), [BIOSCIENCE](#), [CREATIVE COMPUTING & DESIGN](#), [CYBERSECURITY](#), [ENTREPRENEURSHIP](#), [IC STUDIOS](#), [INFORMATION & COMMUNICATIONS TECHNOLOGY](#), [P-TEACH](#), [ROBOTICS](#)

AERONAUTICS

UAS Flight Concepts & Training: CTE83150: Fall & Spring

- Open to all 9-12th graders (No prerequisites)

AVT 155 - Introduces and develops flight control and piloting techniques for common Unmanned Aerial System (UAS) platforms. Students learn and demonstrate maneuvers, procedures, and best practices for safe UAS operation on fixed wing and rotary wing systems. Develops the skills and knowledge required to be a pilot of a UAS in the National Airspace System. Students who are new to aviation will develop functional knowledge in the areas of pilot-in-command responsibilities, aerodynamic principles, aviation meteorology, and the flight environment.

UAV Engineering and Design: CTE83155: Fall & Spring

- Open to all 9-12th graders (Ideally finishing UAS Flight Concepts & Training first)
- This is a required course for students participating in the [Erie High School Aerospace pathway](#).
 - Course requirement Year 2 Semester 2 of Erie High School's Aerospace pathway within their Academy of Engineering & Aerospace

Utilizing the industry standard Aircraft Design Cycle and fabrication laboratory equipment, students will have the opportunity to engineer and design a UAV recreational and commercial fixed wing and multirotor aircraft to solve a real world problem.

UAS Applications: CTE83151: Fall

- Open to all 10-12th graders

Students get involved with UAS industry related work and support in the Aeronautics program development. Students learn to work on project teams, develop scopes of work, apply engineering principles and design thinking practices, utilize new fabrication equipment, manage contractual and non- contractual based UAS work. Students could option for SVVSD employment.

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UAS Design Integrations 1 - CTE83152: Fall & Spring

- Open to 11-12th graders who have completed UAS Flight Concepts & Training (CTE83150) and UAVED (CTE83155)

In a one to two semester project of study, students design a new product/ process solution through a COTS UAS drone integration approach. Utilizing the design thinking model and Innovation Center technologies, students learn to develop a UAS centered problem and work with the current industry for possible design solutions. This course partners with the IC Entrepreneurial program for student business fundamentals and practices.

UAS Design Integrations 2: CTE83153: Fall & Spring

- Open to 11-12th Graders who have completed UAS Design Integrations 1 (CTE83152)

In a one- to two-semester project of study, students will design a new product/ process solution through a COTS UAS drone integration approach. Utilizing the design thinking model and innovation center technologies, students will learn to develop a UAS centered problem and work with current industry for possible design solutions. This course partners with the IC Entrepreneurial program for student business fundamentals and practices.

Pilot Ground 1: CTE83157: Fall & Spring

- Open to all 10th-12th graders

Intro to Pilot Ground I begins the SVVSD Private Pilot course pathway for students who may be interested in exploring careers in the general aviation industry. This course begins the foundational skill set and knowledge for those students interested in becoming a certified pilot. Students will develop and exhibit aeronautical decision making during all operations of a Cessna 172 Skyhawk with special emphasis on situational awareness, risk and task management, and aircraft control. Students will also demonstrate a basic level of proficiency in flight operations and performance in the areas of preflight preparations and procedures, departure and flight operations, various maneuvers and navigation, instrumentation and post-flight procedures.

Pilot Ground 2: CTE83158: Spring

- Open to all students who have completed Pilot Ground 1 (CTE83157)

Intro to Pilot Ground II continues the SVVSD Private Pilot course pathway for students interested in exploring careers in the general aviation industry. This course develops awareness and skill in aeronautical meteorology, advanced navigation, and day or night cross country flight planning and execution. Students will be introduced to instrument and commercial flying at the basic level and will be able to demonstrate proficient decision making skills in various phases of flight. We will also begin to explore the requirements of training and how to become a professional pilot. The FAA Private Pilot written exam will also be introduced, giving students the opportunity to obtain an industry certificate, if they so choose.

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AVT101 Private Pilot Ground School: CTE8TBD: Fall & Spring

- Open to all students 10th-12th graders

Private Pilot Ground School presents the fundamentals of aviation for the beginning student pilot which includes a study of a Cessna C-172 Skyhawk and its components, aerodynamics, basic aircraft systems, the airport environment, air-traffic control procedures, Federal Aviation Regulations, the basic elements of air navigation including radio navigation, and aviation weather. This course will prepare the student for the Federal Aviation Administration (FAA) Private Pilot Airplane knowledge examination, an industry certificate that brings them closer to becoming a certified Private Pilot. Students will be able to learn real pilot skills such as precision flying, navigation, procedures, maneuvers, and communications and become proficient in FAA Airmen Certificate Standards (ACS). Students will be prepared to begin flight training at local flight schools and obtain college course credit.

AVT107 Aviation Discovery: CTE8TBD: Fall & Spring

- Open to all students 9th-12th graders

Aviation Discovery introduces students to the aviation industry. This course teaches about technologies of the past, present and foreseeable future of aviation and aerospace and prepares students for careers in aviation by creating pathways and developing skills required in the field. We explore from the beginnings of aviation to aviation in the future. There will be a look at the history of airships, aviation pioneers, Federal Aviation Administration, Air Traffic Control, aviation airspace, aviation weather, future aviation and careers in aviation. By the end of this course, we hope students have a great understanding of aviation and the limitless potential of the industry.

BIOSCIENCE

Experimental Science: CTE85118: Fall & Spring

- Open to all 9-12th graders; no prerequisites

This course explores introductory laboratory fundamental principles and procedures performed in general biology, biochemistry, biogeology and physics lab settings. This course covers many basic scientific principles; however, that is not the focus of course. Students utilize lab equipment and apply the scientific method to a series of experiments across all scientific disciplines. Additionally, they will learn and be required to follow all necessary safety regulations and lab notebook documentation. This class prepares students to be critical thinkers and for future science and hands-on engineering and design courses, as well as an introduction to careers in professional lab settings.

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Data Science: CTE83240: Fall & Spring

- Open to all 10 - 12th graders

The course focuses on current data collection in our local community and teaches data science skills that are highly sought after in today's physical science world. Students will gain practical experience with data science tools and collection methods, as well as data organization and presentation used in industry today. Students will work with several community partners to apply the data to real world problems. Students have the opportunity to receive GIS badging. This multidisciplinary course will prepare students for future careers or coursework in environmental science, social science, biology, or engineering.

Introduction to Biotechnology: CTE85115: Fall & Spring

- Open to all 11-12th graders

Introduction to Biotechnology is a course designed to give students a comprehensive introduction to the scientific concepts and laboratory research techniques currently used in the field of biotechnology. Students will attain knowledge about the field of biotechnology and deepen their understanding of the biological concepts used. In addition, students will develop the laboratory, critical thinking, and communication skills currently used in the biotechnology industry. Furthermore, students will explore and evaluate career opportunities in the field of biotechnology through readings, laboratory experiments, class discussions, research projects, guest speakers, and workplace visits.

Introduction to Biomedical Engineering: CTE85110: Spring (1 Credit)

- Open to all 11-12th graders
- Concurrent Enrollment with Colorado State University
- Course Fee TBD

This survey-based course through Colorado State University exposes students to how mechanical engineering, chemical/biological engineering, and electrical engineering principles can be applied to current biomedical challenges. The course also introduces current research efforts at CSU, BME career opportunities, team dynamics, and accessing/reading academic literature - all of which will be valuable as the student progresses through their interest area. Students will also be able to go through the process of solving an engineering problem and presenting a product concept to various audiences at CSU.

CREATIVE COMPUTING & DESIGN

Digital Storytelling - an Introduction to Augmented & Virtual Reality Technologies: CTE81100: Summer, Fall, & Spring

- Open to all 9-12th graders (No prerequisites)

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This course introduces students to **techniques**, principles and skills required to develop unique experiences and applications utilizing Augmented (AR), Virtual (VR), and Mixed Realities (MR) across a variety of use case scenarios. Participants will have access to state-of-the-art AR/VR technologies such as 360 degree video cameras, HTC Vive, Oculus Rift S, Oculus Quest, Oculus Go, **PICO NEO**, Windows VR, and Samsung Odyssey. Being able to develop VR and AR experiences gives each student cutting edge knowledge in an industry in need of talented staff. The average starting salary for a developer in this field is \$75,000 a year. Learning in this field allows students to build technical literacy and express creativity in an immersive engaging computer aided design field.

A/R & V/R Development for STEAM: CTE81110: Spring

- Open to all 9-12th graders

This class is equally applicable to those who are interested in understanding AR & VR technologies as well as those who want to use these as tools for solving real-world challenges. Students are introduced to a variety of applications and experiences employing project-based learning techniques which will be used to develop solutions in such areas as societal, industry, academic and community challenges. Working individually and as teams, participants will employ principles of Design Thinking, Project Management, Engineering and the Arts to create new and innovative solutions covering a variety of real-world topics. Projects may include work with industry partners and commercial mentors.

Introduction to Game Design: CTE83230: Fall or Spring

- Open to all 9-12th graders who have completed a prior computer science course

This is an introductory course to video game programming, design, and video game art. Students will learn the principles and practice of modeling, applying textures and materials to those models, and rendering them with appropriate lighting. Additionally, students will be introduced to the game design theory behind designing an enjoyable, balanced game. At the end of the course students will have the opportunity to apply the skills they learned to build their own game.

Advanced Game Design: CTE83235: Spring

- Open to all students that have completed Introduction to Game Design

Building on the skills learned in Introduction to Game Design, students will design, develop, and program games in Unity. Students will continue to refine their skills in modeling, game theory, and working with the Unity interface. At the end of the course students will have the opportunity to apply the skills they learned to build their own 3D games.

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Intro to Cybersecurity: CTE80120: Fall, & Spring

- Open to all 9-12th graders (No prerequisites)

508,000 That is the number of jobs that are currently unfilled in the field of Cybersecurity. Cybersecurity is an in-demand field that affects all industries. Cybersecurity threats are ongoing and pose risks for individuals and corporations alike. In this course, students will learn how to protect themselves and businesses from these attackers. This course will delve into the following topics: Citizen Security, Encryption, Types of Attacks, Networking, Cyber Defense, Ethics and Law, and Risk Management. We will use hands-on activities with industry tools to engage students.

Python in Cybersecurity: CTE80125: Fall & Spring

- Open to all 9-12th graders (Coding knowledge preferred, but not required)
- The cost of the certification exam is \$59 and students will pay for their own certification.

Python is an extremely versatile language that is used by startups and tech giants in the field such as Google, IBM, Drop Box, and Facebook to list a few. In the first quarter of this course, we will go through the basics of Python including: data types, variables, conditional statements, looping, functions, text files, and OOP. In the second half of this course, we will apply our Python programming knowledge to Cybersecurity related needs such as password cracking, automating systems, ethical hacking, and forensics. At the end of this course, students will have the opportunity to take the PCEP - Certified Entry Level Python Programming Certification.

Ethical Hacking: CTE80130: Fall

- Must have completed either intro to Cybersecurity (CTE80120) or Cyber Patriots
- Open to 10-12th graders

This course will be an introduction to the principles and techniques associated with the cybersecurity practice known as penetration testing or ethical hacking. The course covers planning, reconnaissance, scanning, exploitation, post-exploitation, and result reporting. The student discovers how system vulnerabilities can be exploited and learns to avoid such problems. Students can practice what they have learned in a cloud based infrastructure with hands-on labs. These labs will simulate real life scenarios and will be accessible on any device that has a browser and an internet connection.

Linux Essentials: CTE8TBD

- Open to 9-12th grade (No prerequisites)

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This course thoroughly covers Linux fundamentals. You'll begin with basic principles and the Linux way of doing things, then move on to common user programs such as the command line and text editors. With these skills in hand, you can tackle system administration tasks, such as user management and network configuration. At the end of this course, students will be prepared to take the Linux Essentials exam.

DESIGN

Design Foundations: CTE86110: Fall & Spring

- Open to all 9-12th graders

This course teaches the basics of design including: what design is, sketching, drafting, rendering, presentation, the critique process, concepting an idea and translating it to a design brief. In addition, this course will give students a taste of the various types of industrial design they can continue with - transportation and mobility, product, and Human Machine Interface. Students will be asked to keep a sketchbook which will be part of the course.

Introduction to Product Design: CTE86115: Fall & Spring

- Open to all 9-12th graders that have completed Design Foundations

Introduction to Product Design builds on the Design Foundations Course in that it provides students the opportunity to continue building their design skills around the field of product design. Students will learn how to research, ideate, sketch, render, 3D model, and present concepts for products that would be used in everyday life. In addition, weekly critiques and showcases will allow students to participate in the critique process and learn from one another, learning how to be part of teams and collaborate on projects. Students will be asked to keep a sketchbook which will be part of the course. As design becomes an ever more important field in that it can add significant value to companies products and operations, this course seeks to enable students to get a head start in the field of design and learn more about it as a career opportunity.

Intro to Transportation Design: CTE86117: Fall & Spring

- Open to all 9-12th graders that have completed Design Foundations

Imagine if you could learn how to design Cars, Bikes, Skateboards, Plane interiors, and more in high school! That is precisely the goal of this class. While the field of Transportation Design exists in colleges and universities around the world, it is not taught at the high school level. This class builds on the design foundations course taught at the Innovation Center to teach students how to design vehicle and vehicle interiors. Students would

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learn sketching and rendering techniques specific to vehicle design, as well as information about proper vehicle proportions, how to package a vehicle, how to think about cars from a design and engineering standpoint, and how to think about vehicle interiors.

ENTREPRENEURSHIP

BUS102 Entrepreneurial Operations: CTE80100 - Fall & Spring

- One Semester Elective - 0.5 Credit - Open to all 11th and 12th graders (10th grade students encouraged and 10th graders seeking FRCC credit only with prior instructor approval)
- Concurrent Enrollment with FRCC as **BUS102 Entrepreneurial Operations**

This course inspires and engages students with perseverance and determination of an entrepreneurial mindset needed to succeed in business, life and academics. It covers major aspects of small business management to enable the entrepreneur to successfully begin their own business. This course provides the basic concepts of marketing, principles of management and finance needed to manage a small business. This course provides for experiential learning beyond the classroom, making connections, understanding business concepts, and building relationships that support the student throughout college and careers.

Entrepreneurial Business Development: CTE84130: Fall & Spring

- Open to all 10-12th graders; no prerequisites

This course covers the major aspects of small business management to enable the entrepreneur to successfully begin their own business. The coursework will support the Entrepreneurial MindSet through developing the business principles needed to start a business. The course will go more in depth in the areas of Marketing, Business Planning, Analysis of Markets, Management, Financials and understanding the service or product line. The course will require an Entrepreneurial Portfolio to be developed with which there is the potential for the student to utilize as a way to start a business.

IC STUDIOS

TriCaster Certification Program: CTE82100: Fall & Spring

- One Semester Elective - 0.5 Credit - Open to all 9 -12th graders
- Students who pass the class will pay for their own certification test - \$150

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Becoming a NewTek TriCaster Certified Operator is one skill that can help students work within the studio and television world. The course focuses on benefits of certification including get hired for better jobs, and being recognized by broadcast industry professionals, and becoming qualified to teach TriCaster Skills to others. Students will engage in operating a TriCaster system within a studio environment to include understanding of audio, video and lighting concepts. Learn the live television and production environment. Successful students in this course will be ready to take the TriCaster certification test.

Studio Film Production: CTE86130: Fall

- Open to all 9-12th graders; no prerequisites

The course provides authentic real world experience into the Studio, Film and Multimedia Communications environment. The course allows students to participate and be exposed to real world studio/ Im environments that require the application of technical skills. Students will be exposed to industry specific regulations, techniques and processes. The course will teach basic Im terminology, professional set etiquette and production techniques, how to write broadcast television formats and develop writing skills related to broadcasting and Im production.

INFORMATION & COMMUNICATIONS TECHNOLOGY

Apple Certified Mac & iOS Technician: CTE83110: Fall, & Spring

- Open to all 11-12th graders (and exceptional 9th & 10th graders with prior Apple product knowledge)
- Summer, Fall, & Spring Semesters

ACMiT is designed for students who have experience with Apple devices computers; offering the same curriculum used to train Geniuses in Apple Stores. Students who succeed in this class will be able to take certification exams assessing their knowledge of the following devices: MacBook Air, iMac, Mac Mini, MacBook Pro and more. Students passing these official Apple certifications will be eligible to work on the Innovation Center Tech Team. Graduating certified students will work with Apple representatives to find placement in tech jobs at Apple and on college campuses.

CompTIA: IT Fundamentals: CTE83120: Summer, Fall, & Spring

- Open to all 9-12th graders (No prerequisites)
- Students who pass this class will pay for their own certification test - \$90

IT Fundamentals introduces students to the Information Technology field; including computer hardware & software support, customer service, networking, security, and computer design. This class serves as both an introduction to computers and computing as well as being a precursor to the CompTIA A+ program. The ITF+ program is intended for beginners with no prior computer knowledge with students who succeed in this class being eligible to take the CompTIA IT Fundamentals certification. This program combines hands-on experiential learning with classroom instruction.

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CompTIA A+ Hardware: CTE83121: Fall

- Open to 9th-12th graders (prerequisite of IT Fundamentals or Instructor Approval)
- Students who pass this class will pay for their own certification test - \$90

The Comp TIA A+ program is the first of two classes preparing students to achieve the CompTIA Industry A+ Certification, the most widely recognized certification in the Information Technology industry. Combining classroom instruction, hands-on labs, and industry design sessions, students are exposed to a wide variety of issues ranging from design/build of computing devices (desktops, laptops, mobile devices and other), networking, communications and storage technologies. This class is intended for those who already have extensive computer experience across multiple platforms, and those who have passed IT Fundamentals.

CompTIA A+ Software: CTE83122: Spring

- Open to 9th-12th graders (prerequisite of IT Fundamentals or Instructor Approval)
- Students who pass this class will pay for their own certification test - \$90

A+ Software is the second of the two classes required of students to take the CompTIA A+ Industry Certification, the most widely recognized certification in the Information Technology industry. Students will understand a wide variety of issues covering operating systems, applications, utilities and troubleshooting tools and techniques including such areas as networking and cybersecurity. This class is intended for those who have extensive computer experience across multiple Operating Systems, and those who have passed IT Fundamentals.

CompTIA Network +: CTE83123: Fall or Spring

- Open to 10-12th graders (students who have passed IT Fundamentals or by instructor approval)
- Students who pass this class will pay for their own certification test - \$90

The CompTIA Network+ program covers a wide range of knowledge and skills that apply to a variety of networking job roles and career paths. Topics covered include developing a fundamental knowledge of network design, terminology, hardware and software components, connectivity methods, standards, and configurations. Students will perform a variety of hands-on labs leading to the design and installation of SOHO (Small Office Home Office) networks. Upon completion students will achieve fundamental skills in wired, wireless, cellular and mobile network connectivity, maintenance, security and troubleshooting.

P-TEACH

For any questions, email Wendy Howenstein (howenstein_wendy@svvsd.org)

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P-TEACH: Introduction to Early Childhood Education: PS470: Fall A3 A9 Rudman

- Open to 10-12th graders
- One semester elective - 0.5 credit
- Concurrent Enrollment CU - Denver (3 College Credits)

This course provides an overview of the early childhood profession and the philosophical and historical foundations of services to young children and their families. State and national trends, resources and standards for early childhood care and education, professionalism, and code of ethical conduct are examined. Key areas of ECE professional knowledge are introduced: developmental domains and milestones, developmentally appropriate practice, evidence-based practice and intentional teaching, curriculum models, guidance strategies, family and community relationships, diversity and inclusion, and the leadership skills and organizational climate to support quality early care and education work settings.

P-TEACH Language, Power and Identity: PS474 Fall 2023, Fall 2025- Howenstein (Alternates with Child Guidance)

- Open to 10-12th graders
- One semester elective - 0.5 credit
- Concurrent Enrollment CU - Denver (3 College Credits)

This course explores the relationship between language, identity, and power in various educational and international contexts. Curriculum includes a survey of race, ethnicity, gender, media, criminal justice, and the creation of safe, engaging and inclusive spaces for teaching/supporting children. The course considers how legacies of inequality for particular communities are reflected in societal attitudes about languages and language users and subsequent language planning.

P-TEACH: Early Field Experience: PS473: Fall and Spring- Howenstein

- Open to 10-12th grader
- One semester elective - 0.5 credit
- Concurrent Enrollment CU - Denver (3 College Credits)

This field experience and seminar is designed to support your first foray into educator preparation. You will be introduced to the wide array of skills and practices that support working effectively with youth in the context of their local community. Working within the community to support children's academic and social development requires a disposition of being grounded in the community—the experiences of this seminar, paired with your work at a local school or community organization will help you to develop this grounding.

P-TEACH: Internship: CTE9999: Fall and Spring (.05- 1 credit) - Howenstein

- Open to 9- 12th graders
- One semester elective- 0.5 credit

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Students are eligible to participate in an education specific internship in the P-TEACH pathway of their choice. Internships may be either paid or unpaid depending on qualifications and experience. Students may earn up to 1 elective credit for every 60 hours spent on the internship. Internship opportunities are individualized to match the interests and experience level of students. Current internship opportunities range from Community Schools, PreK, Elementary, or Secondary, Music, Art, SPED, Speech, Coaches, etc... For questions please email: howenstein_wendy@svvsd.org

P-TEACH Child Development: PS471: Spring 2022, Spring 2024 (Alternates with STEM Methods) Howenstein & Rudman

- Open to 10th - 12th Graders
- One Semester Elective - 0.5 Credit
- Concurrent Enrollment CU - Denver (3 College Credits)

This course focuses on the study of human growth, development and ecology from conception to adolescence. The emphasis is on the major theories of child growth and development and the implications of current research findings to better understand child development. For questions please email: howenstein_wendy@svvsd.org

P-TEACH Understanding Disabilities: PS475: Spring - Curton

- Open to 10th - 12th Graders
- One Semester Elective - 0.5 Credit
- Concurrent Enrollment CU - Denver (3 College Credits)

This course is designed to provide a basic introduction to special education and the needs of students who have disabilities. It includes introductory material regarding legal and historical foundations of special education, human growth and development, the nature of disabilities, and an introduction to the basic human needs that must be addressed. For questions please email: howenstein_wendy@svvsd.org

P-TEACH STEM Methods: PS476: Spring 2023 (Alternates with Child Development) Brohm & Rudman

- Open to 10th - 12th Graders
- One Semester Elective - 0.5 Credit
- Concurrent Enrollment CU - Denver (3 College Credits)

The STEM Methods course is a framework-based class where students will develop a strong understanding of the STEM for All framework, focusing on integration, innovation, essential skills, personalization, adaptation and connection. This framework will support the development of a STEM mindset, and by learning these processes, students will create STEM-aligned lesson plans for any content or grade. Students will use these skills to plan and carry out their own STEM-aligned lessons. For questions please email: howenstein_wendy@svvsd.org

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P-TEACH Child Guidance: PS474 : Fall 2022, Fall 2024 (will Alternate with Language, Power and Identity)- Howenstein

- Open to 10th - 12th Graders
- One Semester Elective - 0.5 Credit
- Concurrent Enrollment CU - Denver (3 College Credits)

This course explores and applies classroom strategies to promote social competence, build classroom community and facilitate emotional regulation. An emphasis is on understanding development within group contexts, observing children's behavior and engaging with families to make decisions about learning. For questions please email: howenstein_wendy@svvsd.org

For Pathways Seniors we offer college credit for Freshman College Math and English

P-TEACH English 121 Fall and 122 Spring (6 college credits)

P-TEACH Math 121 Fall (3 college credits)

For questions please email: howenstein_wendy@svvsd.org

ROBOTICS

Robotics Exploration: CTE83201: Fall

- Open to all 9 - 12th graders

If you have had little or no experience with robotics, this course is a perfect introduction. You will learn about the wide world of robotics by exploring the different types and uses of robots in our world as well as possible robotic careers. Activities will be very hands-on and you'll have a chance to explore the different standards of robotics (like design, fabrication, electronics, computer science) using fun and unique technologies at the Innovation Center.

Robotics 1: Introduction to Robotics Online Course: Fall & Spring

- Open to all 9-12th graders

Robotics I is a one-semester online course that explains various concepts related to robotics. The course begins by describing the evolution and applications of robotics. The course helps you identify career opportunities and important employability skills in robotics. You will explore Newton's

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laws of motion and their applications in robotics. You will learn and apply basic concepts of electricity, electronic circuits, Boolean algebra, magnetism, and their applicability to robotics. And you will be provided an option to construct a simple robot.

This course is being designed and delivered in partnership with Colorado Digital Learning Solutions and the St Vrain Valley School District Innovation Center and delivered by a team of St Vrain teachers and students. For registration information, email Nate Wilcox (Wilcox_Nathan@svvsd.org)

Introduction to Artificial Intelligence: CTE83220: Fall & Spring

- Open to all 9 - 12th graders

Artificial Intelligence is a rapidly evolving field that is quickly transforming our society. This introductory class will explore this new and growing field by exploring the question of what intelligence is and how people and machines can learn; the importance of data to AI; the use of hardware to create a Smart environment; and the ethics challenges we face in an increasingly connected world. Students will have the chance to try out various cutting-edge technologies, ranging from IBM's Watson to Misty and NAO robots. Some experience with programming and/or robotics is helpful, but not required.

Robotics A: Design/Electronics: CTE83205: Fall

- Open to all 9th-12th Graders

This course will have a strong focus on how robots are designed and built. It is one of two courses designed to help you build up your robotics skillset and, in turn, to prepare you for more rigorous and authentic robotic opportunities like Robotics for a Better World and Competitive Robotics. You'll explore the following in this course:

- Fundamentals of 2-D and 3-D design
- Human-centered and engineering design processes
- Tools and approaches for design (sketching, CAD)
- Prototyping techniques and materials
- Basics of electronic design
- Mechanics of effective robotic design
- Engineering practices such as testing and documentation

Robotics B: Computer Science & Applied Engineering: CTE83207: Spring

- Open to all 9th-12th Graders
- We suggest experience with one of the following: (1 semester of an introductory robotics course, completion of Introduction to Robotics Online, or competitive robotics experience)

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This course will have a strong focus on how robots are programmed and the interdisciplinary nature of Robotics. It is one of two courses designed to help you build up your robotics skillset and, in turn, to prepare you for more rigorous and authentic robotic opportunities like Robotics for a Better World and Competitive Robotics. You'll explore the following in this course:

- Fundamentals of Computer Science in Robotics
- Human-centered and engineering design processes
- The relationship between robotics and math, science, material science, etc.
- Engineering practices such as testing and documentation

Applied Robotics: CTE83202: Fall or Spring

Conservation(Fall): Help save the Northern Redbelly Dace! Native fish species in Colorado are under threat due to habitat modification, altered stream flow and invasive species. You will work together with experts like Dr. Mikki McComb-Kobza of Ocean First Institute, learning how to apply innovations in the field of robotics, such as remote sensing and robotic vision. You will help scientists restore ecosystems, reintroduce, and monitor native fish species.

Socially-Assistive Robotics(Spring): How can Robots help people? Embodied cognition is the joining of artificial intelligence with robotics. This class will explore this new and growing field by using IBM's Watson with NAO humanoid robots, Raspberry Pi and other hardware. We'll work with experts in the field to develop real-world applications for these technologies. Some experience with programming and/or robotics is helpful, but not required.

Email wilcox_nathan@svvsd.org with questions

Advanced Robotics: CTE83204: Spring

- Open to all 9-12th graders

This class prepares students to compete against other high school, community college and university teams from around the country and world in the 2020 MATE Underwater Robotics Competition. Our team will design, build, and test an underwater drone, and will also develop a marketing approach to sell our product. You will learn and apply engineering skills like computer-aided design, fabrication, electronics, programming and principles of aquatic physics. We will at a minimum participate in one regional competition in the US; if we qualify, we will travel to Monterrey, California in June 2020 to compete in the 2020 MATE International Competition.

Any student is welcome to enroll. The main requirement is a strong interest in learning something new, a firm commitment to the team, and committing to participating in the International competition in June if the team qualifies. Fundraising will be required in order to travel to events and acquire some of the course materials. Email wilcox_nathan@svvsd.org with questions.

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