K-1

Programming Your Story: Scratch Jr.

Calling all digital storytellers! This introductory programming and creative writing course is designed to challenge students to create stories using the Scratch Jr app. Students will explore the elements of storymaking while also learning programming logic.

Gee Gee Geometry

Captain Geo and his crew are stuck in Line land and they need your help to return to Space. When the journey begins the crew has been transformed into points or dots, no bigger than the head of a pin. Your task is to help the crew return to their spaceship and back to the World of Dimensions. Help Captain Geo and his crew find their way back home using tiles, cubes, puzzles, mirrors, and even marshmallows! You will use geo-boards to learn geometry through manipulation, improving visual thinking, spatial reasoning, and problem strategies. Design 3-D figures and create shapes and patterns from a variety of materials.

Crazy Wildlife Behaviors

Creatures do crazy things! Explore strange animal behaviors from shrimp creating sonic booms to goats who "play dead" when scared. Could plants ever eat animals? What would make an ant walk to death? Join us on a tour of our planet's biosphere to learn why different creatures have developed odd behaviors.

Traveling Paintbrushes

Engage in exciting art projects that range across many years! You will learn the basic techniques of painting in a multitude of ways. You will demonstrate creative self-expression and learn to identify different types of artwork. You will be introduced to different famous painters, learn about colors and how they mix, experiment with different media, and most important become educated painters!

Jr. Engineers

This introductory engineering applications course is designed to challenge students to create and complete tasks using materials, tools, and equipment such as cardboard, Little Bits electronics,
and Ozobot robots. Explore the basic principles of electronics using Little Bits and coding and robotics using Ozobots. Explore how circuits and structures are designed through fun projects that will make you look at everything around you as a potential building material. Join us for challenging activities that promote problem solving, collaboration, communication, and the engineering design process.

Story through Photos

Do you enjoy taking photos? Learn how to shoot photos that tell a story. We will explore how to capture beautiful landscapes, close-ups of objects, and family photos. You will apply your photography skills to design and create a story that you will tell through a series of photos. You are encouraged to bring your own camera, cell phone, or tablet to class.

Jr. Vets: Pet Care and First Aid

Do you love animals? Are you thinking about becoming a veterinarian? You will explore the characteristics and behaviors of dogs, cats, and other pets. Learn and practice giving emergency first aid as well as preventative care such as how to identify and prevent food poisoning, and many other techniques used by animal health professionals. You may be exposed to a trained, gentle dog or cat as part of the course activities. If you are allergic to or are afraid of dogs and cats (and other popular pets), you are discouraged from enrolling in this course.

How Space Works

Are you fascinated by the stars? Do you enjoy learning about planets and black holes? Find out the ingredients of comets, investigate the fury of Jupiter's Great Red Spot, and decide which solar system objects are the best candidates for discovering life. Join us for a tour of the universe as we explore the objects in our solar system and beyond.

Gr. 2-3

Mini Mogul

(formerly Shark Tank) You are the entrepreneur! Find a problem that you want to solve, or a want or need that you think should be served. Create your product or outline your service. Then develop a marketing plan for it and present it to a real panel of business experts. Learn the 4 P’s of marketing and how to pitch your product too.

Marvelous Machines

Do you enjoy watching a marble travel along a huge maze? Then you love Rube Goldberg machines, or complex contraptions used to perform simple tasks. Use the engineering design process and basic physics to plan and construct complex contraptions designed to achieve a simple task. Simple and compound machines are used to make tasks easier. Work individually and in teams to design, build, and problem-solve your own Rube Goldberg machines.
Digital Photography

“Smile!” This course will explore the techniques necessary to successfully take professional-quality photographs. Students will work collaboratively and individually to design, shoot, modify, and critique photographs of a variety of subjects in different settings. Digital cameras will be provided, however students are encouraged to bring their own digital cameras and accessories.

Superhero Science
Have you ever dreamed of swinging on a web like Spiderman, having the strength of the Hulk, inventing the gadgets that James Bond or Batman use in their fight against evil, or having superpowers like the Xmen or Iron Man? There are villains everywhere and now, more than ever, we need super heroes/ heroines! What would your superpower be? For what would you use your superpower(s)? What would be your identity/brand? Would you keep your identity a secret? Learn the science behind the powers of your favorite superheroes and create a superhero of your own!

Roller Coaster Design
Hold onto your seats! This is one fun ride! Roller Coaster Design guides you through a scientific mystery, set in an amusement park, where the rides are not working properly. You will learn about the major historical people and moments related to discoveries in the field of motion and gravity and apply that knowledge to solve the mystery. You will also use the laws of motion and gravity to design your own roller coaster!

Creature Dissections
We are looking for talented future medical professionals who love investigating the innards of different creatures! Explore how creatures function as we dissect various specimens. Students who may have difficulty with responsibly using tools to inspect creature organs are discouraged from enrolling in this course. Use your curiosity and scientific reasoning skills to gain a deeper understanding about animal anatomy, physiology, microbiology, and more!

Robotics and Engineering
Calling all tinkerers! This engineering applications course is designed to challenge students to create and complete tasks using robotics and engineering tools and equipment. Collaborate with your classmates to learn programming logic by creating color patterns that successfully tell your Ozobot robot to navigate a maze or complete an obstacle course. Explore how structures are designed through fun projects that will make you look at everything around you as a potential building material. Join us for challenging activities that promote problem solving, collaboration, communication, and the engineering design process.

Stories in 3D
Do you love pop-up books? If you do, you will use the mechanism of paper engineering (pop-up mechanism) to produce 3D stories which illustrate geometric concepts. The process of creating these 3D stories allows for writing plots, building imagery, and testing predictions. This approach transports you beyond the static 2D aspects of geometry and story-telling to a more dynamic, life-like world where characters and shapes "move" and "talk"!

Express Yourself

Everyone has the potential to speak effectively, evolve their own personal style, and develop poise and confidence when communicating with an audience. In American schools, in-class presentations are becoming increasingly central to academic success. This class provides fun and easy exercises to help you discover your “power voice” within and how the correct use of that voice can help make you an effective speaker in front of an audience.

Gr.4-5

Open Studio

Calling all creative thinkers! You will investigate color interaction, contextual relationships, conceptual and compositional strategies, and the relationship between subject, content, meaning, and process while working across various media. Learn how to produce high quality artistic works in pencil, watercolor, and other media. You are encouraged to print an Open Studio project in the 3D Print Lab course.

Architectural Design

This course is designed to introduce students to ideas, principles, and methods of solving architectural problems in a studio setting. You will explore the architectural concepts of space, form, function, and technology through exercises in the visualization and drafting of architectural objects and construction conditions. You will also investigate historic, geographic, demographic, economic, and sociological aspects of a given neighborhood. Leave the class with a project design of your own! You are encouraged to print an Architectural Design project in the 3D Print Lab course.

Business Design

The course is designed to expose the interested student to many functions of modern business using research and problem-solving skills. It will also expose you to the multitude of career fields in the areas of business. Topics such as business environment, management, organization, marketing, finance, accounting, and data processing are discussed in an introductory manner. If you're thinking about starting your own business in the future, this is the right course for you! You will learn everything from how to develop proven marketing techniques to traditional and nontraditional financing options.

3D Print Lab
Three-dimensional designs are revolutionizing how we solve problems. Work collaboratively and individually to develop an understanding of how form and design affects the function of 3-D printed objects. Challenge yourself and your classmates to design a solution for a current problem affecting society. You are encouraged to print projects from other courses such as Architectural Design and Open Studio.

Anatomy and Physiology

Do you wonder how our organs work? Have you ever wanted to see a real, mammalian brain? Join us as we work collaboratively to investigate the organs and systems of the human body and what happens to us when things go wrong. You will learn all about bones, muscles and many other interesting anatomical features of the body. Note this course includes the dissection of mammalian organs.

Marine Ecosystems

Do you love the ocean? Do whales fascinate you? Join us for an exploration of marine ecosystems around the world. You will work collaboratively and individually to investigate how marine ecosystems function with a focus on each ecosystem's food web. Learn why coral reefs are called "underwater rainforests" and share in the excitement of creatures who glow in the dark!

CSI Forensics: Cases

"We're crime scene investigators, please don't touch anything!" How do we scientifically determine who has committed a crime? You will work collaboratively and individually to understand and apply forensic science methods to specific cases.

Structural Engineering

Why are buildings one shape and not another? Why don’t bridges fall down? What forces are in play? Gain an understanding of the engineering and architectural concepts that surround us. Explore different types of structures, design considerations, and loads and forces. Students will work collaboratively and individually to take what they know from the world around them, expand upon their understanding, and then apply those concepts to the real world.

Mysteries of Explorers

This is a course guaranteed to fascinate and challenge both history and mystery lovers alike. Subjects covered include the disappearance of Amelia Earhart, the explosion of the Hindenburg, mysterious Stonehenge, the incredible conundrum of Princess Anastasia, the true meaning of the Wizard of Oz, and the Bermuda Triangle. You will investigate the most fascinating and thought-provoking events of all time. Armed with film, speculation and actual historical artifacts, this course promises to be an entertaining and unique opportunity to study, learn, and enjoy the pursuit of historical truth.
Effective Public Speaking

Introduces speechmaking based primarily on a traditional public speaking approach. Covers classical rhetorical theory and highlights rhetoric’s importance to public speaking. Develops theoretical understanding and practical application of oral communication skills. Includes techniques in controlling speech anxiety, how to structure and organize information to present to a variety of audiences, and physical and vocal delivery skills.

Courtroom Drama

Learn about the law and have fun, too! Plaintiffs and defendants. Witness testimony. Burden of proof. These are just a few of the legal terms students will learn. Find out about courtroom procedure from an insiders perspective. Write your own testimony as a witness, or prepare your opening arguments as an attorney. It’s all about knowing your audience, knowing your subject, and knowing yourself. Major courtroom dramas from 1950 to the present will be studied. Movie clips will be analyzed as expressions of American society’s quest for fairness and equality in the application of the law.

Gr. 6-10

Physics of Fluid Dynamics

You will apply fundamental physical concepts in fluid dynamics to a range of practical examples in this course, including free-surface flows, aerodynamics, stratified flows and gravity waves, convection and heat transfer, and physics of the greenhouse effect, and ocean-atmosphere coupling. Using scientific reasoning and analytical skills, you will also investigate and model flow behaviour. This course will focus on the physics aspect of fluid mechanics.

Engineering Fluid Mechanics

How do forces move on aircraft? How do the mass flow of petroleum run through pipelines? How to predict weather patterns? Come and develop an understanding of fluid dynamics in aerospace engineering as well as a variety of other fields! You will understand how fluids behave and predict the actions of moving fluids. Challenge yourself by engineering a Vortex Powered Jellyfish! This course will focus on the engineering aspect of fluid mechanics.

Living Organisms

Where do all the amphibians, reptiles, fish, birds, and mammals fit into the schemata of things? Scientists name and label every living organism. Students will identify those characteristics that are the basis for classifications from Domains to Species. A Russian Tortoise, Fire Belly Toads, and a Leopard Gecko will be on hand for observation. Labs will feature projects exploring photosynthesis, the interactive process between animal and plant kingdoms. This course is inspired by a profound love of nature. Family viewing of several animal nature films will be fully encouraged.
3D Architectural Visualization

Design 3D buildings! This course is designed to introduce students to ideas, principles, and methods of designing 3D spaces. You will explore the architectural concepts of space, form, function, and technology through exercises in the visualization and drafting of architectural objects and construction conditions. You will also investigate historic, geographic, demographic, economic, and sociological aspects of a given neighborhood. Leave the class with a project design of your own! You are encouraged to print a 3D Architectural Visualization project in the Advanced 3D Print Lab course.

Open Studio: Combined Media

Draw in 3-D and use combined media! Through a series of exercises, assignments, and visual presentations, you will learn the basic rules of creating perspective and how to accurately represent three-dimensional objects in a realistic space. You will also investigate color interaction, contextual relationships, conceptual and compositional strategies, and the relationship between (subject, content, meaning) and process. You are encouraged to print an Open Studio project in the Advanced 3D Print Lab course.

Robot Wars

Robots unite! This engineering applications course is designed to challenge students to build robots to compete against each other to solve problems or perform tasks. You will design, model, and build a functioning robot using Vex robotics. Individuals or teams will then compete for who can complete the given challenge efficiently and effectively. You and your classmates will critique each other's performance and work together to improve your designs.

Advanced Business Design

Make strategic analysis skills your business! In this course, you'll learn the statistical analysis tools to analyze operational business strategies across time (competitive dynamics), industries (corporate strategy), geographies (international strategy), and institutions (non-market strategy). Students will analyze the success and failure of large companies by exploring how advanced economic ideas were applied to inform critical decisions. Groups and individuals will be challenged to design or improve their own business including the presentation and peer critique of their strategic management and marketing plans.

Advanced 3D Print Lab

Three-dimensional designs are revolutionizing how we solve problems. Work collaboratively and individually to develop an understanding of how form and design affects the function of 3-D printed objects. Challenge yourself and your classmates to design a solution for a current problem affecting society. You are encouraged to print projects from other courses such as 3D Architectural Visualization and Open Studio.

Einstein's Astrophysics
When you look up at the night sky, do you wish that you had an ultimate telescope that could visualize different types of particles? Embark on a deep dive worthy of Einstein and Hawking, an intergalactic exploration from how stars and galaxies function to the theory of relativity. Discover how we have developed ways to observe the universe from telescopes to the Large Hadron Collider. Work collaboratively and individually to explore strange objects and analyze different types of processes. This course will encompass many advanced topics but will focus on particle physics and quantum mechanics.

G&T Debate

Prove you have what it takes to craft and deliver polished responses as part of the Gifted & Talented Debate Team! Verbal communication mastery is a highly valued skill. Work collaboratively and individually to practice your written and verbal communication skills. From doctors and lawyers to parents and politicians, your debating skills will serve you well.

K-10

So You Think You Can Act, Sing, and Dance

This is a course that is suitable for students of all levels who are interested in acting, singing, and dancing! Beginning students will discover their best singing voice and more experienced singers will gain an opportunity to exercise their vocal muscles through exploration of and experimentation in various vocal traditions. Beginning dancers will learn basic moves first in ballet, jazz, and tap, and can add on other styles including acro, hip hop, modern, musical and theatre. Advanced dancers will have fun creating original choreography. At the end, you will use your singing and dancing skills together to present a Broadway-style mini musical show!

Online Courses (Gr. 4-8)

The Architectural Experience

This conceptual architecture course will focus on introducing students to architectural patterns and techniques through activities, photos, and videos. Students may need to use common household items such as rulers, straws, and cardboard to complete their own architectural models. Successful students are those who enjoy finding patterns in data, who are observant and inquisitive, who are not afraid to actively contribute to scholarly discussions among peers, who have a strong command of written and verbal English, and who possess a sustained motivation to complete tasks on time. This course includes one hour of online discussion per week over the course of the nine-week session, so students will need Internet access to communicate via the Canvas learning management system.

Neuroscience

How does the human brain function? This biomedicine course will explore the anatomical components and the physiological functions of the human nervous system with a focus on the brain. Learning modules include photos and videos of dissected mammalian brains. Successful
students are those who enjoy finding patterns in data, who are observant and inquisitive, who are not afraid to actively contribute to scholarly discussions among peers, who have a strong command of written and verbal English, and who possess a sustained motivation to complete tasks on time. This course includes one hour of online discussion per week over the course of the nine-week session, so students will need Internet access to communicate via the Canvas learning management system.

**Chemistry of Food**

Do you see your kitchen as your lab? Work collaboratively and individually to explore the chemical reactions necessary for us to cook, eat, and enjoy our food. Discover what occurs at the molecular level when dough expands or a sauce thickens. Successful students are those who enjoy finding patterns in data, who are observant and inquisitive, who are not afraid to actively contribute to scholarly discussions among peers, who have a strong command of written and verbal English, and who possess a sustained motivation to complete tasks on time. This course includes one hour of online discussion per week over the course of the nine-week session, so students will need Internet access to communicate via the Canvas learning management system.

**Wild Weather**

Ever wonder how a thunderstorm can produce so much lightning? Do you enjoy measuring the snow whenever we have a winter storm? Then you will love the Wild Weather online course! We will be investigating how and why severe weather occurs with a focus on U.S. events. Students will be expected to record their own weather observations using common tools such as a plastic rain gauge and thermometer, and to regularly analyze maps, graphs, and charts of real, severe weather events. Successful students are those who enjoy finding patterns in data, who are observant and inquisitive, who are not afraid to actively contribute to scholarly discussions among peers, who have a strong command of written and verbal English, and who possess a sustained motivation to complete tasks on time. This course has been designed by Associate Director Chris Duvall, a severe weather enthusiast who earned his BS in Meteorology from The University of Oklahoma. This course includes one hour of online discussion per week over the course of the nine-week session, so students will need Internet access to communicate via the Canvas learning management system.

**AP Environmental Science and AP Psychology tutoring:**

Private, individual, online tutoring sessions will be held with an AP teacher for the ten weeks leading up to the 2017 AP exam administration in Canvas. (Weeks of 2/20/17-4/24/17) Students can sign up for five hours @$140/hr (total $700) or ten hours @ $120/hr (total $1200) of private review sessions to be scheduled between the student and the instructor. Students who are successfully enrolled will be contacted by their assigned instructor to choose days/times for the sessions, which will likely be scheduled as hourly sessions on weekday evenings between 7-10pm. Instructors will make every effort to provide sessions in a video conference format through Canvas. Students with slow connections may need to use the discussion board feature. Students are expected to attend sessions on time, to have access to an e-text or textbook that is commonly used for the course, and to regularly complete review tasks outside of the scheduled
tutoring sessions. While we cannot guarantee a given exam score, we can guarantee that our experienced AP instructors have a demonstrated history of teaching students who have scored a "5" on the AP exam.