Fairfax Collegiate
2026 Summer Program
Drones Course Syllabus
Rising Grades 7-9

Course Description

Pilot and program drones.

Fly small drones and complete obstacle courses, search and rescue missions, delivery simulations, photo and video assignments, and formation flying exercises.

Learn about FAA regulations. Program drones using a simple block-based language. Complete a multi-stage challenge requiring autonomous flight.

Students gain an introduction to drones and modern unmanned aircraft systems. Instruction blends guided practice and structured team challenges as students learn to pilot drones, support flight operations, and program autonomous behavior.

At the end of the course, instructors upload a collection of student photos and videos for families to access. Students leave with a strong foundation in drone piloting, safety, and coding, and the confidence to continue exploring aviation and autonomous systems.

Learning Objectives

Course Goals	**Getting Ready to Fly:** Students learn the basic physics of flight and are introduced to the components of unmanned aircraft systems (UAS). Students also study the current regulations governing drone use and the various degrees of airspace restriction. **Flying:** Students pilot a drone from the ground, practicing various maneuvers to perform an assortment of tasks. **Teamwork and Problem-Solving:** Students work together to complete an engineering challenge incorporating both controlled and autonomous flight. **Programming:** Students use the DroneBlocks interface as well as Arduino software to program drone flight paths and gather information about the environment.
Course	**Science of Flight:** Students learn how aircraft fly and the vocabulary for discussing various aircraft

Topics	systems. **Drone Safety:** Students learn procedures for safe drone operation in a classroom setting, as well as the regulations governing drone use more broadly. **Drone Piloting:** Students fly several configurations and models of drones, honing their skills by performing a variety of tasks. **Visual Observer Training:** Students practice using FAA guidelines to help support UAS pilots from the ground. **Search and Rescue:** Students work together to aerially seek out and retrieve items of interest. **Photography & Videography:** Students use drones' onboard cameras to take photos and create aerial video projects. **Autonomous Flight:** Students use the DroneBlocks app to code flight paths for the drones to follow without further human input. **Sensors / Electronics:** Students attach components to sense environmental data and report back findings to a receiver on the ground.

Course Schedule

Class Meeting 1	**Course Introduction:** Students are introduced to the instructor and the rules of the class. **What Is a Drone?:** Students learn about basic principles of physics related to flight, and are introduced to the different components of a small Unmanned Aircraft System (sUAS). **Flight Demo:** Students watch their instructor demonstrate safe operation of a micro-drone indoors. **Hello, Tello!:** Students are introduced to the drone models we will be using in class, and the various ways in which they will be controlled. **Drone Selfies:** Students use their drones' on-board cameras to take self portraits from a new point of view.
Class Meeting 2	**Take It Outside: Understanding Airspace:** Students learn about the different classes of restricted airspace, and how to determine where they are allowed to fly. **Fly the Friendly Skies:** Students learn to pilot a larger drone outdoors and soar to new heights. **Look, Up in the Sky: Visual Observer Training:** Students learn FAA guidelines to act as a visual observer assisting a drone pilot from the ground. **Drone On Your Own - Maneuvers Checklist:** Students fly on their own for the first time, practicing carrying out a series of different maneuvers.

Class Meeting 3	**Drone Search and Rescue:** Students work together as a search team to locate a toy "victim" and air-lift them to safety. **Short-Order Drones:** Students compete to complete a string of restaurant-style delivery orders via drone.
Class Meeting 4	**Video Pre-Production:** Students watch some examples of film scenes shot with drones, then brainstorm a class video project of their own. **Video Production:** Students assume different roles on a film set to bring their vision to life. **Video Post-Production:** Students review and edit their footage on a computer to create a finished film.
Class Meeting 5	**Scavenger Drones:** Students use their drones to look for a list of items, taking pictures as they find each one. **Hide and Drone Seek:** Students take turns finding hidden classmates via drone.
Class Meeting 6	**Introduction to Droneblocks:** Students use a simple block-based programming interface to code drone flight-paths wirelessly from their computers. **Pseudo-Swarms:** Students program a group of drones to fly in formation and create geometric figures.
Class Meeting 7	**Building Obstacle Course:** Students construct an obstacle course for their drones to fly through. **Introducing the Obstacle Challenge:** Students design a drone obstacle course, to be navigated both manually and autonomously.
Class Meeting 8	**Autonomous Flight Programming:** Students measure their course and create a program to navigate through it autonomously. **Autonomous Obstacle Challenge:** Students test their programmed flightpaths in a competition to navigate the obstacle course autonomously.
Class Meeting 9	**Tello EDU Python Programming:** Students write code in Python to program drone flightpaths. **Python Camera Commands:** Students write Python programs to take drone photos and videos. **Python Programming - Manual Control:** Students use Python to manually control their drone's flight from a laptop.
Class Meeting 10	**Drone On and On: The Future of Unmanned Aircraft:** Students discuss what they have learned in class and what the future may hold as drone technology develops. **Drone Picture Day:** Students use the Large Drone to take a final class photo.