



# Drones

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## Course Description

Drones capture stunning aerial photography, save lives in modern day search and rescue missions, collect snot samples from whales for scientific research, inspect vast agricultural landscapes, survey crocodile-infested waters, thrill spectators in FPV racing, bring medical supplies to war-torn areas and deliver pizzas in New Zealand. The world has fallen in love with them, and we're sure your students will too.

## Course Goals

In Discover Drones, your learning environment will experience first-hand the world's fastest-growing technology. Starting with **collaborative learning** and **scaffolded lessons** in engineering, **iterative design** and applied science, students begin by building RubiQ, their modular, open-source training drone. After learning the safety regulations and procedures surrounding unmanned aerial vehicles, they'll then start with the basics of flight, first becoming comfortable on a training simulator before moving onto line-of-sight piloting. After mastering RubiQ's controls, it's time for students to don their First-Person View (FPV) goggles for multiple extensions, experiencing exactly what super-charged **STEM** is like.

## Text and Reading Materials

All materials will be provided by the instructor

**State Standards:** This course is designed to meet the national and state standards for Science, Technology, Engineering and Math. It will also align with the ELA common core state standards.

## Required Supplies

- Notebook with standard or graph paper
- Pens and regular pencils

## Course Outline

- Essential Drone Knowledge
- RubiQ Drone Construction
- Wave Behavior and Electron Flow
- Laws, Regulations and Coordinating Groups
- Flight Simulator and Radio Controls
- Radio and Flight Controller Configuration
- Electrochemistry of LiPo Batteries
- Ethics, Drones and the Future
- Flight Safety
- Line-of-Sight Piloting Skills
- Motor and Sensor Calibration
- Balanced and Unbalanced Forces
- FPV Piloting Skills
- Bernoulli's Principle and Newton's Third Law
- Airfoils and Angle of Attack
- Racer's Mindset

## Course Schedule

This is a STEM course and will follow certain engineering requirements. Students will be assessed on design and proficiency of their robot and will also be required to meet deadlines and produce an engineering notebook that supports their team goals.

## Major Assignments

This is a project based course that will contain many small projects that will tie directly into some major projects. All projects will be assessed using a design process rubric. Students will be required to perform tasks such as presentations and demonstrations.

## Assessment Format

Assessment will be both formative and summative and based on quizzes, tests, presentations, and assignments amongst other methods.

## Classroom Expectations

- Students will be expected to adhere to all policies, procedures, and rules as outlined in their Grandview High School student handbook.
- Students will also be expected to adhere to the following classroom expectations:
  1. Be prepared—Bring proper materials, and study for tests, quizzes, etc.
  2. Be ready to learn—Be on time and in your seat when the bell rings ready to engage.
  3. Be respectful—Treat all staff, students, guest speakers, etc. with a great deal of respect. These individuals are vital to your success and are here to see all of you succeed.
  4. Be honest—Cheating, plagiarism, and other types of academic dishonesty will not be tolerated.
  5. Be helpful—Look for ways to help one another, and be a team player. Be a friend and help someone in need.

## Computer Use

- You will be responsible for adhering to all District, School, Department, and Classroom computer usage guidelines. Failure to follow those guidelines may result in the loss of your computer privileges.
- NO FOOD OR DRINK IN THE COMPUTER LAB!

## Absence and Tardy Policy

Attendance is mandatory. **If you are not in your seat when the bell rings you are considered tardy.**

## Grading Scale

Point Value	Letter Grade	High Percentage	Low Percentage
4.00	A	100.00	93.00
3.70	A-	92.99	90.00
3.30	B+	89.99	87.00
3.00	B	86.99	83.00
2.70	B-	82.99	80.00
2.30	C+	79.99	77.00
2.00	C	76.99	73.00
1.70	C-	72.99	70.00
1.30	D+	69.99	67.00
1.00	D	66.99	60.00
0.70	F	59.99	57.00

0.30	F	56.99	53.00
0.00	F	52.99	

### **Grading Policy**

- Student attendance, effort, attitude and other behaviors will be reported separately from achievement.
- Late work will not be marked down!!
- Students have a right to make up work missed due to absences.
- In the case of academic dishonesty student will be referred to the office to receive their consequence. Student will be given the opportunity to take the test over or receive a zero.
- Grades will be based on the achievement toward district course/grade level standards. Therefore, the grades will be organized and recorded by unit of study.
- Students will be able to track their progress through Skyward.

### **Caveat**

This is a general syllabus and cannot detail the entire scope of the curriculum. The instructor reserves the right to make adjustments or changes throughout the trimester to best fit the needs of students and classes.