Drone Course Syllabus
2019-2020 School
Year

Instructor: Mrs. Ver Steeg   **e-mail:** beverlyversteeg@misdmail.org
Conference: 10 am -10:45 am
After school availability: TBD
Tutoring time: By appointment before/after school

Course Name: Intro to Unmanned Aircraft System
Prerequisites: Must be 16 and have a valid Driver's license

COURSE DESCRIPTION:

Summary:
Students will be entering the world of UAS. In this class, we will discuss both large- and small-type UAS systems and the industries they are revolutionizing. Students will learn which UAS systems are best suited for different applications, and the performance characteristics that influence the utilization of these systems. Students will also learn about different sensor payloads, methods for determining the best application of sensor options, and how to analyze and differentiate the data collected. Students will participate in simulated UAS flights at the end of each class—working on their flight skills from the very beginning—and obtain beginner experience as sensor operators.

TOPICS COVERED
• Aerial Photography Introduction Techniques
• Utility Inspections Using sUAS
• sUAS for Use in Law Enforcement and Emergency Response
• Applications of sUAS Within Land Survey and Asset Management
• Basic-Level Flight Training with Simulators and Live Flight Aircraft
• FAA Rules and Regulations
• History of the UAS Industry
• Aerodynamics, Electronics, Software, and Hardware Basics

Disclaimer: This is an introductory course designed by Roscoe ISD's Innovation Team, Strat Aero, Collegiate Edu-Drone, Inc., meant to provide students with a broad introduction to UAS technologies and the industries in which they are used. All technologies outlined within are meant solely to provide a deeper understanding, leading to subsequent intermediate-level classes. Content is aligned to FAA regulations published on June 21, 2016. This course **does not guarantee** students will pass their FAA 107 Certification exam, nor does this content serve as a preparatory course for the FAA exam.

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Upon successful completion of the course, the student should be able to:

1. recognize and describe the role of unmanned aerial vehicles (UAVs) in past, present, and future society
2. comprehend and explain various components of UAVs
3. comprehend and explain basics of flight and flight control systems
4. understand and describe basic regulations applicable to UAV flight

GOALS AND OUTCOMES

Students will be able to describe and think critically about topics integral to UAS operations including:

• Different types of UAS systems and how each type can be used;
• Components of both fixed-wing and multirotor sUAS systems;
• Differences between firmware, software, and hardware in a UAS system;
• Basics of flight with multi-rotors and fixed-wings;
• Federal Aviation Administration (FAA) requirements for UAS operations; and
• The multiple industries for which UAS' can be used to improve operational efficiency and which type of UAS system is best used for a specific industry.

Students will accumulate up to 20-25 hours of live flight time on multi-rotors. Students will accumulate up to 20-30 simulated flight hours on both fixed-wings and multirotor systems.

PROJECTS

Students will take part in a solo and group project throughout the year.

UAS INDUSTRY APPLICATION PROJECT SUMMARY

Students will write a five-page report for a UAS system they can use for an intended application. This application can be any creative, commercial, or government use the student thinks of. Students will select their topic by the second week of the class and report their choice to the class instructor. Students will develop an Unmanned Aerial Vehicle (UAV) system, aircraft type, size, components, flight times, etc. Students must describe why their UAS system best fits their chosen application. Upon turning in their papers, students will give an eight-minute presentation to the rest of the class on their UAS and the application it is intended for.

CLASS AERIAL CINEMATOGRAPHY VIDEO PROJECT SUMMARY

Students will create a mini video of the class, involving aerial footage from a UAV. This video will be a controlled/guided project so that students are guided through the initial stages. Students will have the opportunity to direct and have a say in what the video should be like. The video, when finished, will be shown to the rest of the class.

ASSIGNMENTS

  ⑥ Pen (MUST use black or blue ink) daily.
  ⑥ Also a Pencil daily.
  ⑥ Assigned PC also must use (Canvas, on iPad at home).

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Materials to be Purchased by Parent / Student
2 rolls of transparent tape ¾" wide

ASSESSMENT POLICY – One (1) day= four (4) days of course work. Six weeks = 2 six weeks of work.

According to District Policy, a course's grading periods will be averaged together for 80% of the overall grade.
⑥ Major Project/Tests / Quizzes/ Eng. Notebook …………………………….…   40% ⑥ Daily /Classwork / Portfolio……………..……………………………...……….....   60%
NOTE: The final exam will represent 20% of course grade.

All STUDENTS ARE REQUIRED TO TAKE THE FINAL EXAM! NO EXEMPTIONS!
The district high school use a weighted numerical graded system. The following chart reflects the MISD grading system for grades 9-12.

A	90-100
B	89-80
C	79-70
F	70 -below

CLASSROOM RULES OF CONDUCT
1. No cell phones are allowed in class.
2. No drawing is permitted during lecture periods.
3. Food and beverages are not permitted in the classroom. This includes plate lunches, drinks, candy, etc., whether opened or not.
4. Class lab time is expected to be spent on lab work. Lab time is not free time. Attendance and concerted work on assignments are required. Work at home will be required in addition to work during lab times (work at home should not substitute for work during lab periods).

CLASSROOM EXPECTATIONS
1. **SIGN IN** at table by the door. This is how attendance is taken. It is your responsibility.
2. **Students are to be seated at the tables** when the bell rings and ready to start.
3. **ASSIGNED SEATS** – students must sit at their table and assigned computers and are not allowed to use other computers unless specifically directed to by the instructor.
4. **Backpacks, purses and other large items** must be in the assigned area (tables only not the computer area) for each student. This includes iPads, cellphones, and other electronic devices.
5. **Class participation** – Students are expected to activity participate in class daily. Passive learners don't learn much, you need to be actively involved in this class. This will show in your daily work (assignments) and also on Test and Quizzes.

6. **Missed Work/Assignments and Test** – It is your job to look on **Google Classroom** before you come back from missing this class, **before you come back to class**. That way you will know what you missed and many times can go ahead and do the work or at least start it. Please ask the teacher for anything you don't understand about the missed work/assignment when you return to class. **Keep in mind you are expected to already know what you missed. Must be completed ASAP.**

7. **Lab Safety / Health** – Students are expected to follow classroom rules, listen to and follow instructions (written and/or verbal), and use common sense when working in this class. More detailed information will follow as necessary.

8. **Out of respect** for our learning environment, YOU MUST silence your phone before you enter the class and place all electronic devices in your back pack, including iPad, phone, all ear buds (headphones) before entering. No phones should ever be seen or heard by the teacher in this class. During lecture and class discussions this is important to maintain necessary focus. BYOD Policy – Mansfield ISD has a BYOD policy in place; however, with access to computers in the classroom daily, **the use of cellular device is never allowed in** class.

Cell Phones
Having cell phones out in class (bell to entry classroom to the dismissal bell) will result in a disciplinary office referral. This includes the time for cleanup, just keep your phones put away until dismissed by the teacher.

- **iPad Classroom Rules**
- Make sure ear buds and headphones are put away and out of sight before entering the classroom.
- Put your iPad in your back pack before entering the classroom including all electronics.
- Make sure ear buds and headphones are put away and out of sight in your back pack before entering the classroom.
- Make sure the sound is off before entering the classroom and put away in back pack.iPads need to remain in your back packs. Never take iPads to the computer area. You will not use them in this classroom, so you will need to have in your backpack.

9. **Computers are to be left in the same configuration as found** (including screen background, etc.). Remember these are not your personal computers. A record is kept of your technology usages by way of Net Support and it records all activities on the computers.
10. **Outside storage** devices are not to be used in the B126 Computer Lab without the permission of teacher. Please don't bring memory sticks to class or ever put them into the computers.
11. **No food is allowed** in the computer lab. Only drinks with a screw cap is allowed at the tables.
12. **Printing** – Some assignments may be printed to a central network printer. Students should proof read work before printing. Any printing of items not pertaining to this class requires specific permission from the instructor.

13. **Worksheets** – Students will be given one copy of each worksheet and/or instruction sheet needed. The work is listed on **Canvas** for the schedule of the work and when the work is due. If the student loses the worksheet and/or instruction sheet, it is expected that the student reprints as needed whatever was lost, from Google Classroom on their own printer.

ABSENCES & TARDIES

All assignments will be accessible electronically on Canvas.com. It is your responsibility to get any information missed if absent on **Google Classroom** for this class. Because this course is condensed to three six weeks, all work will have a maximum late submission date which is the 10th class period late or before the six weeks has ended, whichever comes first. It is up to the student to get missed work completed on timely bases. Tardies: Students need to figure out how to get to class on time.

The district's policy is on the 4th tardy and every tardy after students will receive an office referral. BTW I follow this policy.

LATE WORK

This is an accelerated course. Assignment due dates are established. There will be a standard deduction of 30 point per class day for late work. **Most work is due at the very start of class. Work turned in the day due but after the start of class will be counted 30 points off. Teacher will assume you worked on this now late work during class.** It is important that you communicate any special circumstances regarding absences and late work to Mrs. Ver Steeg ASAP.

Lab safety/health

BE PREPARED. Read and fully comprehend the lab procedure as set forth in the lab manual before you begin any experiment. If you do not understand the procedure, see your instructor/TA.

THINK SAFETY. Work deliberately and carefully. No horseplay

ALL LABORATORY STUDENTS MUST BE SUPERVISED Never work alone

KNOW THE HAZARDS OF ANY MATERIALS OR MACHINERY YOU ARE WORKING WITH. The laboratory manual and/or instructor will review specific safety issues on individual experiments before you perform any tests.

ALL STUDENTS MUST WEAR APPROPRIATE SAFETY EQUIPMENT. Safety goggles must be worn anytime any laboratory experiment is being performed. Additional safety equipment must be utilized based on specific experiment requirements.

ALL STUDENTS MUST WEAR APPROPRIATE LABORATORY ATTIRE. No open toed shoes; no loose fitting clothing; Jewelry should be removed; long hair should be tied back

NO FOOD OR BEVERAGE IN THE LABORATORY.

KNOW EMERGENCY PROCEDURES. Make note of fire escape routes and emergency phone locations.

REPORT ANY PERCEIVED SAFETY HAZARDS. Immediately report any spills, equipment malfunctions, injuries or other perceived safety hazards to your Instructor / TA / or staff member.

KEEP YOUR WORK AREA CLEAN.

FAILURE TO CONFORM TO ANY OF THE ABOVE RULES MAY RESULT IN NOT BEING ALLOWED TO PARTICIPATE IN THE LABORATORY EXPERMENT.

Re-take Policy
- Students who fail a major test/assessment (below 70%) will be allowed to retake or correct up to a 70% grade. This does not include semester examinations.
- Students are expected to make arrangements with the teacher to retake or correct a major test/assessment.
- Students are encouraged to participate in tutoring opportunities before retaking a test.
- Each teacher will communicate routine requirements for retakes and corrections in his/her course syllabus.
- All retakes or corrections must be completed prior to the end of each six week grading period unless the student is afforded time, after the six week grading period, as a result of the district's absent/make-up guidelines.

Posting Student Work – Student grades will be posted in skyward parent portal within five business days for daily grades and major grades. Special consideration is given to major projects, including lengthy assignments.

ACADEMIC HONESTY & INTEGRITY
Honesty is always the best policy. Please, give me NO reason to suspect any form of cheating on work that is done in this course. While *working* with others on projects and assignments are allowed & encouraged, copying all or any part of any assignment is cheating and will result in a zero for the assignment, parent contact, and a referral to your assistant principal (per Student Code of Conduct).

Consequences for academic dishonesty
Daily Work
- Every Offense
    - Academic and Disciplinary Consequences
    - Assign grade of zero
    - Write a referral
    - Teacher contacts parents
    - Consequence from administrator would be a minimum of AC placement

Exams or Other Major Assessments
- Every Offense
    - Academic and Disciplinary Consequences
    - Assign grade of zero
    - Write a referral
    - Teacher contacts parents
    - Consequence from administrator would be a minimum of AC placement
    - An alternative exam or major assessment can be completed for a maximum grade of 70%
    - Academic Associate is notified and will schedule a meeting with student, parent and teacher
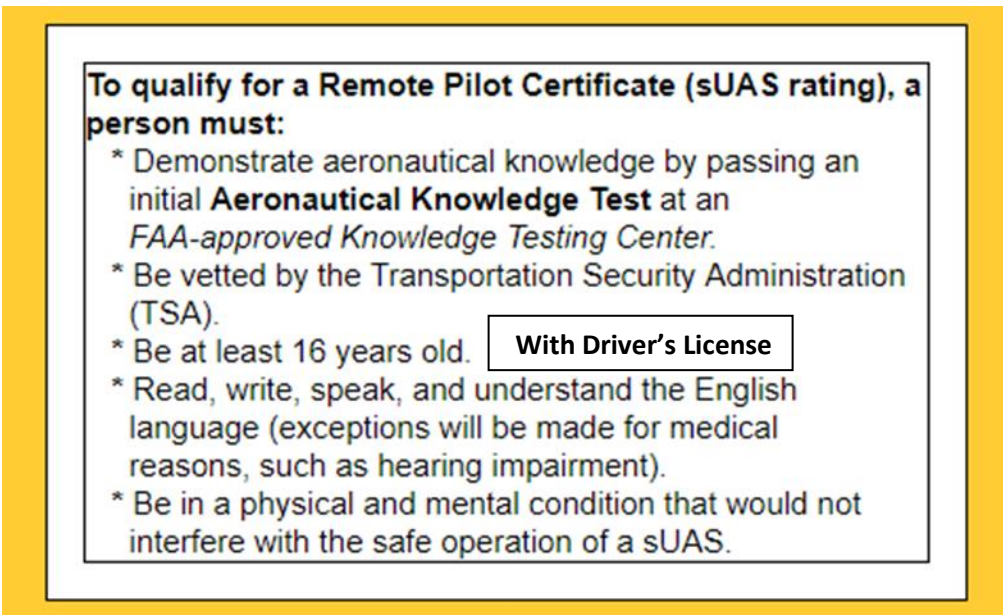
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DISTRICT POLICIES – The student and parent must sign the computer rules policy provided by the Mansfield ISD. All district and campus policies will be followed and enforced in this classroom. MISD and BBCTA/FHS policy will be followed in relationship to cell phones and electronic devices in the classroom.

KNOW THIS . . . You will be challenged each day to live your life with a purpose . . . so regularly ask yourself, "Do I know that my choices are affecting ME either positively or negatively and WHO I am becoming and who I will be in the future?"

<u>Teacher Provided:</u> **NEW** Composition Book Graph Ruled 9 ¾" X 7 ½" **(SPIRAL NOTEBOOKS ARE NOT ACCEPTABLE). You mess it up or loss it….you will need to buy a new one same size, etc… Calculator** – scientific with "sin, cos, tan" minimum OR a graphing calculator. Bring to class if you have one, **don't buy one for this class if you don't already have one**.

To qualify for a Remote Pilot Certificate (sUAS rating), a person must:
* Demonstrate aeronautical knowledge by passing an initial **Aeronautical Knowledge Test** at an *FAA-approved Knowledge Testing Center.*
* Be vetted by the Transportation Security Administration (TSA).
* Be at least 16 years old. **With Driver's License**
* Read, write, speak, and understand the English language (exceptions will be made for medical reasons, such as hearing impairment).
* Be in a physical and mental condition that would not interfere with the safe operation of a sUAS.

Certifications:
Remote Pilot Certification with the FAA

SUPPORTIVE MATERIALS:
Online Resources:
• http://www.faa.gov/
• http://www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak/
• http://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_107-2.pdf
• http://www.uavchecklist.com/
• http://candidate.catstest.com/sitesearch.php
• http://dronetraininghq.com/
• http://www.precisionhawk.com/lancaster
• https://3dr.com/
• http://www.dji.com/
• https://www.youtube.com/user/pilottrainingsystem/playlists
• www.m-w.com, Merriam-Webster's On-line Collegiate Dictionary & Thesaurus.

THIS IS YOUR LIFE . . .   Your one-and-only life on this planet. You determine what's possible. Make good choices, ask questions, think, and take positive steps – today is the day. Each day life offers itself to us in an endless number of ways. Each moment comes to us with both hands filled with gifts, marvels, opportunities and adventures – but we seldom see or accept more than a tiny fraction of the exciting possibilities around us. Let's be daring, be bold and be true to ourselves. Let's make the most of these opportunities to work together and to learn from each other.
All course assignments will be accessible on Canvas.com

  Room B126	**Mrs. Ver Steeg** Engineering Instructor & UAS Part 107 Certified Drone Pilot BEN BARBER Innovative Academy MANSFIELD, TEXAS *beverlyversteeg@misdmail.org* Updated 12/20/17

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STUDENT & PARENT SIGNATURE PAGE

UAS – B. Ver Steeg, Engineering Instructor
Due: _____

Please sign and return this packet after reviewing the Course Syllabus, Classroom Policies and the Mansfield ISD Acceptable Use Policy (AUP).

My child and I understand that he/she must comply with these regulations. We realize that if he/she fails to abide by the rules, he/she will adhere to the sanctions listed and will not be able to participate in this computer-based lab or regular classroom.

District policy states that every student will **wear** an ID and have a ***signed Acceptable Use Policy* (AUP)** on file every day to be able to access any MISD networked computer.

Your signatures below indicate that you have received, reviewed, and accept the course syllabus, classroom policies and the Acceptable Use Policy (AUP) of the Mansfield ISD.

Student's Name:_____

Student's Signature_____ Date:_____

Parent's/Guardian's Name:_____

Parent's/Guardian's Signature:_____ Date:_____

Grade Classification:_____

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* Be vetted by the Transportation Security Administration (TSA).
* Be at least 16 years old. **With Driver's License**
* Read, write, speak, and understand the English language (exceptions will be made for medical reasons, such as hearing impairment).
* Be in a physical and mental condition that would not interfere with the safe operation of a sUAS.

DRONE SAFETY CONTRACT

A safe operation policy is an integral component for the safe operation of a drone. The following pages contain basic operating policies and procedures to ensure the safe operation of commercial drones for company business. This policy focuses on the safety of student's, the public, and property owned by others. **Mrs. Ver Steeg** strictly adheres to Federal Aviation Administration (FAA) requirements governing remote pilots, equipment, and operational rules. The goal of this operational policy is to reduce or eliminate accidents, injuries, and property damage by following safe operating practices. This policy is provided so each student is aware of his or her responsibilities. Compliance with this program is mandatory for all student drone operators. Violations of this program may result in disciplinary action, up to and including suspension of drone operating privileges

General Responsibilities
You are responsible for ensuring that safety policies and procedures are established and enforced consistently, including using safety equipment and reporting defect or damage drones

Students are also responsible for:
• Maintaining drone's appropriate use to be performed
• Ensuring drones are properly maintained and safe for operation
 • Ensuring you understand school district safety policies and procedures
• Know the location of appropriate FAA registrations and insurance
• Ensuring the unmanned aircraft system weighs less than 55 lbs. (including payload) Remote pilots are responsible for following all FAA requirements, procedures, and company guidelines established in this Safety Policy. Pilots will also ensure the drone is properly maintained for safe operation and kept in a secure location when not in use.

Student Personal Use
Student Personal Use of Mansfield ISD drones and associated equipment will be assigned to each student for school-related purposes. Students will not allow any unauthorized individual to operate the drone.
If unauthorized use results in an accident, the Student may be required to make restitution for any damages. Additionally, disciplinary action may be taken.
Use of Mansfield ISD drones for personal or recreational purposes is strictly prohibited.

Remote Pilot Safety Rules
Students must operate the drone in a safe manner, adhering to federal, state, and local laws. Remote pilot safety rules include:
• Remote pilots are encouraged to read the owner is manual thoroughly to become familiar with all features, limitations, and recommended maintenance
• Be courteous and respectful to motorists, bicyclists, pedestrians, and school district property.
• Do not engage in distracting activities while flying the drone, such as talking on a phone, texting, eating, or any other activity that takes your attention away from operating the drone
• Do not operate a drone while attempting to drive a vehicle
• Do not allow unauthorized individuals to operate the drone on your behalf
• Do not operate the drone while impaired by alcohol, illegal drugs, medications, illness, or fatigue
• Do not operate the drone in or around natural disasters, emergency responses, or related situations
• Do not operate the drone in an unethical fashion

Pre-Flight Operational/Safety Check
The remote pilot will complete a pre-flight operational/safety check in accordance with the manufacturer's inspection procedures. The pre-flight check includes these visual and functional checks:
• Visual condition of the unmanned aircraft system components
• Airframe structure, including all flight control surfaces, lights, and linkages
• Registration markings for proper display and legibility
• Moveable surfaces, including airframe and attachment points
• Servo motor(s), including attachment points • Propulsion system, including power plant, propellers, rotors, and ducted fans
• Verifies all systems have adequate energy supply for the intended operation and are functioning properly (battery)
• Avionics, including control link transceiver, communication/ navigation equipment and antennas
• Calibration of the unmanned aircraft systems compass prior to flight
• Control link transceiver, communication/navigation data link transceiver, and antennas
• Display panel if used is operating properly
• Ground support equipment, including any takeoff and landing systems for proper operation

In-Flight Safety Rules

Fly the unmanned aircraft system during daylight hours unless a waiver has been obtained before the flight.
Maintain visual sight of the drone at all times unless a waiver has been obtained before the flight.
Do not fly the unmanned aircraft system higher than 400 feet above ground level unless flown within a 400-foot radius of a structure.
Maintain a minimum visibility of three statute miles from the control station location. Maintain a minimum distance of 500 feet below and 2000 feet horizontally from any clouds.
Do not fly the unmanned aircraft system over crowds of individuals unless a waiver has been obtained before the flight.
Do not operate the unmanned aircraft system from a moving vehicle unless a waiver has been obtained before the flight.
 Do not operate the unmanned aircraft system in a careless or reckless manner. Store the unmanned aircraft system in a secure, locked location when not in use.

Accident Reporting
- All incidents involving damage to the drone, property of others, personal injury to employees or others should be reported to management as soon as possible or within 24 hours.
- If an incident occurs, return the drone to the home location or turn the engine off and protect the scene to the best of your ability to prevent further damage/injury.
- Ensure medical attention is provided to any injured parties as quickly as possible.
- Notify emergency personnel or law enforcement in the event of an accident where injuries or property damage occurs.
- Gather as much information as possible about the accident and document facts using West Bend's General Liability Incident Report (WB2744) attached to this document.
- Gather witness statements as you are able, including name, address, and phone numbers.
- Take photos of damaged property and/or conditions contributing to the accident.

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In the event of an accident, the remote pilot is required to report any of the following to the FAA within 10 days of the accident:

 • Accidents involving serious injury or loss of consciousness
 • Damage to property, other than the unmanned aircraft, if the cost is greater than $500 to repair or replace the property, whichever is lower Completed accident reports are to be submitted to the FAA's DroneZone Portal at www.faadronezone.faa.gov/. Accident reports should include:

• The name and contact information of the remote pilot in command
• The airman certificate number of the remote pilot in command
• The unmanned aircraft system's FAA registration number

Student Agreement for Use

1. I have read and understand all of the rules and requirements for use of a company drone spelled out in the Drone Safe Operation Policy.
2. I agree to comply with all of the rules and requirements in the Drone Safe Operation Policy.
3. I will not use the School's drone for personal or recreational use.
4. I will not allow unauthorized individuals to operate the company drone.
 5. I agree to store the drone in a secure location when not in use.
6. I agree to report any incidents that occur while using the company drone to management as soon as possible or within 24 hours of occurrence.

Student's Name: _____

Student's Signature: _____

Date: _____

Violating any of these, policies will results in potential disciplinary action and loss of drone usage.