

Drone Cinematography

Level: 3

Career Cluster: Media Arts, Advanced Manufacturing

Program: Media Production and Broadcasting, Engineering

Pathway: Cinematography and Film/Video Production, Engineering Applications UAS

Educator and students must comply with FAA regulations. FAA 107 is required for commercial use.

Course Catalog Description

Introduces students to digitally based drone cinematography through aerial storytelling, safe and ethical flight, digital imaging workflows, software-supported planning, post-production, and industry-standard media production practices.

Summary

This course introduces students to drone cinematography as a digitally based tool for visual storytelling in film, video, and digital media. Students examine career pathways and professional roles, apply FAA safety, legal, and ethical requirements, and use digital preproduction workflows such as script analysis, storyboarding, shot planning, and production scheduling. Through hands-on practice, students develop controlled flight techniques, cinematic camera movement, composition, lighting, exposure, and image control skills while capturing, organizing, editing, and evaluating digital aerial media for different production needs. The course emphasizes professionalism, collaboration, digital asset management, post-production, and creative problem-solving as students create purposeful aerial imagery that supports narrative intent, continuity, audience engagement, and portfolio development.

Notes

The updated course reflects a shift from a primarily technical and flight-focused curriculum to a more comprehensive, industry-aligned media production course. The original course emphasized core drone operation skills such as basic flight control, safety procedures, aerial photography/videography techniques, and equipment handling. In contrast, the revised course expands these foundations by integrating drone cinematography into the full production workflow, including planning, shot composition, storytelling, and post-production applications. Additionally, the new version strengthens alignment with CTE expectations by incorporating structured components such as career exploration, portfolio development, leadership, work-based learning, and a final assessment project. These updates enhance the course by emphasizing creative application, professional practices, and real-world production readiness while maintaining essential technical drone operation competencies.

Student Learning Outcomes

1. Career Exploration and Postsecondary Opportunities

Objective: *Students will explore and evaluate career pathways related to digitally based drone cinematography and film/video production by examining professional roles, hardware and software tools, digital workflows, work environments, legal and ethical responsibilities, certifications, professional organizations, and Colorado postsecondary education options in order to make informed academic and career decisions.*

- 1) Identify employment opportunities in various fields with a focus in the area of cinematography and film/video production
 - a. Recognize the work typically performed, tools and technology used, and nature of work environments
 - b. Identify potential certifications within the careers
 - c. Find membership organizations associated with the careers
 - d. Understand the necessary education associated within the careers
- 2) Define professionalism within the context of cinematography and film/video production
 - a. Criticism and evaluation
 - b. Presentation
 - c. Assessment
- 3) Recognize laws, regulations, and ethics significant to the fields of cinematography and film/video production
- 4) Identify postsecondary opportunities offered in the state of Colorado
 - a. Technical college, community college, 4-year institutions
 - b. Certificates, associates, bachelor, and advanced degree opportunities

2. Foundations of Drone Cinematography and Visual Storytelling

Objective: *Students will analyze the role of drone cinematography in visual storytelling by examining the responsibilities of the Director of Photography, applying aerial perspectives to mise-en-scène, and evaluating how digitally captured drone imagery enhances narrative impact, continuity, and cinematic intention across film, video, and online media.*

- 5) Explain the role and responsibilities of the Director of Photography (DP) as they relate to aerial cinematography.
- 6) Describe how drone cinematography supports visual storytelling in film, video, and digital media.
- 7) Analyze mise-en-scène elements—including space, movement, scale, and perspective—using aerial viewpoints.
- 8) Evaluate when and why drone footage is used to enhance narrative impact, establishing shots, and visual continuity.

3. The Drone Cinematographer in the Production Process

Objective: *Students will plan aerial cinematography as part of a digitally based production process by analyzing scripts, breaking down shot requirements, designing*

digital storyboards and shot plans, and anticipating production challenges related to location, weather, safety, airspace constraints, file workflows, and delivery needs.

- 8) Analyze scripts to determine appropriate aerial shots, camera movement, and drone use for storytelling.
- 9) Break down scripts and shot lists to identify drone-specific needs, constraints, and opportunities.
- 10) Create storyboards and shot plans that incorporate drone movements and angles.
- 11) Predict potential production challenges related to locations, weather, airspace, or safety.

4. Drone Crew, Roles and Professional Set Protocol

Objective: *Students will apply professional drone crew structures and set protocols by analyzing production hierarchies, differentiating crew roles, selecting appropriate personnel for production needs, and demonstrating effective communication, professionalism, chain-of-command practices, and digital collaboration using shared production documents and media workflows.*

- 12) Explain how the drone cinematographer fits within the camera department and overall production hierarchy. (*Understand*)
- 13) Differentiate roles and responsibilities of drone-related crew members, including:
 - a. Director of Photography
 - b. Drone Pilot / Camera Operator
 - c. Visual Observer
 - d. Production leadership
- 14) Select and justify appropriate drone crew roles based on production scale and complexity.
- 15) Demonstrate professional set protocol, communication, and chain-of-command practices.

5. Drone Safety, Ethics and Legal Awareness

Objective: *Students will apply safe, ethical, and legally compliant drone operation practices by following pre-flight, flight, and post-flight procedures; making responsible decisions regarding people, property, and environments; and analyzing privacy, consent, data security, and regulatory requirements in digitally based aerial media production.*

- 16) Apply drone safety practices for pre-flight, flight, and post-flight operations.
- 17) Demonstrate responsible decision-making related to people, property, and environments during drone operation.
- 18) Analyze ethical considerations surrounding privacy, consent, and public spaces in aerial filming.
- 19) Explain the importance of legal and regulatory compliance for drone operations in media production.

6. Drone Operation and Flight Techniques

Objective: *Students will demonstrate controlled drone flight and camera movement techniques by executing smooth cinematic maneuvers, analyzing how motion supports storytelling and pacing, and applying flight choices that enhance audience engagement, visual clarity, and digitally recorded media quality.*

- 20) Demonstrate controlled drone flight maneuvers for cinematic purposes
- 21) Execute smooth camera movements including:
 - a. Static aerial shots
 - b. Tracking movements
 - c. Reveals and passes
 - d. Vertical and horizontal motion
- 22) Analyze how drone movement impacts storytelling, pacing, and audience engagement.

7. Lighting, Exposure and Image Control (Aerial Context)

Objective: *Students will analyze and apply exposure and lighting principles in aerial cinematography by managing metering, contrast, color temperature, camera settings, and environmental lighting conditions to maintain digital image consistency and create appropriate mood and tone in drone footage.*

- 23) Explain exposure concepts as they apply to drone cinematography.
- 24) Apply metering techniques and exposure controls to maintain image consistency during flight.
- 25) Analyze contrast ratios, color temperature, and natural light conditions from aerial perspectives.
- 26) Evaluate how light, shadow, and time of day affect tone and mood in drone shots.

8. Aesthetics, Composition and Motion Design

Objective: *Students will apply advanced compositional and motion-design principles to digital aerial imagery by controlling framing, aspect ratio, lens choices, movement, and coverage to reveal narrative development, support continuity, and enhance cinematic storytelling across digital distribution formats.*

- 27) Apply compositional principles—including rule of thirds, leading lines, symmetry, and balance—to aerial shots.
- 28) Analyze the impact of aspect ratio and framing choices in drone cinematography.
- 29) Select lenses and camera settings to control depth of field and perspective in aerial shots.
- 30) Evaluate how color, movement, and framing reveal narrative development through aerial imagery.
- 31) Capture appropriate aerial coverage to support continuity and editing.

9. Drone Gear and Cinematic Equipment

Objective: *Students will evaluate and select drone platforms and cinematic equipment by comparing camera systems, stabilization capabilities, sensor performance, recording*

formats, resolutions, codecs, storage needs, and the role of drones in relation to traditional and digitally based camera movement tools.

- 32) Identify and compare drone platforms and camera systems appropriate for different production needs.
- 33) Evaluate drone features including stabilization, sensor size, and flight capabilities.
- 34) Explain how drones complement traditional camera movement tools such as cranes, dollies, and handheld systems.
- 35) Select appropriate formats and resolutions based on delivery requirements.

10. Problem-Solving and Production Decision-Making

Objective: *Students will analyze and solve production challenges during drone cinematography by anticipating technical and environmental constraints, adapting shot plans safely and creatively in real time, and maintaining visual intent across digitally based production, capture, and post-production workflows.*

- 36) Anticipate technical, environmental, and logistical challenges prior to drone operation.
- 37) Solve production problems during flight using creative and safe alternatives.
- 38) Adjust shot plans in response to unexpected conditions while maintaining visual intent.

11. Portfolio Development and Presentation

Objective: *Students will develop and present a professional digital portfolio by curating aerial cinematography work samples, documenting production processes, reflecting on growth, and organizing digital artifacts that demonstrate technical skill, creativity, safety awareness, post-production ability, and readiness for postsecondary or career opportunities.*

- 39) Curate portfolio artifacts that demonstrate drone cinematography knowledge, technical skill, and creative growth.
- 40) Organize portfolio materials to include finished work, planning documents, reflections, and evidence of safe and ethical production practices.
- 41) Present and explain portfolio selections using appropriate industry vocabulary and self-assessment of strengths, challenges, and next steps.

12. Leadership

Objective: *Students will demonstrate leadership by applying communication, collaboration, initiative, responsibility, and ethical decision-making skills in classroom, production, CTSO, and digital collaboration contexts to support team success and personal career development.*

- 42) Demonstrate leadership skills through communication, initiative, accountability, and ethical behavior in production settings.
- 43) Collaborate effectively with peers by contributing to team goals, resolving challenges professionally, and supporting shared outcomes.

44) Participate in leadership experiences such as CTSO activities, project management roles, or peer mentoring to strengthen career readiness.

13. Work-Based Learning

Objective: *Students will connect classroom learning to industry practice by engaging in work-based learning experiences, professional interactions, and career preparation activities that build employability skills, workplace awareness, and understanding of digitally based drone cinematography careers and workflows.*

45) Participate in career-connected learning experiences such as guest speaker sessions, job shadows, client-based projects, internships, or mentorship opportunities.

46) Demonstrate employability skills including punctuality, communication, adaptability, and professionalism in authentic workplace contexts.

47) Reflect on work-based learning experiences to identify career interests, skill development, and goals for continued growth.

14. Final Assessment Project

Objective: *Students will complete a final assessment project that demonstrates cumulative learning by planning, producing, editing, and presenting a digitally based drone cinematography piece that applies safety, storytelling, technical production, post-production, and professional communication skills.*

48) Plan and produce a final drone cinematography project that integrates preproduction, flight execution, composition, and editing techniques.

49) Present the completed project with supporting documentation such as a shot plan, safety checklist, artist statement, or reflection.

50) Evaluate the final project using feedback, self-assessment, and project criteria to identify strengths and areas for improvement.

15. Career and Technical Student Organizations

Objective: *Using the [CTSO Resource Document](#), chapter activities will provide some of the best opportunities CTSO members will have to learn by doing. A successful [program of work](#) creates a positive learning atmosphere in the classroom. CTSO members learn how to accept responsibility, work as a team, manage a budget, and handle success and failure. Per the CTE Admin Handbook, CTSOs are embedded into curriculum.*

Professional Development

Prepare each member for entry into the workforce and provide a foundation for success in a career. Becoming a professional does not stop with acquiring a skill, but involves an increased awareness of the meaning of good citizenship and the importance of labor and management in the world of work.

Community Service

Promote and improve goodwill and understanding among all segments of the community through services donated by CTSO chapters, and to instill in its members a lifetime commitment to community service.

Business and Industry Connections

Increase awareness of quality job practices and attitudes, and increase the opportunities for employer engagement and eventual employment.

Financial Leadership

Plan and participate in activities to allow all members to carry out the chapter's projects. Educate members on their own personal finance for current and future success.

Public Relations

Make the general public aware of the good work that students in career and technical education are doing to better themselves and their community, state, nation, and world.

Social Activities

To increase cooperation in the school and community through activities that allow CTSO members to get to know each other in something other than a business or classroom setting.

Academic Standards Alignment

Colorado CTE courses are required to integrate academic and essential skills into course content. The following academic standards have been identified as aligned to this course and should be integrated throughout instruction.

[CO CTE Academic Standards Resources](#) (Rubrics, integration strategies, etc)

[CDE Colorado Academic Standards Online](#) (Online standards lookup tool)

Note: Mathematics and Science standards will be added in the future. Visit the [Colorado Academic Standards](#) page for the most current version.

Reading, Writing and Communicating Crosswalk

Course: Drone Cinematography

Colorado Academic Standards – Reading, Writing and Communicating

Standard	Prepared Graduate Competency	Description	Course Evidence / Alignment
Standard 1: Oral Expression and Listening	Prepared Graduate 1 – Collaboration	Collaborate effectively as group members or leaders who listen actively and respectfully; pose thoughtful questions, acknowledge the ideas of others; and contribute ideas to further the group's attainment of an objective.	Students collaborate in flight and production teams, follow verbal safety and operational cues, and participate in critique to plan and execute aerial cinematography projects.
Standard 1: Oral Expression and Listening	Prepared Graduate 2 – Oral Presentations	Deliver effective oral presentations for varied audiences and varied purposes.	Students present flight plans, shot concepts, safety briefings, and completed aerial video projects to peers and instructors.
Standard 2: Reading for All Purposes	Prepared Graduate 4 – Informational Texts	Read a wide range of informational texts to build knowledge and to better understand the human experience.	Students read and apply informational texts including FAA guidelines, airspace regulations,

			equipment manuals, safety protocols, and project briefs.
Standard 2: Reading for All Purposes	Prepared Graduate 5 – Language in Context	Understand how language functions in different contexts, command a variety of word-learning strategies to assist comprehension, and make effective choices for meaning or style when writing and speaking.	Students use precise drone, aviation, and cinematography vocabulary and adapt communication for safety, technical, and creative contexts.
Standard 3: Writing and Composition	Prepared Graduate 7 – Informational Writing	Craft informational/explanatory texts using techniques specific to the genre.	Students write flight logs, production notes, reflections, and documentation explaining aerial cinematography techniques and decision-making.
Standard 3: Writing and Composition	Prepared Graduate 9 – Writing Process	Demonstrate mastery of their own writing process with clear, coherent, and error-free polished products.	Students revise written documentation and refine shot plans and edits to produce clear, coherent, and professional-quality aerial media products.
Standard 4: Research Inquiry and Design	Prepared Graduate 10 – Research and Ethics	Gather information from a variety of sources; analyze and evaluate its quality and relevance; and use it ethically to answer complex questions.	Students research locations, airspace rules, cinematography techniques, and legal standards; evaluate sources; and apply ethical and safe drone operation practices.

Free Resource Links

1. Career Exploration and Postsecondary Opportunities

- My Next Move (drone pilot careers, cinematography roles, education pathways)
<https://www.mynextmove.org/>
- CareerOneStop – Drone and UAS Careers (certifications, training programs, career exploration)
<https://www.careeronestop.org/>
- Federal Aviation Administration – UAS Careers (aviation careers, drone industry overview)
<https://www.faa.gov/uas>
- Association for Uncrewed Vehicle Systems International (AUVSI) (drone industry careers, professional organizations)
<https://www.auvsi.org/>

2. Foundations of Drone Cinematography and Visual Storytelling

- StudioBinder – Aerial Cinematography Guide (visual storytelling, drone shot purpose)
<https://www.studiobinder.com/blog/aerial-cinematography/>
- No Film School – Drone Cinematography (narrative use of aerial shots, visual language)
<https://nofilmschool.com/>
- Film Riot – Drone Filmmaking (story-driven drone shots, visual impact)
<https://www.youtube.com/@FilmRiot>
- BBC Academy – Visual Storytelling (cinematography principles, storytelling techniques)
<https://www.bbc.co.uk/academy>

3. The Drone Cinematographer in the Production Process

- StudioBinder – Shot Lists and Storyboards (script breakdowns, storyboards, shot planning)
<https://www.studiobinder.com/blog/>
- Drone Film Guide (preproduction planning, aerial shot design)
<https://www.dronefilmguide.com/>
- No Film School – Preproduction for Drone Shoots (planning for locations, weather, airspace)
<https://nofilmschool.com/>
- Film Courage – Preproduction Planning (anticipating production challenges)
<https://filmcourage.com/>

4. Drone Crew, Roles and Professional Set Protocol

- FAA – Visual Observer Guidance (crew roles, professional flight operations)
<https://www.faa.gov/uas>
- Drone U – Professional Drone Crews (crew roles, communication protocols)
<https://www.droneu.com/>

- AUVSI Resources (professional standards, industry practices)
<https://www.auvsi.org/>
- StudioBinder – Film Crew Roles (production hierarchy, chain of command)
<https://www.studiobinder.com/blog/film-crew-roles/>

5. Drone Safety, Ethics and Legal Awareness

- FAA Part 107 Resources (drone regulations, safety, certification requirements)
https://www.faa.gov/uas/commercial_operators
- Know Before You Fly (drone safety, responsible operation, compliance)
<https://www.knowyourdrone.gov/>
- Drone Journalism Lab (ethics, privacy, public space considerations)
<https://dronejournalismmlab.org/>
- Aerial Law Blog (legal considerations, privacy, compliance)
<https://jrupprechtlaw.com/>

6. Drone Operation and Flight Techniques

- DJI Tutorials (flight control, smooth cinematography maneuvers)
<https://www.dji.com/learn-and-explore>
- Drone U – Flight Training (cinematic movements, control techniques)
<https://www.droneu.com/>
- Film Riot – Drone Movement Techniques (reveals, tracking shots, dynamic motion)
<https://www.youtube.com/@FilmRiot>
- SkyPixel Tutorials (aerial camera movement, cinematic flight paths)
<https://www.skypixel.com/>

7. Lighting, Exposure and Image Control (Aerial Context)

- DJI Camera Tutorials (exposure, ISO, shutter speed, color control)
<https://www.dji.com/learn-and-explore>
- No Film School – Drone Exposure Tips (lighting challenges, outdoor cinematography)
<https://nofilmschool.com/>
- StudioBinder – Exposure and Lighting (managing light for cinematic shots)
<https://www.studiobinder.com/blog/>
- FilmConvert Blog (color, exposure, aerial image consistency)
<https://www.filmconvert.com/blog/>

8. Aesthetics, Composition and Motion Design

- StudioBinder – Composition Rules (rule of thirds, leading lines, balance)
<https://www.studiobinder.com/blog/rule-of-thirds/>
- SkyPixel Inspiration Gallery (aerial composition, creative framing)
<https://www.skypixel.com/>
- No Film School – Aerial Composition (framing, motion design, continuity)
<https://nofilmschool.com/>

- BBC Bitesize – Cinematography Composition (visual composition principles)
<https://www.bbc.co.uk/bitesize>

9. Drone Gear and Cinematic Equipment

- DJI Product Knowledge Base (drone platforms, sensors, stabilization systems)
<https://www.dji.com/products>
- BandH Drone Buying Guides (camera systems, formats, resolutions)
<https://www.bhphotovideo.com/>
- Aerial Media Pros (professional drone gear comparisons)
<https://www.aerialmediapros.com/>
- No Film School – Drone Gear Guides (equipment selection for productions)
<https://nofilmschool.com/>

10. Problem Solving and Production Decision-Making

- Drone U – Mission Planning (adapting to weather, technical constraints)
<https://www.droneu.com/>
- Film Courage – Creative Problem Solving (decision-making under pressure)
<https://filmcourage.com/>
- No Film School – Production Challenges (on-set problem solving, adaptability)
<https://nofilmschool.com/>
- StudioBinder – Creative Constraints (maintaining visual intent under limitations)
<https://www.studiobinder.com/blog/>

11. Portfolio Development and Presentation

- Drone Film Guide (portfolio-quality shot ideas, cinematic planning, creative growth)
<https://dronefilmguide.com/>
- Frame.io Blog – Showreels (video portfolios, demo reels, feedback and revision)
<https://blog.frame.io/>
- Adobe Portfolio (professional portfolios, presentation of creative work)
<https://portfolio.adobe.com/>
- Canva Presentation Templates (portfolio presentation, visual organization, student showcases)
<https://www.canva.com/presentations/templates/>

12. Leadership

- MindTools – Leadership Skills (communication, teamwork, decision-making)
https://www.mindtools.com/pages/main/newMN_LDR.htm
- SkillsYouNeed – Leadership (conflict resolution, collaboration, professional behavior)
<https://www.skillsyouneed.com/lead/>
- TED Talks – Leadership (leadership perspectives, communication skills)
<https://www.ted.com/topics/leadership>

- National Society of Leadership and Success (leadership development, goal setting)
<https://www.nsls.org/>

13. Work-Based Learning

- CareerOneStop – Work-Based Learning (internships, apprenticeships, career exploration)
<https://www.careeronestop.org/ExploreCareers/learn/work-based-learning.aspx>
- Colorado Work-Based Learning (state guidance, employer connections, WBL models)
<https://cdle.colorado.gov/work-based-learning>
- ACTE Work-Based Learning Resources (career readiness, employability skills)
<https://www.acteonline.org/professional-development/work-based-learning/>
- AUVSI Workforce Development (drone careers, training pathways, industry connections)
<https://www.auvsi.org/workforce-development>

14. Final Assessment Project

- PBS LearningMedia – Media Production Projects (project ideas, assessment, rubrics)
<https://www.pbslearningmedia.org/>
- Film Riot (YouTube) (project-based drone filmmaking, production techniques)
<https://www.youtube.com/@filmriot>
- SkyPixel (aerial project inspiration, professional drone showcases)
<https://www.skypixel.com/>
- Rubistar (project rubrics, assessment tools)
<https://www.rcampus.com/rubistar/>



Technology Student Association – National Competitive Events

Digital Video Production

Objective: *Students will plan, produce, document, and present an original digital video that meets TSA Digital Video Production requirements for storytelling, technical production, copyright compliance, and interview presentation.*

- Research the annual TSA Digital Video Production theme and develop an original video concept.
- Analyze the story, audience, purpose, visual style, and production needs before filming.
- Create a hand-sketched storyboard and digital video script that guide the production process.
- Capture and edit original video using appropriate cinematography, camera movement, lighting, sound, and visual composition.
- Document the production through a portfolio that includes the purpose, self-evaluation, storyboard, script, hardware/software list, references, permissions, consent forms, and work log.
- Submit a video URL and documentation portfolio according to TSA competition procedures.
- Participate in an interview explaining the video concept, production process, technical decisions, and creative choices.

Resources

- Technology Student Association – Digital Video Production competition guidelines
<https://tsaweb.org/competitions-programs/tsa/themes-problems>
- Adobe Premiere Pro – Video editing and production tools
<https://www.adobe.com/products/premiere.html>
- YouTube Creator Academy – Video production and storytelling resources
<https://www.youtube.com/creators/>
- Purdue OWL – Copyright, citation, and media documentation resources
<https://owl.purdue.edu/>



Technology Student Association – National Competitive Events

On Demand Video

Objective: Students will work as a production team to create, edit, and submit an original short film during an on-site TSA challenge using required criteria revealed at the event orientation.

- Analyze the on-site video prompt, required criteria, filming restrictions, deadline, and submission procedures.
- Plan a short film concept that incorporates the required props, dialogue, topic, idea, or other event criteria.
- Assign production roles related to directing, cinematography, camera operation, editing, sound, and file submission.
- Film original footage only in approved conference locations while following TSA conduct and filming restrictions.
- Edit the footage into a complete video no longer than the TSA time limit.
- Submit the completed video hyperlink and required copyright checklist according to event procedures.
- Evaluate the final film using TSA criteria for creativity, communication, production quality, adherence to requirements, and overall impact.

Resources

- Technology Student Association – On Demand Video competition guidelines
<https://tsaweb.org/competitions-programs/tsa/themes-problems>
- Adobe Premiere Pro – Video editing tools
<https://www.adobe.com/products/premiere.html>
- DaVinci Resolve – Video editing, color, audio, and post-production tools
<https://www.blackmagicdesign.com/products/davinciresolve>
- Canva – Storyboarding, planning, and production graphics
<https://www.canva.com/>



Technology Student Association – National Competitive Events

Drone Challenge (UAV)

Objective: *Students will design, build, document, test, fly, and present an open-source UAV drone that meets TSA Drone Challenge requirements for safety, flight performance, documentation, and mission completion.*

- Research the annual TSA Drone Challenge specifications, mission requirements, safety expectations, and applicable drone regulations.
- Design or modify an open-source UAV drone that meets TSA requirements for size, motors, propellers, guards, payload, camera, and mission function.
- Assemble and configure drone components, including motors, flight controller, electronic speed controllers, camera, antenna, and related systems.
- Document the UAV through a portfolio that includes photo logs, wiring schematics, programming explanation, engineered drawings, bill of materials, and work log.
- Test and troubleshoot the drone during setup, safety inspection, flight practice, and mission preparation.
- Complete the timed flight challenge according to TSA procedures.
- Participate in an interview explaining the drone design, components, programming, safety decisions, and mission performance.

Resources

- Technology Student Association – Drone Challenge (UAV) competition guidelines
<https://tsaweb.org/competitions-programs/tsa/themes-problems>
- Federal Aviation Administration – Drone safety and regulations
<https://www.faa.gov/uas>
- ArduPilot Documentation – Open-source autopilot software
<https://ardupilot.org/>
- PX4 Autopilot User Guide
<https://docs.px4.io/>