5th CSU 3D-Printed Fixed-Wing Aircraft Competition (C-3DPAC)

Jesse Owens Field, Cal State LA (TBC)

Los Angeles, California

May 29, 2027

Organized by: Cal State University – Los Angeles

Competition Rules

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Rev 1. MT 2026/09/16

Changes & Corrections

This section to be used in future revisions.

- Rev 1. Update from 2026 rules. (9/16/2026)

Rev 1. MT 2026/09/16

Event Description

California State University, Los Angeles (Cal State LA) will host the 4th CSU 3D-Printed Fixed-Wing Aircraft Competition May 29, 2027, at its Jesse Owens Track and Field Complex on campus.

This competition challenges students to

- Develop a lightweight, 3D printable airframe
- Integrate design and manufacturing to maximize performance
- Design within 3D printing process and material constraints
- Leverage direct digital manufacturing technologies

Community Forum

As we did in 2025-26, Cal State LA is creating an online space for both the C-UASC and C-3DPAC competitions on Discord! The space will serve as a means to communicate directly with teams and members, to discuss potential rule changes and clarify any questions teams may have. You can join the space through this link: https://discord.gg/6txvXNzfWq, or through the link on the university webpage https://www.calstatela.edu/ecst/uav-competitions.

Registration and event details:

https://www.calstatela.edu/ecst/aircraft-competition

- Pre-Registration Opens: September 15, 2026
    - Sign up for competition information and access to sponsored design software
- Registration Opens: November 1, 2026
    - Provide information about team, aircraft and related items.
- Registration deadline: February 1, 2027
- Design Competition Submission deadline: May 1, 2027
- Flight Competition Eligibility Evaluation: May 29, 2027 (before event)
- Flight Competition: May 29, 2027, 9:00 a.m.
- Flight Competition location: Jesse Owens Stadium and Jesse Owens Track and Field, Cal State LA.

Awards:

The CSU 3D-Printed Fixed-Wing Aircraft Competition is composed of two parts; a design competition (optional and a flight competition. Each will be judged and awarded independently.

- Design Competition: Most Innovative Design
- Flight Competition: Longest Duration Flight

Awards will be non-monetary

Rev 1. MT 2026/09/16

Aircraft Rules

(COMPONENTS) 3D-Printed Construction

- All airframe components, including all aerodynamic surfaces and control surfaces, must be printed using purely (not hybrid) 3D printing technology. This includes the spars in the wings.
- For safety reasons, propellers and rotors should be commercial off-the-shelf hardware.
- Assembly hardware, hinges, actuators, systems components, etc. do not need to be 3D printed.
- Tape may be used as a mechanical device (e.g., a hinge) but not as structural attachment at a joint.
- Weights can be added to balance the aircraft.
- Epoxy or glue may be used as part of the assembly process of the 3D-printed pieces, but the structure may not be reinforced by the application of a layer of epoxy or glue,

(CONFIGURATION) Size-Weight and Material Restrictions

- Aircraft must comply with FAA regulations. Title 14, Part 7 – Small Unmanned Aircraft Systems. This imposes a limit of 55 lbs. It is expected that the model aircraft in this competition will be substantially smaller. The typical winners have been planes of less than approximately 3.0 lbs.
- There are other no size, configuration, weight, or material restrictions except that no lighter-than-air methods may be used (e.g., no helium).
- The aircraft shall be fundamentally safe. No hazardous configurations or materials may be used.

(POWER & CONTROL) Aircraft Power/Control Limitations

- Aircraft may be unpowered, or they may be powered with a motor and propeller.
- Rocket motors, external flames, and compressed gas (e.g., CO2) canisters are not permitted.
- Aircraft may be powered for a maximum continuous duration of 8 seconds (i.e., no pulsing or intermittent operation). A flight that exceeds this duration will be disallowed.
- Aircraft may be controlled or uncontrolled. Flights must operate safely within a 300 x 160-foot area (i.e., soccer field) and remain under 35 ft. A flight attempt in which an aircraft violates these boundaries for a duration longer than 3 seconds (per event, not cumulative) will be disallowed.

Competition Rules

Team Composition and Size

- Teams are composed of students from colleges or universities.
    - Teams from clubs or institutions other than colleges or universities may be able to enter but approval by competition organizer is necessary.
- Teams will be organized into three categories:
    - Development Team
    - Competition Team

- Competition Guests

Development Team

The development team must be composed of undergraduate or graduate students enrolled full time during at least one of the preceding Fall, Spring or Summer terms at an accredited college or university. The team must have at least one student from the school being represented and may have students from other schools. A school may have multiple teams, but a student may only be on one team. There are no limits to the number of students on the Development Team. Advisors may advise more than one team.

Competition Team

The team of students which participate in the flight competition comprise the Competition Team. Advisors are not counted for purposes of this limit.

Key Competition Team Members

Team Captain

One member of the competition team will fill the role of team captain during the competition year. This student will be the primary point of contact for the judges. All questions, comments, statements, and deliverables must be submitted by the team captain. The judges must be immediately notified of any team captain change.

Advisor

Each team must have a school faculty member/advisor or official point of contact (POC) from the team's school. Teams whose entire team is of the age of 18 years or above are not required to have the advisor or school official travel with the team, otherwise at least two adults shall travel with the team and shall take full responsibility for the students. The advisor will be permitted to observe the team at the flight line but is forbidden from assisting the team during setup, mission, or tear down. While the advisor may teach concepts, answer questions, provide high-level guidance, and review deliverables before submission, the students must design, manufacture, and operate the system on their own and must produce all deliverables on their own.

Team Pilots

Any member of the Competition team that will control a sUAS flight, for test or for competition, at the competition site will be deemed a sUAS pilot.

- sUAS pilots must have completed the certificates specified on the registration form.

Competition Guests

Each team will be allowed to bring additional guests to the competition. If desired, these guests may be development team members, but they cannot assist with the flight competition.

Flight Competition

- Aircraft must be presented for eligibility evaluation between 8:00 and 10:00 a.m. on the check-in date prior to the competition.

- Aircraft must be launched by hand or takeoff under their own power. Catapults or other launching devices may not be used.
- Timing starts when the aircraft is no longer in contact with the ground or the hand that launches it and stops when any part of the aircraft touches the ground.
- Teams are allowed 3 flight attempts with the best flight time recorded as the official time. Aircraft that are not ready to fly at the appointed time will forfeit that flight attempt.
- Aircraft repair is allowed between flights using adhesive and 3D printed components but not tape or other non-3D printed repair methods. Teams may use multiple aircraft of identical design and fabrication across flight attempts. Aircraft must be flown in the same configuration for each flight.
- Timing and judging will be performed by a panel of faculty and industry professionals that will have sole and final authority and discretion for verifying eligibility, measuring performance, evaluating safety, and resolving disputes.
- Any protests regarding aircraft or flight validity must be made in a timely manner.

Design Competition (Optional)

- All design competition entrants must also be entrants in the Flight Competition.
- All design, analysis, and fabrication of the competition entry is the sole responsibility of the student development team members. All design work must be performed by members of the development team.
- Students may only participate on a single team. Faculty advisors may advise more than one team.

Award Distribution

- Awards are non-monetary.
- Each team must register at https://www.calstatela.edu/ecst/aircraft-competition by the registration deadline.
- Each team must complete the submission details at https://www.calstatela.edu/ecst/aircraft-competition by the submission deadline to be eligible for the Most Innovative Design Prize.
- Design Innovation Awards are based on submitted design reports received before the published submission deadline following the template provided at the competition website.

Entry Checklist, Insurance, and Indemnification

Every team participating must fill out an entry form. In the event of multiple teams registering from the same institution, each must complete its own registration and include all the attachments.

Each entry must include the following information.

- Compliance with Insurance Requirements[1]
- Indemnification[2]

[1] specified in California State University, Los Angeles, Unmanned Aircraft Systems Guidelines (Will be available on competition webpage.)

[2] specified in California State University, Los Angeles, Unmanned Aircraft Systems Guidelines (Will be available on competition webpage.)

- Names of Students on Team
- Names of Advisors supporting Team
- Names of Students who will pilot the aircraft
- Pilot's FAA Certificate[3]
- Aircraft (FAA) Registration Number[4]
- Description of Aircraft (including dimensions, weight, owner information, etc.)

The registration form asks for the purpose of the event and the dates of the event. This will be pre-filled by Cal State LA. The purpose of the registration is to participate in the CSU 3D-Printed Fixed-Wing Aircraft Competition on May 29, 2027

Insurance through Academy of Model Aeronautics

- sUAS pilots can satisfy their insurance requirements by being members of the Academy of Model Aeronautics. https://www.modelaircraft.org/membership/enroll
- Membership numbers will have to be provided and will be verified.

[3] specified in California State University, Los Angeles, Unmanned Aircraft Systems Guidelines (Will be available on competition webpage.)

[4] FAA Drone Registration Link, https://faadronezone-access.faa.gov/#/