

Rocket Science B/C 2026-2027

1. **DESCRIPTION:** Participants will be assessed on their knowledge of introductory rocketry principles.

A TEAM OF UP TO: 2

APPROXIMATE TIME: 50 minutes

2. **EVENT PARAMETERS:**

- a. Each team may bring one three-ring binder of any size containing information in any form and from any source, attached using the available rings. Sheet protectors, lamination, tabs, and labels are permitted. Participants may remove information or pages for their use during any part of the event.
- b. Each team may bring up to 2 calculators of any type.

3. **THE COMPETITION:**

- a. Teams will be given a minimum of 40 minutes to complete a written test consisting of multiple-choice, true-false, calculation, and/or free-response questions.
- b. The test will consist of questions from the following areas:
 - i. Kinematics and Dynamics: Newton's laws of motion applied to spacecraft, spacecraft flight trajectories, flight data analysis, aerodynamics, and flight stability
 - ii. Fluid Systems: Fluid components (valves, tanks, etc.), plumbing and instrumentation diagrams, fluid statics, and fluid dynamics (pipe flow, compressible and incompressible flow, etc.)
 - iii. Guidance, Navigation, and Control: Fins, reaction control systems, thrust-vector control, and attitude and position analysis
 - iv. Orbital Mechanics: Kepler's laws, orbital paths, and maneuvers
 - v. Propulsion: Propulsion methods, C-D nozzles, rocket engine components, engine performance, and engine cooling
 - vi. Avionics: Electronics, sensors, power systems, and telemetry
 - vii. History: Space exploration history, relevant organizations, and current events
- c. Questions will range from straightforward recall (e.g., identifying fluid system components) to applied problem solving (e.g., computing velocity change using the rocket equation, comparing propulsion methods for a mission, analyzing simulation data).
- d. Calculation questions will not require calculus.

4. **SCORING:**

- a. Highest score wins.
- b. Points will be awarded for the quality and accuracy of responses.
- c. Selected questions or sets of questions may be used as tiebreakers.

5. PREPARATION:

- a. This event is intended to serve as an introduction to aerospace engineering. To that end, it assesses a breadth of topics rather than focusing on high technical depth in one field.
- b. Sample exams:
 - i. UT Austin Fall 2025 Invitational
 - ii. UT Austin Spring 2026 Regional