

JAKE CARDWELL

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Education

Purdue University | West Lafayette IN

Bachelor of Science in Aeronautical Engineering

Expected Graduation: May 2026

Semester Honors

GPA 3.6 / 4.0

Technical Skills: Siemens NX, SolidWorks, Fusion360 CAM, SimScale, Python, Matlab, WIG welding, Excel

Relevant Coursework: Aerospace Design, Aeromechanics, Thermodynamics, Structures and Materials, Data Analysis, Fluid Dynamics, Signal Analysis

Experience

Rainmaker Technology (*Systems Engineering Intern*)

May 2025 – Aug 2025

- Designed and integrated the compressor impeller for the aerosol dispersion system on UAVs, now implemented on ~120 drones for an active seeding project.
- Coordinated with manufacturing vendors, providing detailed aerospace-grade technical drawings with the implementation of GD&T and tolerance specs for a \$60K production order.
- Built and validated multiple aerosol test stands using 3D printing and precision components (McMaster-Carr and Amazon) to support rapid iteration.
- Contributed ~10 hrs/day in a fast-paced startup environment, supporting full system prototyping, testing, and deployment.

PSP - Purdue Hybrids Rocket Team (*Propulsion Engineer*)

Sep 2024 – May 2025

- Designed and manufactured aluminum rocket components using Fusion 360 CAM to support a 15-ft rocket project targeting 50,000 ft altitude for Purdue Space Program's hybrids team.
- Facilitated PDR and CDR presentations with seasoned aerospace engineers, ensuring project milestones and compliance.
- Developed simulation models, including fuel grain decay, to optimize rocket performance.

Portland Van (*Sprinter Racks Manufacturer*)

July 2020 – Jan 2024

- Helped maintain a small business of sawing, welding, and powder coating aluminum tubes to be mounted on Sprinter Vans as front facing racks.
- Facilitated connections between companies for powder coating and laser cutting.
- Sold the company for \$50,000 for use of remaining inventory, brand name, and website.

Projects

Purdue SLICE (*Spaceflight Liquid Interactive Control Experiment*)

August 2025 - December 2025

- Engineered the CAD system for a human-tended, zero-gravity flight experiment in collaboration with Virgin Galactic, being incorporated on the new Purdue One spaceflight research initiative.
- Automated a 300 mL flow-through system using Arduino-based control, optimizing pump performance.
- Conducted FEA for composite structures to determine optimal material for test vessels.

Senior Design (*Design Build Fly*)

August 2025 - December 2025

- Co-led CAD design and implementation of a remotely piloted fixed-wing aircraft, optimizing for structural integrity, weight distribution, and manufacturability within a 75×75×150 cm volume constraint.
- Spearheaded avionics integration and placement strategy, ensuring IMU alignment, minimizing electromagnetic interference, and balancing component locations for stable flight control.
- Performed structural, stability, and aerodynamic analysis including wing loading, shear/bending moment calculations, and CG placement to meet mission constraints

Golf Cart

June 2024 - August 2024

- Through collaboration with a long distance partner and incorporating the Engineering design process, created a remote controlled golf cart through a combination of hardware and software development.
- Utilized knowledge of machining and 3D printing to design and construct remote and body for the cart
- Using C++, Arduino microcontrollers, motor drivers (BTS7960), nRF24L01 wireless radio transceiver, and additional motion tracking sensors, communication and movement was achieved.

