

# Joshua Cowell

910-660-6996 • Lynchburg, VA • joshuacowell2005@gmail.com

## EDUCATION

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### Bachelor of Science in Mechanical Engineering

Liberty University, Lynchburg, VA

Expected Graduation: May 2027

GPA - 3.79

## PROFESSIONAL EXPERIENCE

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### Thermal Hydraulics Engineering Intern, Framatome Nuclear

May 2025 - Present

- Developed a predictive wear mathematical model in Python for critical reactor components, proving to be over 75% more accurate compared to the previous model.
- Programmed a Python algorithm using a 6-dimensional Xarray to calculate safe reactor operating conditions, reducing computation time from >800 hours to minutes compared to prior methods.
- Performed system-level flow and vibration analyses using AFT Fathom and custom FIV modeling software.
- Awarded \$2,500 for my final summer presentation and hired on part-time during the school year.

### Chief Systems Engineer, Liberty Rocketry (9<sup>th</sup>/156 international teams in 2024)

June 2025 - Present

- Led a 60-member student team in the design, testing, and launch readiness of a high-powered rocket.
- Oversaw all engineering decisions across propulsion, avionics, recovery, and aerodynamic subsystems.
- Facilitated communication between internal teams, external vendors, and university faculty to optimize project efficiency.
- Displayed advanced proficiency in engineering software (e.g., SolidWorks, ANSYS, MATLAB) to verify the accuracy and feasibility of all subsystem models and simulations.

### Lead Undergraduate Research Assistant, Liberty University (CERE)

Sep 2024 - Present

- Led a team of 5 undergraduate students to perform split-Hopkinson pressure bar (SHPB) test, including sample preparation, high-speed imaging, electron microscopy.
- Assisted in the design and manufacturing of custom SHPB systems to fit material testing needs.

### Senior Structural Engineer, Liberty Rocketry

Sep 2023 - June 2025

- Utilized ANSYS Fluent & Mechanical, RocketPy, OpenRocket, and Onshape for simulations, FEA, and computational modeling, ensuring compliance with competition standards.
- Delivered reports to guarantee the rocket's compliance with competition standards and flight requirements.

### Camp Counselor Woodlands Camp, GA

May 2024 - Aug 2024

- Provided 24-hour care during weeklong outdoor camping trips with 12 children per week (ages 8 to 18), teaching survival skills, rock climbing, whitewater rafting, horseback riding, and cave camping.

## TECHNICAL SKILLS

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- Software: AFT Fathom, ANSYS fluent, ANSYS mechanical, SolidWorks, Onshape, OpenRocket, RocketPy
- Machines: Scanning Electron Microscope (SEM), Metal X 3D Printer, CNC, Waterjet, Lathe
- Programming Languages: MATLAB, Python

## PROJECTS

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### Unmanned Aerial Vehicle (UAV)

- Engineered a custom UAV with 3D-printed parts to support customizability and quick repairs.
- Conducted ANSYS CFD simulation to validate control surface performance.
- Developed and programmed a payload-deployment system to accurately hit a 5-foot wide target.

### Rocketry

- Built a two-stage rocket that reached over 2,500 feet and utilized my custom recovery system.

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## Changes for Ashlyn to look at

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### Assistant Chief Engineer (i put all this stuff in up top)

- Assisted in leading a 55-student team through engineering a high-powered competition rocket, managing design, testing, and competition readiness while preparing to transition to Chief Engineer in August.
- Collaborated with the Chief Engineer on team organization, recruitment, and conflict resolution by implementing structured delegation, mentoring sub-team leads, and ensuring effective communication.
- Contributed to subsystem design, propulsion, aerodynamics, and recovery optimization while supporting R&D on advanced composites, structural resilience, and system integration.
- Utilized ANSYS Fluent & Mechanical, RocketPy, OpenRocket, and Onshape for simulations, FEA, and computational modeling while assisting in technical justifications and design reviews to meet competition standards.

Add chief engineer

Add club start?

Chief Engineer

- Lead a team of 55 students to create a rocket to compete against 150+ international collegiate teams.
- Conflict resolution, organization, delegation, selection/interview, and leadership
- Innovate and engineer custom systems to set our rocket apart from the competition
- Use programs like ansys fluent and mechanical, rocketpy, openrocket, and onshape to create, test, and justify the rocket. Ultimately responsible for the rocket's success.
- Leading a team of 55 students in the full lifecycle development of a high-powered competition rocket, managing design, testing, and integration efforts to compete against 150+ international collegiate teams. Overseeing all technical and administrative aspects, ensuring efficiency and innovation while maintaining adherence to competition regulations and safety standards.
- Directing team organization, recruitment, and conflict resolution, mentoring sub-team leads, and fostering a collaborative work environment to optimize productivity and project success. Coordinating regular design reviews and ensuring streamlined communication across all subteams.
- Driving innovation by engineering custom subsystems, refining aerodynamics, and optimizing propulsion and recovery systems to set the team's rocket apart from competitors. Spearheading research and development efforts to push the boundaries of high-powered rocketry through advanced materials and system integrations.
- Utilizing ANSYS Fluent and Mechanical, RocketPy, OpenRocket, and Onshape to conduct in-depth simulations, finite element analysis, and computational modeling. Leading technical justifications for all design decisions, ensuring the rocket's structural integrity, aerodynamic efficiency, and overall mission success.

### Previous stuff just so we have it:

- Served as the Lead Structural Engineer on a team of 55, responsible for ensuring the rocket's structural integrity by running simulations and finite element analysis using ANSYS and SolidWorks, validating designs under real-world flight conditions.
- Designed and developed rocket body components capable of withstanding aerodynamic forces, pressure loads, and thermal stresses during ascent and descent.
- Collaborated with multidisciplinary teams to integrate aerodynamics, propulsion, and structural performance, optimizing the rocket's overall design for flight efficiency and resilience.

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- Employed complex mathematical models and engineering formulas to analyze material properties and load distributions, delivering comprehensive reports to guarantee the rocket's compliance with competition standards and flight requirements.