

Zachary I. Maldonado

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EDUCATION

Duke University

B.S. in Mechanical Engineering; Aerospace Engineering Certificate

GPA: 3.93/4.00

Aug 2023 - May 2027

Relevant Coursework/Expertise: Control Systems, Fluid Mechanics, Thermodynamics, Electromagnetism & Optics, Dynamics, Struc/Prop. of Solids, Mechatronics, Modern/Quantum Physics, Aircraft Performance, Space Systems Design

St. Mary's Ryken High School

Aug 2019 - May 2023

Awards: Valedictorian, Mathematics Departmental Award, Science Departmental Award, Project Lead the Way (PLTW) Engineering Distinguished

GPA: 4.00/4.00 (unweighted)

KEY COMPETENCIES

Soldering & Electronics

3D printing & Rapid Prototyping

3D CAD (SolidWorks, Fusion, OnShape)

Team Design Experience

MATLAB and Python

Machining / CNC

Composite Structures

LabVIEW

PROFESSIONAL EXPERIENCE

Mechanical Systems Engineering Intern (Secret Clearance), AEDC Hypervelocity Wind Tunnel 9 May - Aug, 2026

Tasked with designing control system architecture, hardware, and high-pressure + vacuum infrastructure to begin operation of a small Mach 5-7 adjustable-nozzle pulsed blowdown wind tunnel to be used for cost-effective validation of aero-optical techniques prior to their implementation in Tunnel 9. Created all-new LabVIEW code and UI for tunnel control and real-time pressure/temperature monitoring, control system for pulsed operation of solenoid and poppet valves, circuit board + custom housings and mounts, 3D CAD assembly for the entire tunnel, designed active nozzle configuration for future implementation, and planned future heater integration to avoid liquefaction.

Lighting & Electrical Intern, Energy Select Solar + Solutions

May - Aug, 2025

Worked with the interior lighting team to integrate various kinds of energy-efficient LED lighting systems for schools, universities, and private businesses or offices. Tasked with installation, testing and assembly of a large array of fixtures and with any accompanying changes and/or troubleshooting to existing building electrical.

Head Swim Team Coach, Breton Bay Sea Devils

June 2023 - Aug 2024

Responsible for planning and running swim practice for four age groups (80+ swimmers), five days per week with competitions twice per week. Used meet-manager software to seed swim meets, produce meet files and track progress. Daily responsibilities include competition setup, correspondence with other league teams + professionals and daily one-on-one technique instruction.

EXTRACURRICULAR PROJECTS & OTHER TECHNICAL EXPERIENCE

President, Duke Combat Robotics

Aug 2026 - Present

Previously VP; Leading DCR's first-ever hobbyweight (12lb) battlebot to compete at larger scale competitions. Club is organized into several subteams spread across antweight (1lb) and beetleweight (3lb) classes. Utilize impact-resistant materials for 3D printed parts and custom cut steel, aluminum, and high-strength thermoplastics for structural and weapon components. Package control electronics, weapon/drive motors, and wiring into lightweight designs.

Mechanical/Structures Subteam, Duke Electric Vehicles (DEV)

Sep 2025 - May 2026

2026 Shell Ecomarathon Competition: Responsible for the design and manufacturing of the aerodynamic carbon-fiber shell, as well as locking and door mechanisms for Duke's efficient fully electric urban concept car using SolidWorks, vacuum resin infusion techniques, and ANSYS Fluent software to validate design choices. Worked alongside chassis and vehicle dynamics subteams to integrate designs.

Electric Hydrofoil Kayak

Aug 2024 - Dec 2024

Used hydrofoil lift to modify a kayak to mechanically self-adjust and suspend itself and necessary equipment above the water. Integrated remote control capability and assembled, soldered and waterproofed electronic components into experimental design. Personally led rear-wing system design and fabrication. Received Fall 2026 innovation grant from Duke University Co-Lab to begin development of portable thruster + adapter capable of converting any surf/paddleboard electric.

Structures Subteam, Duke Aero

Jan 2024 - Sep 2025

Duke's high power rocketry team. Used SolidWorks to model fairings, bulkheads, structural segments and integrated them into team rocket. Also responsible for manufacturing; experience with CNC milling and water-jet stations around campus, as well as carbon fiber wet-layups for body structures.