

Zachary I. Maldonado

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EDUCATION

Duke University

B.S. in Mechanical Engineering; Aerospace Engineering Certificate

GPA: 3.94/4.00

Relevant Coursework: Multivariable Calculus, Linear Algebra, Mechanics of Solids, Engineering Innovation, Physics: Mechanics, Physics: Electromagnetism & Optics, Dynamics, Ordinary and Partial Differential Equations, Thermodynamics, Fundamentals of Mechatronics

Aug 2023 - May 2027

St. Mary's Ryken High School

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

GPA: 4.00/4.00 (unweighted)

Aug 2019 - May 2023

MECHANICAL & AEROSPACE ENGINEERING

Second-Year Engineering student at Duke University drawn to solving problems in the mechanical and aerospace fields. Offering a strong foundation in CAD and 3D printing, with experience in Python and MATLAB. Looking for an internship that will provide exposure to team design and bringing ideation to completion in the professional environment. For more information about technical experience and past projects portfolio visit <https://www.zachmaldonado.com>.

KEY COMPETENCIES

Soldering & Circuitry	Heavy experience with 3D printing	CAD (SOLIDWORKS, Onshape)	Team Design Experience
MATLAB and Python	Machining & CNC	Organization & Project Planning	Woodworking

PROJECTS & TECHNICAL EXPERIENCE

Deep Sea Whale Activity Monitoring Device

Sep 2023 - April 2024

Tasked by local client to devise a cost-effective method for recording whale sounds at 2000 meters below sea level. Finalized prototype runs with an Arduino and mems microphone encased in an epoxy filled PLA housing. Second prototype aims to utilize wireless charging and bluetooth sound data transmission to achieve a fully self-contained product.

The Flying Kayak

Aug 2024 - present

Using lift provided via hydrofoils to modify a kayak to suspend itself and necessary equipment above the water at a predetermined speed. Utilized RC electronics and assembled, soldered and waterproofed electronic components. Led construction of rear wing and CAD master assembly. Demonstration held early December 2024; trials largely successful and improvements currently underway for spring semester.

Duke Aero

Jan 2024 - present

Duke's high power rocketry team. Several sub-teams work together to deliver a high power solid-fuel rocket and fly it at the Spaceport America Cup in New Mexico each June. Used SOLIDWORKS and Onshape to model rocket components for consequent simulations and tests with FEA using ANSYS.

PROFESSIONAL EXPERIENCE

Breton Bay Golf & Country Club

Head Swim Team Coach

June 2023 - July 2024

Responsible for planning and running swim practice for four age groups, five days per week with competitions twice per week. Used meet-manager software to seed swim meets and produce necessary meet files, also responsible for creation of entry files containing events to compete in for each swimmer. Monitored each swimmer's clean strokes with Excel. Held position for two seasons.

Breton Bay Golf & Country Club

Lifeguard and Pool Operator

May 2021 - Aug 2024

Held position for four years. Apart from typical lifeguard duties and incident prevention procedures, played key role in maintaining chemical balance and functional pump room equipment. Gained experience with handling and mixing of acids and chlorine in pool facilities as well as with the mechanical components responsible for flow rates, filtration, and addition of chemicals.

Duke University

Lifeguard

Dec 2023 - Present

Taishoff Aquatics Pavilion & Brodie Recreation Center. Guard rec swim, special events and club practices.

EXTRACURRICULAR ACTIVITIES

Social Outreach Chair, Duke Combat Robotics

Dec 2023 - Present

Individually-built combat robot adhering to restrictions of ant-weight class. Gained experience with RC electronics, circuitry, CAD & 3D printing. Fought at Duke-hosted competition, placed 2nd. Responsible for competition setup, new member mentoring & recruiting,

Member, Astronomy Club

Aug 2023 - Present

Powerful telescopes used to observe stars, nebulae, planets, galaxies. In the process of constructing a telescope this/next semester

Structures Subteam, Duke Aero (see above)

Duke Catholic Center

Aug 2023 - Present