



MASON W. DUNSMUIR

AEROSPACE ENGINEERING



EDUCATION

Embry-Riddle Aeronautical University

Bachelor of Science, Aerospace Engineering
Minor: Computational Mathematics
Concentration: Rocket Propulsion

Daytona Beach, FL

2021 – 2025

GPA: 3.21/4.00

SKILLS & CERTIFICATIONS

CATIA V5 Specialist – Mechanical Designer (Dassault Systèmes) Credential ID: C-U6FH7JM9BP Mar 2025 – Present
CATIA V5 Specialist – Mechanical Surface Designer (Dassault Systèmes) Credential ID: C-ERMXX2F6SLU Mar 2025 – Present

Engineering Software: MATLAB 2025a, Simulink, Python, C++, CATIA V5, NX Siemens, NASTRAN, ANSYS

Sensor & Connector Systems: Pressure Transducers, Signal Conditioning, DAQ, CFRP/Nylon, PEEK

Modeling & Simulation: GNC Simulations, Monte Carlo Analysis, HIL, STK

Data Analysis & Illustration: Gantt Charts, Power BI, Tableau, Signal Processing, FMEA

Flight Software & Embedded Systems: C, C++, MATLAB/Simulink, Control Algorithm, Avionics Interface

Fabrication: CNC Machining, Manual Lathe, Laser Cutting, NDT&E, Composite Prototyping, Lost PLA Vacuum Casting

RELEVANT WORK EXPERIENCE

Federal Aviation Administration - Aviation Safety (AVS) Student Intern

Aug 2024 – Dec 2024

Assisted in robotic process automation (RPA) implementation for AIR-951 to maintain efficient certification processes. Supported in the implementation of a cloud-based database for tracking certification compliance and operational procedures. Shadowed activities in the Workforce Development Branch AIR-940 to expand skillset and understanding of federal workflows and procedures.

PROJECT EXPERIENCE

Shock Tube Optimization – “Design Build Test” Data Acquisition & Analysis | Shockwave Development

Jan 2025 – Apr 2025

Designed and integrated pressure transducers and data acquisition systems for shockwave measurement. Collaborated with machinists to resolve CAD-to-CNC compatibility issues, price quoting, and delivery estimates during shock tube test section fabrication. Adapted CATIA models and design tolerances with manufacturing constraints. Conducted signal processing analysis for data extraction.

Senior Capstone: RCS (Reaction Control System) Lead | GNC & Thruster Configuration

Jan 2025 – Apr 2025

Led thruster placement, CATIA V5 subsystem design, and control optimization for the Reaction Control System (RCS) on a multi-stage Mars mission. Conducted orbital mechanics simulations to ensure precise maneuverability and docking capabilities. Integrated feedback control algorithms and assessed sensor placement for optimal attitude determination.

Advanced Engine Assembly & CAD Optimization – CATIA V5 Specialist | Model-Based Systems

Jan 2025 – Apr 2025

Designed and modeled parametric components for a four-cylinder combustion engine, utilizing Generative Shape Design (GSD). Implemented assembly optimization techniques to improve ease of manufacturing and design flexibility. Conducted FEA analysis on components to verify structural performance under varying loads and kinematic scenarios.

TECHNICAL LAB EXPERIENCE

AE 443L – Dynamics and Controls | Embedded Systems

Jan 2025 – Apr 2025

Toolchain: MATLAB, Simulink

Focus: GNC system modeling and control law development

Tuned linear controllers for aerospace systems, verified response with root locus and Bode plots. Modeled state-space form and applied compensation techniques relevant to GNC.

AE 316L – Aerospace Materials and Manufacturing Applications

Aug 2024 – Dec 2024

Toolchain: MATLAB, Instron Testing System

Focus: Structural and thermal analysis of aerospace components

Evaluated aerospace-grade composites under fatigue, vibration, and thermal loading. Applied NDE/NDT methods including VT, PT, UT, and IR to assess material behavior under aerospace loading conditions.

AE 315L – Experimental Aerodynamics

Aug 2023 – Dec 2023

Toolchain: MATLAB, Transonic Wind Tunnel Instrumentation

Focus: Subsonic pressure distribution and aerodynamic loading

Collected wind tunnel data across airfoil geometries. Used MATLAB to generate Cp plots and identify boundary layer behavior.

INDEPENDENT ENGINEERING PROJECTS

Additive Manufacturing & Functional Prototyping

Dec 2024 – Present

Designed and fabricated tolerance-sensitive components using CATIA-driven STL workflows and FDM printing. Projects include annealed frames, epoxy-impregnated lattice structures, and casting-ready geometries. Focused on thermal deformation, moisture behavior, and adhesion in PLA Pro, with research-based analysis of PLA+, CF Nylon, and composite polymers. Integrated lost PLA and vacuum casting workflows and applied material science principles to evaluate Inconel 625 for nozzle backing applications.

LEADERSHIP & INVOLVEMENT

Phi Delta Theta Fraternity

Fall 2024 – Present

Actively participated in chapter events, philanthropy for ALS, and student leadership development. Supported campus service initiatives and promoted the Fraternity's core values of friendship, sound learning, and rectitude. Advised newer students of opportunities and challenges in their upcoming semesters.

STEM Outreach Club ERAU – Public Relations & Community Engagement

Fall 2022 – Present

Led public relations for STEM engagement events at Embry-Riddle and Volusia County schools. Supported outreach through presentations, hands-on demos, and student-coordinated STEM initiatives.

CFBAA & NBAA YoPro – Business Aviation Engagement

Fall 2022 – Present

Attended networking events, safety symposiums, and professional development sessions with A&P technicians, engineers, pilots, and Gulfstream operations teams. Participated in NBAA YoPro activities focused on connecting young professionals with industry leaders in business aviation.