Mason Canfield

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Education

James Madison University
B.S. Engineering (Electro-Mechanical Systems)
Minors: Mathematics, Robotics GPA: 3.44 | May 2027
Relevant Coursework: Calculus I–III, Linear Algebra & Differential Equations, Discrete Mathematics, Physics I–II, Statics & Intro Mechanics, Circuits & Devices, Engineering Design I–III, Thermodynamics*, Materials*

Skills

CAD & Design: SOLIDWORKS (CSWA), Fusion 360, parametric modeling, drawings, GD&T basics
Analysis & Testing: ANSYS (FEA), model validation, mesh refinement, experimental testing, data analysis
Programming & Controls: MATLAB, Simulink, Arduino, Embedded C++
Systems & Hardware: Sensors, actuators, power electronics, system integration, hardware debugging
Professional Tools: Excel, LaTeX, technical documentation, engineering reports

Projects

Shell Eco-Marathon – Frame Lead & Systems Modeling JMU

- Appointed Frame Lead based on prior structural analysis and finite element modeling experience
- Supporting senior design team with documentation, modeling, and validation preparation
- Developing MATLAB/Simulink road load model to support efficiency and drive-time optimization

Engine Mount Structural Analysis ANSYS Mechanical, Fusion 360

- Developed and validated multi-load case FEA model using bearing, fixed, axial, radial, and torsional constraints
- Performed mesh refinement and sensitivity studies to ensure numerical stability
- Documented assumptions, boundary conditions, and limitations for design assessment

Automated Watering System – Engineering Design II Arduino, Embedded C++

- Designed and tested autonomous dual-pump watering system with capacitive moisture sensing
- Implemented pulsed control strategy using 500 ms ON / 3 s OFF to prevent runoff and oversaturation
- Calibrated moisture threshold near 550/1023 ADC through iterative experimental testing
- Integrated manual override, status LED, and serial debugging for system validation

Model Rocket – System Design & Flight Performance Analysis Madison Aerospace Club

- Conducted trade studies comparing 4+ fin geometries, motors, and airframe configurations
- Evaluated apogee, stability margin, and sensitivity using OpenRocket simulations
- Supporting preparation for model selection, fabrication, recovery, and flight testing

Experience

Student-Athlete Tutor (Math & Science) JMU | Jan 2025–Present

- Applied structured problem-solving methods to explain calculus and physics concepts
- Created step-by-step solution frameworks to improve student performance and retention
- Maintained detailed records of student progress and instructional strategies

Landscaping Technician Steeplechase Lawn Services | May 2023–Aug 2025

- Maintained, repaired, and troubleshot mechanical equipment and small engines
- Performed preventive maintenance to reduce equipment downtime
- Followed safety procedures and work schedules in physically demanding environments