

# Matthew V. Lewton

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## Education

**Purdue University | West Lafayette, IN**

Bachelor of Science in Mechanical Engineering

**Expected Graduation: December 2025**

**GPA: 3.96/4.00**

## Experience

**Composites Manufacturing & Simulation Center - West Lafayette IN**

May 2023–August 2023

*Undergraduate Research Assistant*

- Designed and manufactured nozzle to convectively heat continuous carbon fiber additive manufacturing.
- Modeled convective heat transfer conditions in Matlab to determine nozzle geometry for high filament feed rates.
- Optimized pultrusion system's polymer chamber for optimal roller contact pressure, and even heat distribution.
- Analyzed temperature distribution of pultrusion chamber using Abaqus thermal to simulate heater PID control.
- Machined stainless steel pultrusion chamber and convective nozzle assemblies to tight tolerance fits.

**Bechtel Innovation and Design Center- West Lafayette, IN**

April 2022–Present

*Manufacturing Peer Mentor*

- Conduct CAD/CAM consultations with students seeking to design and manufacture parts for projects in research, automotive racing, rocketry etc.
- Advise students on part manufacturability, tooling and work holding for their machining operations.
- Teach students to set up and operate Haas 3 & 5 axis CNC mills, live tooling lathe, and waterjet.

## Projects

**Purdue Space Program Liquid Rockets Team**

August 2021–November 2023

*Vehicle Structures Lead*

- Led team of 35 students in conceptualization, design, and manufacture of primary structures for an 850 lbf Ethanol-LOX rocket launching to 40,000 ft.
- Advised structures, fluids, and propulsion teams on part manufacturability, assisted new members with CAM, tolerancing, and mechanical fit specs, and machined primary airframe components.
- Developed a program to calculate vehicle's bending load profile due to aerodynamic and inertial loads
- Orchestrated system and component design of lower airframe's strut structure, driven by thrust and inertial loads, fin attachment/alignment, and plumbing access on the pad.
- Optimized airframe struts for mass considering failure in bending induced stress, lateral buckling, and torsional buckling using hand calculations and FEA.
- Led exploration of composite manufacturing techniques and destructive testing campaign for a structural carbon fiber airframe, managing 15+ team members during layups and laminate post processing.
- Determined carbon fiber airframe's expected failure mode and optimized laminate using Ansys.

**Portfolio Website: mattlewtton.me**

- Created custom HTML templates for Jeckyll to generate articles, images, links etc.
- Article content written in Markdown with custom image box templates to simplify site maintenance.
- Styled with homemade CSS library.

## Technical Skills

**Software:** Siemens NX, Ansys, Abaqus, Solidworks, Fusion 360 (CAM), Excel, HAAS CNC (CAM and IPS/VPS)

**Programming Languages:** Python, MATLAB, C, HTML/CSS