

CAROLINE ZIMMER

czimmer@seas.upenn.edu | (214) 843-9070 | Portfolio: carolinezimmer.com | <https://www.linkedin.com/in/carolinezimmer1/>

EDUCATION

University of Pennsylvania, School of Engineering and Applied Science | Philadelphia, PA May 2027

Candidate for Bachelor of Science in Engineering | **GPA:** 3.66 / 4.0

Major: Mechanical Engineering (Robotics Concentration) | **Minors:** Mathematics, Engineering Entrepreneurship

Relevant Coursework: Machine Design & Manufacturing, Mechatronics, Dynamics, Statics & Structures, Engineering Entrepreneurship, Thermodynamics, Fluids Engineering

The Hockaday School | Dallas, TX

May 2023

Unweighted GPA: 4.14/4.3 | SAT Score: 1520; Math (780); Reading Writing (740)

Honors & Awards: Graduated Cum Laude, Richard Dubsky Excellence in Mathematics Award, National Hispanic Recognition

EXPERIENCE

Enfra Solutions | *Mechanical Engineer Intern* Summer 2025

- Delivered finalized AutoCAD models of complete HVAC ductwork and piping systems for construction plans within the Novant Health hospital network, contributing to the largest Energy-as-a-Service transaction in US healthcare history and advancing energy-saving infrastructure for clinical environments
- Created comprehensive 3D models of existing ductwork and piping layouts in Revit, coordinating with mechanical teams and field surveys to ensure spatial accuracy and support future renovation planning
- Drafted detailed reports quantifying energy and monetary savings by integrating metered energy consumption data with utility bills, verifying that facility performance met guaranteed energy efficiency targets

Engineers Without Borders at Penn | *Project Team Member*

September 2023 – May 2025

- Produced AutoCAD models of construction plans for an ADA-compliant ramp for a local community center
- Collaborated with multidisciplinary engineering teams and professional advisors to align projects with community, safety, and ADA standards, while expanding access for individuals with limited mobility

PROJECTS

Mechanical Design and Precision Manufacturing Project | Gamma-type Stirling Engine Fall 2025

- Design and model a functional Gamma-type Stirling engine assembly in Solidworks with built-in tool libraries
- Program CNC toolpaths in Mastercam and conduct high-precision machining operations (lathe, mill, threading, reaming), translating CAD models into manufacturable components that are in spec with the engineering drawings
- Applied GD&T principles and tolerance stack-up analysis across critical interfaces to optimize component dimensions, improving engine efficiency, reliability, and ease of assembly

Mechanical Design Project and Flight Model | Bottle Rocket and Propulsion Flight Model

Spring 2025

- Designed, built, and tested butane-propelled water bottle rocket modifications using SolidWorks and DraftSight
- Developed and calibrated a rocket propulsion simulation in Python, integrating empirical data to fine-tune trajectory predictions under varying launch conditions using aerodynamic modeling and iterative experimentation

Mechanical Design & Fluid Systems Project | Water Tower and Pump

Fall 2025

- Design and analyze 6 ft wooden water tower assembly in SolidWorks, performing FEA analysis to assess structural strength, incorporate safety factors, and optimize truss configurations
- Conduct rapid prototyping of custom dowel joints and pump nozzles, integrating experimental water flow rates and theoretical modeling to optimize pump performance, nozzle flow, and system efficiency

INTERESTS AND EXTRACURRICULARS

Clubs & Leadership: Kappa Alpha Theta Sorority Beta Eta Chapter (Academic Development Director); Society of Hispanic Professional Engineers (Member); Guidance, Empowerment, and Medicine for Women's Health (Member)

Interests: Sustainable engineering, Engineering Entrepreneurship, Sewing and Embroidery, Weightlifting, Sudoku

TECHNICAL SKILLS

Programming Languages: Java, Python, MATLAB

Software/Tools: SolidWorks, AutoCAD, Revit, COMSOL, Arduino, CNC Mastercam