

Zachary Busch

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EDUCATION

Drexel University

Bachelor of Science in Electrical Engineering
Bachelor of Science in Computer Engineering (Dual Degree)
Co-op Availability: April - August 2027 (Spring/Summer)

Philadelphia, PA

(Expected Graduation: June 2030)

GPA: 3.45

RELEVANT COURSEWORK (* in progress)

- Digital Logic Design / Engineering Design / Programming for Engineers I, II / Physics I, II, III
- Calculus I, II, IV / Foundations of Electric Circuits* / C Programming* / Linear Algebra*

SKILLS

- **CAD & Design:** SolidWorks / Onshape / KiCad / 3D Printing / Blender
- **Electronics:** Soldering / Breadboarding / PCB Layout / Multisim
- **Lab Equipment:** Oscilloscope / Multimeter / Bench Power Supply
- **Programming & Tools:** Python / C / Git / Linux / VS Code
- **Certifications:** SolidWorks Certified Associate (CSWA) / Additive Manufacturing (CSWA-AM)

PROJECTS

Liquid-Cooled Small-Form-Factor Workstation

Independent Project

(January 2026 - Present)

- **Chassis:** Designed a ~9 L folding case in Onshape, leveraging carbon fiber's stiffness and titanium's strength, allowing ~122 watts per liter est. cooling, ~3× commercial cases
- **Thermal Design:** Sized 360 mm radiators for a ~1.1 kW heat-load budget via $W/^{\circ}\text{C} \times \Delta T$ analysis
- **Compute Board:** Developed KiCad carrier board schematic from LattePanda Mu datasheet, including power input stage and PCIe 4.0, USB 3.2, HDMI, and 1 GbE integration, verified with ERC
- **Waterblock:** Modeling in SolidWorks an ultra-thin 6.5 mm copper motherboard block with a 0.10 mm CPU jet gap, optimized so the pumps deliver 3.5-4 L/min through its restriction

Everyday EDC - Minimalist Wallet Concepts

Independent Project

(April 2026 - August 2026)

- Created two aluminum wallet products end to end: Onshape CAD, Blender renders, and Astro sites
- Rapidly iterated 3D-printed prototypes to refine tolerances, fit, and card hold before CNC drawings
- **MagWallet:** 7 mm MagSafe wallet replacing wear-prone elastic straps with friction-fit card inserts
- **Slide Wallet:** Engineered 12-magnet retention for a slide-out 3-card wallet with RFID read-through

Optical Fiber Communications for AI Computing Systems

Drexel University

Team Lead, First-Year Engineering Design

(March 2026 - June 2026)

- Led a 3-person team on an optical network design for a 64-rack AI data center; ranked 2nd of 10 teams
- Architected a 4-layer topology: GB300 trays, NVL72 racks, optical circuit switching, DWDM transport
- Evaluated and specified switching and DWDM hardware for rack-to-rack and pod-to-pod links
- Delivered a team-verified 800 Gbps per link, 34 dB SNR, and 10^{-12} bit error rate

ACTIVITIES & AWARDS

- **Drexel Formula SAE** - Member (2026 - Present)
- **SkillsUSA** - 2nd Place, Electronics Technology, State Competition (2024)