

Christopher Collier
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Education

University of Delaware

August 2023 – May 2027

B.S. in Biomedical Engineering, Minor in Biomechanical Engineering (GPA: 3.83/4.00)

Incoming M.S. in Robotics, Fall 2027

- Dean's List (6/6) | Recipient of Presidential Scholarship | McCauley Miriam Engineering Scholarship

Experience

Senior Design, University of Delaware – Teaching Assistant

August 2026 - Present

- TBD

Nemours Children's Health – Engineering Research Intern (BRITE Lab)

May 2026 – August 2026

- Redesigned microfluidic oxygenator sealing; validated 80 cN·m for 125–175 μm channel heights
- Identified leaks and defects using dye perfusion, identifying failure modes for design refinement
- Developed automated UV adhesive dispensing for hollow fiber membrane bonding

Medical Device Design, University of Delaware – Teaching Assistant

January 2026 – May 2026

- Guided 15 student teams through the medical device design process
- Supported lab/studio activities, SolidWorks (CAD) instruction and provided feedback on technical documentation

Residence Life & Housing, University of Delaware – Resident Assistant

August 2024 - Present

- Support and guide 40 students; resolve resident issues, respond to emergencies,
- Coordinate events and mentor students on academic and personal concerns

Projects

Radial Arterial Catheterization Wrist Brace – Biomedical Engineering Junior Design

February 2026 – May 2026

- Designed a clinician sponsored wrist brace maintaining a 0-20° extension while preserving catheter access
- Created 3D-printed prototype using SolidWorks, authored engineering drawing packet of model
- Executed verification and validation testing including structural compliance, extension angle, and ease of use
- Performed cost analysis of all purchased items and recommended injection-molded path for cost viability

Three-Compartment Pharmacokinetic Model of Propofol – Biomedical Modeling and Simulation

February 2026 – May 2026

- Implemented a three-compartment PK model in MATLAB (ode15s) to simulate plasma and tissue concentrations
- Performed observability and controllability analysis on the state-space system, confirming full rank
- Designed a sampling schedule from drug half-lives and modeled lognormal noise to simulate measurement error

Biomechanical Analysis of Squat Variations – Clinical Biomechanics

February 2026 – May 2026

- Collected 3D kinematic data from 19 participants across 3 squat variations using OpenCap motion capture
- Analyzed joint angles, squat depth, and velocities on JMP using ANOVA with Tukey HSD post-hoc testing
- Identified significant differences in knee angle and movement velocity by squat type, informing rehab loading

Campus Involvement

Delaware Men's Club Volleyball – Captain & Vice President

September 2023 - Present

- Mentored new team members as Rookie Educator, supporting player development
- Rookie of the Year (2024), A Team MVP (2025, 2026), Defensive Player of the Year (2025, 2026)

Skills

- CAD/Design: SolidWorks, Onshape, Autodesk Fusion
- Fabrication: 3D printing (Bambu Lab, Formlabs), laser cutting, automated dispensing, soldering
- Analysis/Programming: MATLAB, Python, JMP, LTSpice, Waveforms, Arduino
- Software: Microsoft 365, Google Workspace