LANCE P. NICHOLLS

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EDUCATION

Johns Hopkins University Baltimore, MD
Master of Science in Mechanical Engineering (4.0 GPA) Expected May 2027

- Concentration: Biomechanical Engineering.

Johns Hopkins University Baltimore, MD
Bachelor of Science in Mechanical Engineering (3.59 GPA) Expected May 2026

- Minors: Applied Math and Statistics (AMS) and Psychology.
- Honors: Dean's List Spring 2023, Fall 2023, Spring 2024, Spring 2025.
- Relevant Coursework: Locomotion Mechanics, Materials Selection, Additive Manufacturing, Bio-solid Mechanics, Statics & Mechanics of Materials, Thermodynamics, Dynamics, Mechanics-Based Design, Electronics & Instrumentation, Fluid Mechanics, Heat Transfer, Digital Analysis of Dynamical Systems.
- Activities: Varsity Cross Country, Indoor and Outdoor Track and Field Athlete, Athletics Captains Cohort.

TECHNICAL SKILLS

Technology: MATLAB | CAD - SolidWorks, PTC Creo, Fusion 360 | Microsoft Office - Word, Excel, etc
Manufacturing: 3D Print | Laser Cut | Drill Press | Bandsaw | Lathe | Mill | Mig Weld | Design for Manufacturing
Social: Leadership | Teamwork | Sports Science | Public Speaking | Lab Research | Spanish - Bilingual Proficiency

PROJECTS

Diabetic Foot Tissue Mechanics Model, Johns Hopkins Bio-solid Mechanics Course January 2025 - May 2025

- Led team modeling diabetic and healthy plantar tissue applying hyper-elastic fits to experimental data; found diabetic tissue had 40% higher peak stress and showed orthotic insoles decreased stress in vulnerable areas.

Additive Manufacturing Plant Pot, Johns Hopkins Additive Manufacturing Course August 2024 - December 2024

- Collaborated on designing and prototyping a 3D-printed plant pot utilizing additive manufacturing, reducing water loss and extending plant life by increasing soil moisture duration by over 500% through iterative testing.

Precision Machined Stirling Engine, Johns Hopkins Manufacturing Course August 2024 - December 2024

- Machined functional Stirling engine with 20+ precision components using milling, turning, sand casting, and sheet metal tooling, strengthening hands-on manufacturing and machining expertise.

PROFESSIONAL EXPERIENCE

Undergraduate Research Assistant Baltimore, MD
Johns Hopkins, Musculoskeletal Tissue Engineering Lab February 2025 - Present

- Created mechanical testing apparatus to assess patellofemoral contact pressures in 10 unique cadaveric knee models.
- Conducted biomechanical experiments using pressure sensor technology to evaluate impact of surgical site closure on joint loading and cartilage health, demonstrating over 10 percent higher joint pressures with site closure.
- Partnered with a 4-member surgical research team to optimize protocols and ensure clinical relevance.

Project Engineer Intern Audubon, PA
Globus Medical, Excelsius Deformity Solutions June 2025 - August 2025

- Modeled and optimized spinal implants and tools in Creo Parametric for treating complex deformities.
- Designed a spring-loaded spine model system adaptable to pediatric and adult deformities, enabling 200+ customizable point loads ranging from 0.5-25 lb for surgeon demonstrations and product validation.
- Redesigned pedicle screw removal tool to fit 10+ screw types; added welded handles to improve usability.
- Developed screw loading module for pre-op verification, accommodating 20 pedicle screws and reducing surgical error.
- Partnered with cross-functional teams in 3 departments (engineering, manufacturing, regulatory) to enhance designs.

Mechanical Engineering Intern Pittsburgh, PA
University of Pittsburgh McGowan Institute, RiMed Lab May 2024 - August 2024

- Led mechanical uniaxial/biaxial tension, bending, and pressure-volume tests on 60+ tissue-engineered valve samples.
- Developed MATLAB scripts to analyze 2,700 histology images, decreasing processing time by 75% and streamlining data analysis.
- Formulated and fabricated a four-jaw chuck in SolidWorks for validating a biaxial tension testing device.
- Performed statistical analysis of mechanical test data using Excel and MATLAB.
- Dissected sheep hearts to extract pulmonary valve leaflets, preparing samples for 5 unique mechanical tests.