BRADEN NICHOLSON

Rockford, IL | raynich1@gmail.com | (847) 989-7840 | bradennicholson.info | linkedin.com/in/braden-nicholson/

Education

University of Cape Town (UCT), Cape Town, South Africa 01/2022 - 11/2026

- MScEng in Mechanical Engineering (in progress, expected submission January 2027)
  - Dissertation-based degree developing a novel extreme-temperature fracture toughness testing module
- BScEng in Mechanical Engineering (completed December 2024)
  - GPA: 78.54/100 (first class distinction, $\approx$ 3.8 GPA)
  - SAIMechE award for best final year thesis project (grade of 95)

Northern Illinois University (NIU), DeKalb, IL, USA 08/2019 - 12/2021

- B.S. Mechanical Engineering (transferred to UCT)
  - GPA: 3.701/4.0, participant in Honors program

Professional experience

Lab engineer (part-time), Centre for Materials Engineering, Cape Town, South Africa 09/2022 - 10/2026

- Supported materials research through engineering work, designing/modifying equipment
- Guided postgrad students in testing activities
- Supervised undergraduate interns, designing and overseeing their projects
- Assisted with general laboratory upkeep

Lecturer, Centre for Materials Engineering, Cape Town, South Africa 02/2025 - 03/2026

- Taught a part of the Honors class "Microstructure & phase transformations in engineering metals" each year

Teaching assistant, Department of Mechanical Engineering, University of Cape Town, Cape Town, South Africa 01/2025 - 12/2025

- Assisted the mechanical engineering department's senior design class throughout 2025
- Included design guidance/teaching good practice and running workshop assembly sessions

Mechanical engineering intern, GasCon, Cape Town, South Africa 06/2024 - 07/2024

- Interned at a large-scale pressure vessel manufacturing company
- Gained experience in engineering design of pressure vessels, in the mechanical laboratory (materials testing and validation), and the machine shop
- Streamlined the software processes in the laboratory's filing system by introducing automation of material test data creation and storage

Job shadow experience, Smalley Springs and Rings, Lake Zurich, IL 01/2020

- Shadowed design engineers in Smalley, a company that designs and manufactures springs/retaining rings for a wide variety of clients

Projects

Extreme-temperature fracture toughness testing module 01/2025 - 11/2026

- For MSc, designed a module for a Gleeble 3800 thermo-mechanical simulator capable of testing metal fracture toughness at temperatures up to 1000 °C, using induction heating
- Can perform tests in minutes whereas furnace heating takes hours, increasing time efficiency by an order of magnitude

Desktop injection molding machine automation 01/2024 - 07/2025

- In spare time from studies, worked on automating a manual injection molding machine
- Involved temperature control, powertrain design, AC induction motor control, and mechanical design for strength

Tensile grip design 01/2024, 08/2026

- Designed separate pairs of low-force tensile grips two years apart
- Used for novel polymer research and aluminum sheet testing

Handheld torque wrench 02/2024 - 10/2024

- Group senior design project, chosen as team lead due to outstanding performance
- Designed and manufactured a battery-powered torque wrench meant for pipe fittings

Vacuum reaction stirring device 10/2023

- Created magnetically-coupled device for stirring viscous chemical reactions under vacuum
- Similar to commercial options at a fraction of the cost
- Involved designing and machining PTFE parts, providing unique challenges

Skills

Engineering software: SolidWorks, ANSYS Mechanical, ANSYS Electronics, Python, MATLAB, NumPy, KiCad, LTSpice, LaTeX, PlatformIO, Git, EzCad, Microsoft Office, MatchID

Knowledge areas: Mechanical design, design for manufacturing, geometric dimensioning and tolerancing (GD&T), structural and electromagnetic simulation (basic), computer-aided design (CAD), material characterization, automation, mechatronics (basic), data analysis, research & development, metrology, high-temperature design, advanced materials, mechanical testing, fracture mechanics

Auxiliary (soft) skills: Project management, organization, teamwork/collaboration, technical writing, presentation, professional communication, working in teams