JUSTICE BROWATZKE

Mechanical Engineering Student · Otipemisiwak Métis Government Citizen (Métis Nation of Alberta)

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Mechanical engineering student entering fourth year at the University of Calgary, graduating April 2027. Brings six years of full-time experience before university across high-pressure well testing and slickline, residential framing business ownership, and aircraft ground operations. Continued working in aviation throughout the degree while developing design and analysis capability through 3D CAD, thermal-fluid systems, and data-driven model evaluation. Available immediately for 4- to 16-month work terms and open to relocation.

EDUCATION

BSc Mechanical Engineering, Minor in Biomedical Engineering | University of Calgary — Sept 2023 - Apr 2027 (expected)

- Schulich School of Engineering. Entering fourth year, including capstone design.
- Relevant coursework: machine component design, heat transfer, mechatronics, manufacturing processes.

TECHNICAL SKILLS

Design 3D CAD (parts, assemblies, drawings, BOMs), AutoCAD, drawing interpretation (structural, P&ID)
Analysis & Data MATLAB, ANSYS, Python (scikit-learn, PyTorch), Excel engineering calculations, numerical methods
Field & Operations Equipment inspections, field records, safety-critical radio communication, crew coordination

EXPERIENCE

Aircraft Tow Operator | Jazz Aviation, Calgary, AB — Mar 2022 - Present

- Tow and reposition Q400 and CRJ900 aircraft between gates, hangars, and maintenance bays, coordinating by radio with ground control, ramp, and flight crews.
- Perform pre-move walk-arounds and inspect towing interfaces before every move; set and remove chocks and confirm brake checks.
- Logged aircraft moves and equipment issues for safety and compliance across changing weather and active ramp conditions.

Airport Equipment Operator | APX, Calgary, AB — Nov 2023 - Feb 2024

- Operated skid steer, loader, and sweeper equipment for airport apron clearing during winter storms while carrying a full engineering course load.

Owner / Operator | JBK Framing, Kelowna, BC — Mar 2020 - Mar 2022

- Ran a registered, insured framing business under WorkSafeBC requirements, building homes from foundation formwork through wood framing, including ICF builds and concrete pours.
- Planned materials, sequencing, and site work to inspection-ready standard across walls, floors, roofs, and stairs.

Well Testing Operator | TARA Energy Services, Grande Prairie, AB — Dec 2017 - Feb 2020

- Rigged up and tore down high-pressure flow lines, separators, and manifolds for flowback and well test operations.
- Monitored pressure, flow rate, temperature, and fluid-level readings; recorded field data and shift notes for supervisors and office engineers.
- Assisted with routing flow through pressure-rated equipment as conditions changed, and with H2S safety checks and gas sampling under site procedures.

EXPERIENCE (CONTINUED)

Wireline Operator | Carnwood Wireline Service, Grande Prairie, AB Sep 2017 - Jan 2019

- Operated a slickline truck on conventional production wells; performed de-waxing and paraffin cleanouts and supported wireline and swabbing crews.
- Completed job tickets, customer sign-offs, and surface data logging; assisted with stuck-tool retrieval jobs.

SELECTED ENGINEERING PROJECTS

PC Liquid Cooling System | ENME 471 Heat Transfer (system design, analysis, reporting) Fall 2025

- Designed a custom CPU and GPU liquid cooling loop for a 600 W heat load with an 80 °C component temperature limit.
- Sized a 20-fin micro-channel CPU cold plate, a pin-fin GPU cold plate with asymmetric branches for VRAM and VRM loads, and a copper radiator with 192 annular fins and two 140 mm fans.
- Predicted 64.1 °C GPU and 67.0 °C CPU temperatures at a 26.3 kPa system pressure drop, leaving a 31 percent hydraulic margin below the pump head limit. Metrics verified against the final design report.

Schulich Helios Solar Car | Mechanical team member, University of Calgary 2025 - Present

- Contribute to the team's sixth-generation multi-occupant solar car build; disassembled the previous vehicle, inspected parts for reuse, worked with molds, and supported roll-cage manufacturing.
- Helped source materials and make budget-aware purchasing decisions on an ambitious one-year build that reached a rolling chassis.

Sepsis Classifier Study | BMEN 415 (model design, verification, reporting) Winter 2026

- Compared logistic regression, tree ensembles, and a four-layer neural network on incomplete, imbalanced clinical time-series records, using a patient-level held-out split to reduce leakage risk.
- Improved balanced accuracy from 0.632 to 0.685 and ROC-AUC from 0.678 to 0.745 with a regularized logistic model, and rejected alternatives whose precision gains cost too much recall. Results verified against the final report.

AWARDS

- Syncrude Indigenous Engineering Scholarship, Indspire, $8,000 (2026)
- BHP Bursary, $5,000 (2024)
- Indigenous Career Award, $4,000 (2024)
- Diversity Champions in Engineering Award, $4,000 (2023)

CREDENTIALS

- Class 5 driver's licence (Alberta)
- Airport credentials: RAIC, AVOP, and D/A clearance (YYC airside)