MICAH HAILE

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PROFESSIONAL PROFILE

First-generation immigrant with demonstrated adaptability, discipline, and reliability, having balanced full-time technical studies with paid work and leadership roles. Known for strong work ethic, accountability, and readiness to contribute in fast-paced, real-world engineering environments

Available for 16-month internship starting May 2026

EDUCATION

Mechanical Engineering Technology Diploma, Major in Design and Analysis | Expected April 2026
Southern Alberta Institute of Technology (SAIT) | Calgary, AB

- Bissett Scholars Full-Ride Scholarship Recipient
- IPEIA Scholarship Recipient
- Key Concepts:
- **Thermodynamics**
    - Energy balance and conservation applied to real thermal systems
    - Steady-state and transient thermal behavior analysis
    - Heat transfer fundamentals (conduction, convection, radiation)
    - Thermal resistance networks and heat-flow modeling
    - Thermodynamic cycle analysis used in power generation, propulsion, and refrigeration systems:
    - Brayton cycle (Gas turbines, jet engines)
    - Advanced Rankine cycle (steam power plants, waste-heat recovery)
    - Ramjet cycle (high-speed air-breathing propulsion concepts)
    - Vapor-compression cycle (HVAC and refrigeration systems)
    - Performance evaluation using efficiency, work output, heat input, and coefficient of performance (COP)
- **MACH**
    - Dynamic behavior of mechanical systems under free and forced vibration
    - Natural frequency, damping ratio, and resonance and their impact on stability and comfort
    - Harmonic excitation analysis and time-domain dynamic response
    - Spring–mass–damper modeling for vibration control and system prediction
- **Fluids**
    - Pump and turbine fundamentals (centrifugal vs positive displacement) applied to fluid-energy system
    - Pressure, head, and energy balance for piping and flow networks
    - Cavitation and NPSH analysis for pump operating limits and reliability
    - Internal flow regime analysis (laminar vs turbulent) and performance implications
    - Pressure loss mechanisms and friction modeling in pipes and fittings
    - Dimensional analysis and similarity (Re, Nu, Pr) for scaling and heat-flow correlation
    - Structure–property–processing relationships for informed material selection
    - Mechanical failure mechanisms (fatigue, fracture, creep) and design implications
    - Corrosion mechanisms and mitigation strategies for durability and safety
    - Heat treatment effects on mechanical and thermal material behavior
- **Advanced Manufacturing**
    - Machining processes (turning, milling, drilling) and tolerance capability awareness
    - Metal forming processes (rolling, extrusion, sheet-metal forming) and geometry constraints
    - Casting processes and common defect awareness
    - Joining methods (welding, mechanical fastening, adhesive bonding) and application trade-offs
    - Design for Manufacturing and Assembly (DFMA) principles to reduce cost and complexity
    - Tolerances, fits, and manufacturability constraints for production-ready designs

ENGINEERING STUDIES & TECHNICAL REPORTING

Product Design and Sustainability Analysis - Gourmet ECO Juice Extractor [Team Lead | Team Project]

Technical Report | Southern Alberta Institute of Technology (SAIT), Calgary, AB | Nov 2025 | Grade B

- Led a 4-student team in completing a technical report writing project aligned with real-world product development practices for a consumer kitchen appliance
- Performed an engineering evaluation of ease of use, functional performance, and environmental impact, with emphasis on user interaction, materials selection, and lifecycle considerations
- Conducted primary research through product handling, functional decomposition, and usability assessment, and secondary research using comparable products, materials data, and sustainability benchmarks
- Structured findings to reflect product development decision-making, including identification of design trade-offs, constraints, and improvement opportunities
- Authored and coordinated a formal technical engineering report, ensuring clarity, traceability of assumptions, and evidence-based conclusions suitable for review by a product development team
- Presented technical findings and recommendations to peers and instructors, communicating engineering rationale clearly and responding to technical questions

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Manufacturing & Quality Systems Study – Railway Tracks [Team Lead | Team Project]

Technical Report | Southern Alberta Institute of Technology (SAIT), Calgary, AB | January 2024 – Feb 2025 | Grade A+

- Led a four-member team in authoring a 23-page technical report analyzing railroad track systems from material selection through manufacturing, installation, and long-term maintenance
- Analyzed steel production routes, including blast furnaces, BOF steelmaking, continuous casting, rolling mills, heat treatment, and finishing processes
- Documented quality control and inspection frameworks, including ultrasonic testing, dimensional verification, and post-installation monitoring aligned with Transport Canada and industry standards
- Evaluated failure mechanisms, wear, fatigue, corrosion, and maintenance requirements, emphasizing lifecycle reliability and safety-critical performance
- Compared manufacturers based on cost, quality, durability, and environmental management systems (ISO 9001 / ISO 14001)
- Developed process flow diagrams and system-level overviews to communicate complex production and inspection workflows clearly
- Presented engineering analysis and conclusions to a technical audience, defending assumptions, standards, and design decisions under review

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ENGINEERING PROJECTS & OPERATIONAL ANALYSIS

SUV Suspension Design and Ride Dynamics Evaluation – Toyota 4Runner Suspension System [Individual Project]

Course & Independent Study | Southern Alberta Institute of Technology (SAIT), Calgary, AB | December 2025 | Grade A+

- Designed and analyzed a quarter-car suspension model for a 5th-generation Toyota 4Runner by representing one vehicle corner as a mass–spring–damper system, to evaluate ride comfort and dynamic stability under realistic low-speed urban conditions
- Selected suspension stiffness and damping parameters using experimentally identified data from comparable mid-size SUVs, to compensate for unavailable manufacturer specifications while maintaining physical realism
- Assumed and justified a constant damping ratio of $\zeta = 0.35$ to balance ride comfort and handling, resulting in a suspension response consistent with accepted passenger-vehicle ranges ($\zeta \approx 0.2–0.4$)
- Modeled road-induced base excitation by simulating periodic surface irregularities (0.005 m amplitude) and a standardized speed bump (0.10 m height, 0.35 m length), to assess suspension response across smooth and disturbed driving scenarios
- Developed and executed numerical simulations in GNU Octave to compute natural frequency, damping coefficient, forcing frequency, transmissibility, and time-domain response, enabling quantitative evaluation of ride dynamics
- Demonstrated that the designed suspension transmitted ~14% displacement under uneven road excitation (0.005 m road input → ~0.0057 m chassis response), indicating acceptable ride comfort

- Verified dynamic stability by showing that chassis oscillations decayed to negligible levels within ~2 seconds following speed-bump and pit disturbances, confirming adequate damping and system stability

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Motor Housing Reverse Engineering – Drill Motor Case [Individual Project]
Reverse Engineering Project | Southern Alberta Institute of Technology (SAIT), Calgary, AB | December 2025 | Grade: A+

- Reverse-engineered a handheld drill motor casing by extracting functional dimensions from physical components to recreate a manufacturable design with controlled fits and geometric constraints
- Applied ISO H7/u6 hole–shaft fits and circularity tolerances to critical bores and mating features to ensure proper press-fit performance, alignment, and repeatable assembly
- Developed fully parametric SolidWorks models of the inner housing, outer shell, and press-fit interfaces to preserve design intent and enable rapid tolerance adjustment
- Generated complete GD&T drawing packages (datums, size and geometric tolerances, section views) in accordance with ASME Y14.5, supporting inspection and manufacturing handoff
- Evaluated material and manufacturing process options, identifying galvanized steel and deep drawing with secondary stamping as the most likely production route based on geometry and load transfer
- Documented press-fit constraints, assembly sequence, and functional requirements to reduce assembly risk and dimensional stack-up issues

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Swiss Knife Design & Analysis [Design Engineer | Team Project]
Design and Technical Report | Southern Alberta Institute of Technology (SAIT), Calgary, AB | Fall 2025 | Grade: A+

- Led the mechanical design of blade and casing assemblies by defining functional interfaces, load paths, and clearances, to ensure safe operation and compatibility with downstream analysis and manufacturing
- Completed all design deliverables on schedule, by planning and executing parametric CAD work early, allowing analysis and peer review to proceed without project delays
- Applied ASME Y14.5 GD&T by selecting datums and controlling size, position, and profile tolerances, to ensure repeatable fit, alignment, and inspection feasibility
- Designed components using DFMA principles by simplifying geometry, reducing part complexity, and specifying realistic tolerances, to minimize manufacturing risk and assembly effort
- Generated complete part, assembly, and drawing packages with tolerances, fits, and manufacturing notes, resulting in a production-ready engineering package suitable for manufacturability review
- Supported structural validation by collaborating with the analysis engineer on stress, deflection, and material checks, confirming that the design met load and performance requirements

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Low-Temperature Differential Stirling Engine – Design, Manufacturing & Testing [Individual and Team Project]

Course Project | Mechanical Engineering Technology (MET) | SAIT

- Modeled a complete low-differential Stirling engine in SolidWorks, producing a fully constrained multi-part assembly with correct kinematics, alignment, and motion behavior
- Generated a full manufacturing drawing package (17 sheets) including tolerances, fits, materials, fasteners, and assembly references, interpreted per ASME Y14.5 standards
- Individually manufactured all assigned components using manual lathe and milling operations, applying deburring, surface finish control, and dimensional verification to ensure proper fit and function
- Assembled and commissioned a fully functional engine, achieving a measured operating speed of 262 RPM, validating design accuracy, tolerances, and assembly quality
- Troubleshot fit, friction, and alignment issues during assembly to ensure smooth rotation, sealing integrity, and repeatable operation
- Applied craftsmanship and finishing standards to all parts, balancing manufacturability with performance and reliability
- Presented the CAD model as a team, manufacturing approach, and performance results, explaining design intent, trade-offs, and test outcomes to a technical audience
- Individually achieved 95.5% overall project grade; Team SolidWorks assembly evaluated at 83%.

CAD Portfolio – Multi-Assembly Mechanical Design [Personal Project]

Personal Engineering Project | 2025

- Designed and modeled complex multi-assembly mechanical systems by building fully constrained SolidWorks part and assembly models, to demonstrate mechanical reasoning beyond single-part CAD
- Expanded an inline-4 engine model into a V8 configuration by restructuring assemblies, mating logic, and symmetry relationships, demonstrating scalable design intent and assembly control
- Developed motion studies, exploded views, renders, bills of materials (BOMs), and GD&T drawings to clearly communicate fit, function, and assembly sequence, mirroring professional design documentation practices
- Applied ASME Y14.5 GD&T principles to control size, alignment, and interface conditions, ensuring designs reflected realistic manufacturing constraints
- Published the CAD portfolio at mikiyashaile.com, resulting in recognition by Dassault Systèmes / SOLIDWORKS and an official social media feature reaching 2,900+ views
- Generated industry engagement, with multiple engineers and designers reaching out directly to discuss design approach, modeling techniques, and collaboration opportunities

ENGINEERING & OPERATIONS SKILLS

Design & CAD
- SolidWorks (CSWA), advanced part/assembly modeling, GD&T (ASME Y14.5), technical drawings
- Motion studies, exploded assemblies, interference checks, rendering, manufacturability planning

Manufacturing & Prototyping
- Manual lathe and milling operations, precision machining to ±0.1 mm
- Fabrication, tolerance stack-up evaluation, mechanical fastening and assembly

Programming & Engineering Tools
- Python (Django, TensorFlow, PyTorch), MATLAB/Octave
- Git/GitHub, Excel (advanced functions), ProjectLibre/MS Project
- Adobe Photoshop (technical visuals, documentation)

Certifications

- CSWA – SolidWorks Associate | April 2024
- WHMIS 2025 | April 2025
- Class 5 Driver's License

WORK EXPERIENCE

Vice President | Mechanical Engineering Technology Association (META), SAIT | May 2025 - Present
- Led the "Wash Counter" hydro-powered handwashing timer initiative by coordinating concept development, faculty engagement, and proposal preparation, resulting in faculty approval and submission to the SAIT 88 Legacy Fund for a $1,400 project
- Designed and launched the club website using React and JavaScript to create an outward-facing platform for student engagement, improving visibility and accessibility of META events and initiatives
- Established external partnerships by initiating direct outreach and collaboration discussions with Commonwealth Bar and Enactus SAIT, expanding professional and development opportunities for club members

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Barista | Starbucks Coffee Company, Chinook Mall, Calgary AB | May 2023 – Present
- Trained two new team members by providing hands-on instruction in beverage preparation, customer service standards, and cash handling, reducing onboarding time and improving shift readiness
- Delivered consistent, high-quality customer service during high-volume periods, maintaining accuracy, speed, and cash accountability under pressure
- Resolved customer concerns by de-escalating conflicts and applying company service protocols, resulting in positive customer experiences and formal recognition from management
- Recognized through multiple management commendation letters for reliability, service quality, and teamwork

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Pianist & Sound Engineer | Agape International Church, 2220 39 AVE NE, Calgary AB
Paid | May 2025 – Present
- Performed as a pianist during live services and events by preparing and executing scheduled musical programs, supporting service quality and audience engagement

- Operated and managed live sound systems using an Allen & Heath MixWizard WZ16:2 analog mixer, to deliver clear, balanced audio during live services
- Configured microphones, monitors, gain structure, and signal routing to prevent feedback and maintain consistent sound quality, ensuring uninterrupted live events
- Troubleshot real-time audio issues under time-critical conditions, maintaining system reliability during non-repeatable live performances

VOLUNTEER EXPERIENCE

Computer Graphic Designer | Calgary Newcomers Guide, Franklin Atrium NE, Calgary AB

Volunteer Role | Jan 2025 - Present

- Designed digital graphics and promotional materials using Adobe Photoshop, Illustrator, and Canva, to translate organizational messaging into clear, accessible visuals for newcomer audiences
- Delivered approximately 5 finalized design assets by iterating based on stakeholder feedback and brand alignment, resulting in continued design requests and adoption by the organization
- Improved visual consistency by applying layout, typography, and hierarchy principles, supporting clearer communication across outreach materials