CURRICULUM VITAE

Mitchell Albert, M.A.Sc., P.Eng.

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EXPERT SUMMARY

Mr. Mitchell Albert is an Associate with the Materials and Product Failure team at 30 Forensic Engineering. He holds a Master of Applied Science degree in Materials Engineering from the University of British Columbia, where he developed a functioning prototype for a point-of-care biosensor for diagnostic applications. At 30 Forensic Engineering, Mitchell investigates a diverse range of product failures, mechanical system failures, and equipment failures. He is a licensed Professional Engineer in the province of British Columbia.

SPECIALIZED PROFESSIONAL COMPETENCIES

- Engineering Design and Product Failure
- Materials Science and Engineering
- Material and Mechanical Property Characterization
- Material Characterization and Chemical Analysis
- Plastics and Polymer Properties, Processing, and Failure Mechanisms
- HVAC Systems and Mechanical Breakdowns
- Microscopy and Fracture Surface Analysis
- Biomaterials and Biomedical Devices
- Electrochemistry and Electrochemical Characterization
- Technical Writing

ACADEMIC BACKGROUND

Master of Applied Science—Faculty of Materials Engineering, University of British Columbia, Vancouver, British Columbia, 2023

Bachelor of Engineering in Materials Engineering and Management, McMaster University, Hamilton, Ontario, 2021

ADDITIONAL COURSES

Failure Analysis for Injection Molded Plastic Products, The Pennsylvania State University, 2025

Handling Mechanical Failures, Steel Image, 2024

Basic Concrete Technology, ConcreteBC, 2024

PROFESSIONAL EXPERIENCE

30 Forensic Engineering

Associate, Materials and Product Failure
2023 – Present, Vancouver, BC

- Product liability investigations (property losses and personal injuries)
- Failure analysis of metal components (e.g., fatigue, corrosion, overload, stress failures)
- Plastic and polymer failures
- Concrete installation and performance failures
- Coating and sealant failures
- Glass failures
- Marine fuel system failures
- Piping and plumbing failures (e.g., over-pressurization, degradation, corrosion)
- HVAC and fire suppression system failures (e.g., fire system piping and sprinkler heads)
- Valve failures (e.g., degradation)
- Seatbelt effectiveness

University of British Columbia

Graduate Research Assistant, Materials Engineering
2021 – 2023, Vancouver, BC

- Developed a prototype for a point-of-care diagnostic biosensor.
    - Developed laboratory procedures for synthesis and characterization of nanoparticle thin films, photoelectrochemical cells, and DNA hybridization mechanisms.
    - Characterization techniques included optical and scanning electron microscopy, Fourier-transform infrared spectroscopy, nuclear magnetic resonance spectroscopy, ultraviolet-visible light spectroscopy, Mott-Schottky analysis.

Graduate Teaching Assistant
MANU 481: Manufacturing Processes, MTRL 456: Environmental Degradation of Materials
2022 – 2023, Vancouver, BC

- Created course materials, including exercises and term projects.
- Advised students on term projects.
- Graded course projects and examinations.
- Instructed course fundamentals and presented solutions to practice problems.

Bombardier Aerospace/DeHavilland Aircraft of Canada

Engineering Intern
2019 – 2020, Toronto, Ontario

- Performed failure analysis on in-service DHC DASH 8-400 aircraft.
    - Identified failure mode in mechanical components, such as hardware, skin panels, and hydraulic parts.
    - Used optical and scanning electron microscopy, energy-dispersive X-ray spectroscopy, hardness, and conductivity measurements to identify material and failure mode.
    - Authored reports that summarized the failure root cause and recommended action for internal and/or external use.

Woodbridge Foam Corporation

Engineering Student Research Assistant
2018 – 2018, Woodbridge, Ontario

- Researched methods of reducing and testing for volatile organic compounds in flexible polyurethane foam.
    - Independently developed procedure for foam sample synthesis and volatile organic compound testing using gas-chromatography mass spectrometry and high-performance liquid chromatography.
    - Trained in safe toxic chemical handling that involved cyanates and amine catalysts.

PROFESSIONAL SOCIETIES AND ASSOCIATIONS

- Engineers and Geoscientists of British Columbia (EGBC), Member
- ASM International, Member
- Failure Analysis Society, Member

AWARDS AND ACHIEVEMENTS

- Canadian Graduate Scholarships – Masters Program, The University of British Columbia
- Denton Coates Memorial Scholarship, McMaster University
- Neil Forsyth Prize, McMaster University

PUBLICATIONS

- Bonneville, DB., Albert, M., Arbi, R., Munir, M., Segat Frare, BL., Miarabbas Kiani, K., Frankis, HC., Knights, AP., Turak, A., Sask, KN., Bradley, JDB. (2023). Hybrid silicon-tellurium-dioxide DBR resonators coated in PMMA for biological sensing. *Biomedical Optics Express*.
- Albert, M., Clifford, AM., Zhitomirsky, I., Rubel, O. (2018). Adsorption of maleic acid monomer on the surface of hydroxyapatite and TiO2: A pathway toward biomaterial composites. *Applied Materials and Interfaces.*

PATENTS

- “Sensors for Detecting Target Nucleic Acids and Their Use,” World Intellectual Property Organization, 2024.

30 FORENSIC ENGINEERING SPEAKING ENGAGEMENTS

- Addressing Water and Mould Damage: A Case Study of a Multi-Disciplinary Forensic Investigation. PM Expo, The Buildings Show 2024.
- Water Losses in Condos & Office Towers (Accredited Seminar)
- Product Liability: Water Losses & Personal Injuries (Accredited Seminar)

ACADEMIC SPEAKING ENGAGEMENTS

- Albert, M. (2023). Multiplexed Nucleic Acid Analysis Using a Linear Polyethyleneimine Modified-Zinc Oxide Photoelectrode. American Chemical Society Spring 2023.
- Albert, M. (2018). Adsorption of Maleic Acid Monomer on the Surface of Hydroxyapatite and TiO2: A Pathway toward Biomaterial Composites. The Minerals, Metals and Materials Society 2018 Annual Meeting & Exhibition.