

Blake Tolmie

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Projects: <https://blaketolmie.github.io/>

I am a Mechatronics Engineering student at the University of Canterbury, specialising in electrical and embedded systems, with industry experience supporting utility analysis, electrical performance assessment, and project coordination within large-scale industrial operations. I have developed a strong technical foundation through practical experience in electrical energy analysis, system modelling, technical documentation, and project planning, alongside strong academic performance recognised through merit-based scholarships. I am currently completing advanced study in power electronics, embedded systems, and control, with a focus on applying these skills to electrical consulting, system optimisation, and project delivery. My final-year project reflects this direction: in partnership with INTEC Energy Solutions, we are investigating the technical and financial feasibility of a grid-connected or hybrid solar PV + BESS system through system architecture design, grid and energy modelling, and a commercial viability assessment. I am a New Zealand citizen with full Australian working rights.

Education

University of Canterbury, Christchurch

Bachelor of Mechatronics Engineering (Hons)

2023 – Present | Expected graduation: Nov 2026

Employment History

Summer Intern – Fonterra, Christchurch

Nov 2025 – Feb 2026

- Prepared a site-wide utility performance report using Seeq, analysing electricity, steam, chilled water, compressed air, and water to support cost forecasting and operational decisions.
- Reviewed and validated utility flow diagrams, metering schematics, and data tags to ensure analytical outputs reflected real plant behaviour.
- Built and maintained Seeq dashboards to visualise and trend utility usage across plant areas and operating states.
- Completed engineering calculations where direct measurement was unavailable, including estimation of chilled water energy use from flow and temperature data.
- Supported a data-driven optimisation project to reduce milk dryer wash (CIP) turnaround times using Seeq analytics and on-site observation.
- Designed and implemented a dynamic Excel-based Gantt planning tool to analyse wash and maintenance sequencing, dependencies, and downtime drivers.
- Developed a draft dryer wash SOP based on operator best practice and OEM (GEA) guidance, with several improvements implemented on-site.

Summer Research Intern – Auckland Bioengineering Institute (ABI), Auckland

Dec 2024 – Mar 2025

- Designed and developed an electrically driven soft bistable valve for regulating liquid metal flow in soft robotic actuators powered by a magnetohydrodynamic (MHD) pump.
- Integrated electropermanent magnets (EPMs) to enable energy-efficient bistable actuation without continuous power draw.
- Performed magnetic circuit analysis and modelling to optimise force output, switching behaviour,

and power consumption.

- Developed Python-based simulations to evaluate magnet configurations, actuation performance, and design trade-offs.
- Iterated valve concepts through simulation-driven design under physical and manufacturing constraints.
- Conducted detailed literature reviews on soft robotics, magnetic actuation, and bioengineering principles.
- Presented research outcomes through technical posters and public presentations to technical and non-technical audiences.
- Worked within an interdisciplinary research team alongside physicists and researchers.

University of Canterbury, Christchurch

Feb 2023 - Present

- Engineering New Zealand Student Ambassador — Appointed to represent student engineers and strengthen engagement between the University of Canterbury and Engineering New Zealand Te Ao Rangahau; promoted student membership, supported campus events and professional initiatives, and worked with Branch and Young Engineers committees to connect students with industry opportunities.
- UC Wine Club Vice-President & Cellar Master — Supported club operations and delivery of major events, including the 50th anniversary; managed cellar operations and coordinated committee and sponsor engagement.
- Teaching Assistant (ENGR101 & MATH101) — Delivered weekly workshops and mathematics labs for first-year engineering students; supported problem-solving, applied mathematics, and technical communication; assisted with assignment and exam marking.
- Mechatronics Engineering Mentor — Delivered weekly study sessions for second-year Mechatronics Engineering students; ran collaborative study groups and coordinated content review with course tutors.
- Mechatronics Engineering Ambassador (UniBuddy) — Provided written guidance to prospective students on the Mechatronics Engineering programme and student life at the University of Canterbury.
- Campus Tour Guide — Delivered campus tours and presentations to prospective students and families.

Stores / Forklift Driver – Solution Dynamics, Auckland

Oct 2022 – Feb 2023, Nov 2023 – Feb 2024

- Operated counterbalance and reach forklifts in a safety-critical warehouse environment.
- Managed stock movements and inventory using warehouse management systems.
- Coordinated with production and logistics teams to meet dispatch and operational deadlines.
- Supported workflow improvements to reduce handling delays and improve efficiency.

Boat Builder – Sealegs International Ltd, Auckland

Jan 2022 – Oct 2022

- Contributed to the manufacture of Sealegs' first 12 m RIB Cabin, supporting tube construction and assembly preparation.
- Performed surface preparation including sanding, gluing, buffing, and cleaning to meet strict quality standards.
- Conducted quality checks and adhered to strict health and safety procedures when handling hazardous materials.

Self-Employed – Roof Gutter Cleaning Business Owner, Auckland

Jun 2022 – Feb 2023

- Established and operated a small residential and commercial roof gutter cleaning business.

- Worked at height using fall arrest systems and managed on-site health and safety.
- Sourced clients, scheduled work, and managed end-to-end service delivery.

Beekeeper & Business Owner – The Bee Brothers & Co, Auckland

Jul 2015 – Jun 2022

- UC Wine Founded and operated a semi-commercial beekeeping business across Auckland.
- Managed hives across farms, private properties, and institutional sites including Massey University.
- DECA-approved beekeeper compliant with NZ AFB biosecurity and audit requirements.
- Delivered honey and propolis production, pollination services, queen cell grafting, and swarm collection.
- Specialised in mānuka honey production.

Projects

See my project portfolio at <https://blaketolmie.github.io/>

Scholarships and Awards

- **Ngāpuhi Education Scholarship (2024)**
The Ngāpuhi Education Scholarship supports students of Ngāpuhi descent who are committed to academic success and aspire to contribute their knowledge and skills to the wellbeing and development of Ngāpuhi whānau, hapū, and iwi.
- **NCEA Biology Scholarship (2018)**
The NCEA Biology Scholarship is a prestigious award offered annually to New Zealand secondary school students who demonstrate exceptional ability in biology. The scholarship is designed to identify and reward students who show advanced understanding, critical thinking, and the ability to integrate and apply biological concepts to complex situations.

Skills

- **Software & Tools:** AutoCAD, SolidWorks, Python, C, MATLAB (including Simulink), Excel, GitHub, VHDL / Verilog, COMSOL Multiphysics, KiCad, Altium, DiGSILENT PowerFactory
- **Embedded & Electrical:** Embedded systems fundamentals, ARM Cortex-M microcontrollers, power electronics principles, circuit analysis, instrumentation and measurement, LTspice simulation, PCB design
- **Engineering:** Electrical systems and utility analysis, energy calculations, system modelling, computer vision applications, technical documentation and reporting
- **Project & Delivery:** Project planning, scheduling (Gantt-based tools), multidisciplinary coordination, site-based work, client-facing communication

References

- Max Sheahan, Process Lead Darfield Powder Plant at Fonterra Co-operative Group Limited
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- Connie Searle, Line Manager Darfield Powder Plant at Fonterra Co-operative Group Limited
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- Grace Jones, University of Canterbury Recruitment Activities Co-ord
M +64 21 083 51118 gracel.jones@canterbury.ac.nz
- Bryan Ruddy, Senior Lecturer at Auckland Bio-engineering Institute
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- Written references can be found on my LinkedIn page or can be supplied on request