

HAMZA OBEIDI

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EDUCATION

Bachelor of Applied Science in Nanotechnology Engineering, University of Waterloo 2025–2030

Relevant Coursework: NE 140 Linear Circuits, NE 111 Python Fundamentals

Engineering Society NE '30 Representative; Nanotechnology Academic Representative

EXPERIENCE

Isotope Laboratory Research Assistant May 2026 – Sept 2026
University of Waterloo Waterloo, ON

- Operate, calibrate, and troubleshoot analytical instrumentation including a gas chromatograph, diagnosing hardware and performance issues to maximize instrument efficiency.
- Prepare and analyze environmental DIC and DOC samples, applying instrument diagnostics and process troubleshooting to ensure measurement accuracy.

Bio-mechatronics Systems Design Oct 2025 – Current
University of Waterloo Biotron Waterloo, ON

- Defined system architecture, requirements, and interfaces across sensors, actuators, motor drivers, and control.
- Wrote design specifications to guide component selection and hardware–software integration.

Quality Assurance Analyst Oct 2023 – Jan 2024
TAMVOES Health Kitchener, ON

- Tested backend edge cases and failure modes to identify and document bugs, improving reliability.
 - Reported findings to cross-functional teams to support iterative website improvements.
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PROJECTS

EMG-Controlled Robotic Hand (Microcontrollers, Analog Circuit Design, DSP, Servo Actuation)

- Designed and built an EMG signal acquisition circuit from scratch using an AD8221 instrumentation amplifier and filtering stages to amplify microvolt-level muscle signals.
- Developed embedded firmware on Arduino microcontrollers to process real-time EMG signals from forearm surface electrodes into proportional servo motor control of a robotic hand.
- Rebuilding the signal chain as a tested DSP pipeline with CI, and reimplementing rectify → smooth → PWM in Verilog RTL in simulation (in progress).

ConnectEDU (Full-Stack Development, APIs)

- Built a full-stack web platform at a hackathon that replaces ad hoc guidance-counsellor scheduling with a structured appointment-booking flow on the Google Calendar API.
- Integrated an LLM-powered chatbot trained per school and district so each institution's bot answers students with its own rules, automating information access through REST APIs.

Triboelectric Nanogenerator (Circuit Design, SolidWorks)

- Designed and 3D modeled a triboelectric nanogenerator in SolidWorks to harvest wind energy.
 - Explored small-scale, low-power electricity generation for energy-harvesting applications.
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SKILLS

Embedded & Electronics	Microcontrollers (Arduino, ESP32), Motor Drivers, Servo Control, Analog Circuit Design, DSP, PCB Design (KiCad)
Programming	C, C++, Python (NumPy, Pandas, SciPy), MATLAB, Java, SQL, Verilog (learning)
Engineering & Design Tools	SolidWorks, AutoCAD, KiCad, Embedded Systems
Laboratory	Instrument Calibration & Troubleshooting, Microfabrication, Research and Development