

Espe Marchant Valenzuela

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SKILLS

Programs: Autodesk Inventor, SolidWorks, MS Excel

Languages: Python, MATLAB, Java

Laboratory: Cell Culture, Aseptic Technique, Pipetting, Molecular Biology Techniques, Experimental Design

Technical: CAD, Prototyping, 3D Printing, Mechanical Testing (Compression, Tensile, Three-Point Bend), Sensor Integration, Embedded Systems (Raspberry Pi), Breadboard Wiring, Data Analysis, Technical Documentation

EXPERIENCE

Communications Assistant

Apr 2026 – Present

McMaster Department of Anesthesia

Hamilton, ON

- Interviewing researchers and summarizing recently publicized research for the newsletter and social media
- Responding quickly and accurately to email and inbox communications from faculty, staff, residents, and fellows
- Organizing data in Excel to generate insights for the department's 5-year review

Vice President, Marketing

Nov 2025 – May 2026

McMaster iBioMed Society

Hamilton, ON

- Led a 7-member team across social media, merchandise, and event initiatives
- Grew society reach through on-brand content strategy with up to 200K+ monthly views ([@ibiomedociety](#))

Camp Counsellor

June – Aug 2025

City of Markham

Markham, ON

- Supervised groups of 7–32 children at day camps across the city, maintaining a 7:1 camper-to-counsellor ratio
- Delivered and independently developed weekly program plans, accounting for resource availability and weather

Volunteer Liaison, Programming

May 2023 – 2026

University of Toronto Science Rendezvous

Toronto, ON

- Coordinated volunteers by answering questions, resolving issues, and ensuring smooth event operations
- Led hands-on science and engineering demonstrations for children ages 6–12
- Guided visitors with event navigation and responded to general inquiries

PROJECTS

Embedded Drowsiness Detection System | IBEHS 1P10 Design Project

Jan – Feb 2026

- Set up a Raspberry Pi and wired all breadboard circuits, connecting an IMU orientation sensor and 5 actuators (servo, DC motor, LEDs, buzzer, vibration motor) via GPIO
- Wrote Python to read live head-angle data from the sensor and smooth noisy readings using a rolling average
- Programmed alerts to activate based on drowsiness level detected from sensor data

Custom Orthopaedic Implant Design | IBEHS 1P10 Design Project

Oct – Dec 2025

- Extracted anatomical measurements and built iterative 3D CAD models (stem, head, liner, acetabular cup)
- Built full implant assemblies and produced rapid prototypes via 3D printing to assess structural feasibility
- Documented design iterations and technical rationale in a Design History File to ensure traceability
- Literature review on biomaterials and fixation biomechanics; applied findings to patient-specific implant design

EDUCATION

McMaster University

Expected 2030

Bachelor of Engineering Candidate, Mechanical & Biomedical Engineering

Hamilton, ON

Projects: Conceptual baicalin-eluting lens for cost-efficient, non-invasive glaucoma treatment

Activities: iBioMed Society; Women in Engineering Mentorship Program; McMaster Engineering Competition

CERTIFICATIONS & AWARDS

Programs: Health Innovation Bootcamp, The Clinic, McMaster University, Spring 2026; Quantum School for Young Students, Institute for Quantum Computing, University of Waterloo, 2025

WHMIS 2015: McMaster University, Sept 2025

Standard First Aid and CPR C with AED: SAJE Vital Signs, Nov 2024