Lyra Fletcher (She/Her) **Mechanical Engineering**

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TECHNICAL SKILLS

Programming Languages
- C, C++, Java
- Python
- MATLAB
- HTML

Design and Robotics
- SolidWorks
- LightBurn
- LinuxCNC
- Arduino
- Bambu Studio

Manufacturing
- Welding – TIG, MIG
- Laser Cutting
- 3D Printing
- General Machining: lathe, chop saw, drill press, band saw, etc.

EDUCATION

University of British Columbia **Expected Graduation: May 2028**
Bachelor of Applied Science – Mechanical Engineering, Mechatronics
CGPA: 89.5%

Certifications:
- Red Cross First Responder 2023
- First Aid and CPR C Instructor 2023

OTHER WORK EXPERIENCE

Alert Bay Drug Store, Alert Bay, B.C. **June 2018 – Present**
Summer-time Clerk & Pharmacy Assistant
- Assisted in the dispensary preparing and delivering prescriptions to patients.
- Digitized freight invoicing system to streamline product receiving and reduce paper usage.
- Collected payments and facilitated the sale of merchandise and BCLC Lottery Tickets efficiently as the only clerk.
- Independently learned HTML to develop and maintain the store website as well as implement an online ordering system during the pandemic.

Cheslakees Elementary, Port McNeill, B.C. **October 2020 – June 2021**
Youth Reading Mentor
- Developed individualized learning plans for kindergarten students requiring additional support learning basic reading, writing, and math skills.
- Provided mentorship and emotional support to children with learning disabilities.
- Aided kindergarten teacher in running a classroom of 25 children, providing support during classroom activities and pre-class preparations.

TECHNICAL PROJECTS

Automated Naloxone Injector, Personal Project **June 2020 – June 2024**
- Developed wearable Narcan Naloxone administrator to combat the opioid epidemic, as nearly 80% of more than 115,000 deaths annually occur when the patient is alone.
- Used pulse oximetry biometrics, collected from a self-made Arduino wrist-oximeter, to monitor patients' blood-oxygen levels and determine, by hypoxic analysis, if an overdose is occurring.

- Used SolidWorks and Bambu studios to 3D print casing to house PCB and linear actuator injection components.

Parking Assist Sensor, Personal Project **June 2024 – August 2024**

- Designed a measurement tool to aid drivers with forward stall parking by indicating the distance from various points on the front bumper to an obstacle.
- Integrated multiple ultrasonic distance sensors using Arduino with a Bluetooth display, housed in a Bambu Lab designed and 3D printed case.
- Utilized Matlab and Python software to develop distance algorithms and account for parallax.

ENGINEERING STUDENT TEAMS

Thunderbikes, University of British Columbia **September 2023 – Present**
Battery Project Lead – Mechanical Sub team

- Currently working to develop an all-electric racing motorcycle, most recent iteration won first in the 2024 Motofest of Monterrey Formula Lightning Class.
- Collaboratively designed and manufactured a motorcycle dynamic stand and upper and lower battery case frames using SolidWorks as well as physical machining skills of MIG/TIG welding and use of general machine shop tools.
- Independently designed and manufactured motorcycle cooling circuit connecting radiators, battery, motor, pump, and motor controller with aluminum hose barbs using Lightburn laser cutting, LinuxCNC, and a lathe.
- Ran finite element stress tests and fluid dynamics simulations on models using SolidWorks.

VOLUNTEER EXPERIENCE

UBC Foundation of International Medical Relief, Vancouver, B.C **September 2022 – Present**
President (2024 – Present), Vice President (2023 – 2024), Secretary (2022 – 2023)

- Fundraised over $4500 for FIMRC Project sites in the period of 2022-2024.
- Assisted with giving vaccinations, medications, and clerical duties in the FIMRC Alajuelita clinic in May 2023 as a First Responder.
- Assisted in CPR training, glucose values collection and training, and blood pressure values collection and training in the FIMRC Anconcito clinic in May 2024 as a First Responder and First Aid Instructor.
- Organized and assisted in multiple CPR and naloxone training seminars for the UBC community.

UBC Dance Club, Vancouver, B.C **September 2022 – Present**
External Vice President (2023 – Present), Secretary (2022 – 2023)

- Organized and executed mini “Intro to Ballroom” lessons aimed at introducing First Year students to Ballroom Dancing.
- Handled all public relations for the club including obtaining and upholding sponsorship agreements as well as designing new merchandise for club promotion.
- Worked to connect the UBC and Vancouver Ballroom communities by hosting social dancing events throughout the city.

AWARDS

UBC Schulich Leadership Scholarship - $80 000 2022
McEwan Family Biomedical Entrance Scholarship - $25 000 2023

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September 21, 2024

Dear UBC Department of Mechanical Engineering,

My name is Lyra Fletcher, and I am currently in my second year of Mechatronics-Mechanical Engineering at the University of British Columbia, where I intend to enter the biomedical industry in precision medical robotics. Through my annual international volunteer work as a certified First Responder and First Aid Instructor, I have developed an understanding of how personalized medical devices can address everyday healthcare challenges and began applying that insight to the UBC Engineering community and the UBC community.

Having grown up in a rural First Nations village, I saw first-hand how the opioid epidemic rippled through my community. These devastating impacts inspired me to innovate my Automated Naloxone Injector. Designed to administer up to three doses of naloxone, it uses a series of linear actuators and Arduino and a self-built wrist pulse-oximeter to provide oxygen saturation biometrics. This project allowed me to learn various skills independently, from developing CADs, 3D printing, programming, and mechanical and electrical system construction - fundamentals of robotics. This project ignited my passion for programming and helped me realize my desire to build tangible systems with the goal of helping others. As the President of the UBC Foundation for International Medical Relief of Children, I took these skills of recognizing the needs and wants of stakeholders and applying them to my work volunteering internationally in communities with vastly different cultures, furthering my leadership abilities.

Studying at UBC has allowed me to explore these interests further; for example, by joining the UBC Thunderbikes mechanical sub-team, and now acting as the Battery and Cooling Lead, I was tasked with designing and implementing a liquid cooling system linking our pump, motor, and motor controller. As a result, I developed an energy-efficient cooling system that met the heat dissipation requirements for short but intense motorcycle races. I improved my technical skills by participating in all aspects of the design process: developing my CAD design and simulation abilities and machine shop skills, all of which apply to the design and prototyping requirements of a mechanical engineer. Interpersonally, I participated in a design review with the electrical and mechanical sub-teams and collaborated effectively with the electrical sub-team to integrate my design into their existing and unfamiliar system, improving my ability to work with a team and communicate with people specialized in different areas of engineering.

In my spare time, I act as the External Vice President for the UBC Ballroom Dance Club, teaching a variety of classes to the UBC student body and furthering my dance ability by attending competitions.

Post-graduation, I aspire to follow an entrepreneurial path and launch a biotech company focusing on integrating robotics into healthcare. I will use the knowledge and skills I am developing at UBC to make a meaningful impact on the lives of others. Although this path is ambitious, I believe UBC Engineering is the best place for me, and I am committed to seeing my dreams come true. Any scholarships would greatly aid in my journey to becoming a Mechanical Engineer. Thank you for your consideration of my application.

Sincerely,

Lyra Fletcher