

# Samuel Petrina

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## Summary

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Driven Mechanical Engineering student at Queen's University, equipped with excellent hands-on skills from work and design-team experience. Demonstrated ability to work effectively both independently and as part of a multidisciplinary team. Skilled in utilizing CAD software, conducting simulations, and writing code to optimize designs. Seeking a co-op role in the automotive industry to leverage my practical expertise and passion for mechanical design.

## Education

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**Queen's University** | Kingston, ON  
BS Mechanical Engineering – GPA: 4.1/4.3

*Expected Graduation: April 2025 (including co-op term)*

## Work Experience

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### **Hydrogen Technology & Energy Corporation | Vancouver BC**

*Applications Engineering Co-op*

*May 2023 – August 2023*

- Completed high-level preliminary calculations to assess green hydrogen production facility project feasibility
- Assisted with cost-benefit analyses for production facility projects using lifetime rate of return method
- Developed, maintained and updated project budget and expenditure spreadsheets
- Evaluated possible suppliers and contractors based on project and company needs

### **Queen's University – Reactor Materials Test Laboratory | Kingston ON**

*Research Assistant*

*May 2022 – August 2022*

- Designed a miniature tensile-testing stage weighing under 1 kg for use inside an X-ray diffraction machine
- Prepared an accurate and complete Solidworks CAD assembly of tensile stage to ensure manufacturability and mass constraints were met
- Completed a variety of FEA simulations in ANSYS to ensure total load-frame deflection remained under 0.5% of sample gauge-length allowing for accurate sample elongation
- Proved feasibility of joule-heating system capable of temperatures up to 600° C using an ANSYS thermoelectric simulation and electrical calculations completed in Python
- Wrote technical documentation for the tensile stage project to allow for project funding applications

### **Solaris Properties Construction | Vancouver BC**

*Carpenter Helper*

*May 2021 – August 2021*

- Supported carpenters in a wide range of areas, including concrete work, finish carpentry, framing, and roofing
- Selected and purchased materials as needed on site

### **Kettle River Timberworks | Burnaby BC**

*Labourer*

*Summer 2018, 2019 & 2020*

- Assisted in the installation of heavy timber in high-end residential and commercial construction
- Helped with preparation for remote construction projects including packing tools and purchasing material

## Extracurricular Experience

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### Queen's Formula SAE Design Team | Kingston ON

September 2020 – Present

#### Vehicle Dynamics Team Lead

- Led the design of the suspension, steering, and brakes system for an open-wheel race car with a total budget of over \$60,000
- Ran meetings, allocated tasks, and managed training for the vehicle dynamics sub-team consisting of 8 members
- Coordinated with other section leads to ensure proper integration between subsystems, adherence to deadlines, and rules compliance
- Worked with machine shop staff and faculty manager to ensure work on the car was completed in a safe manner
- Developed and implemented Solidworks best practices focusing on editability and software performance

#### Vehicle Dynamics Team Member

- Led suspension and steering kinematic design successfully reducing turning radius by 24% while optimizing for manufacturing and installation simplicity
- Designed a unique bevel-gearbox actuated steering system to enable complete flexibility of steering geometry will simultaneously reducing part count by 30%
- Designed a welded suspension wishbone allowing machining time to be reduced by 80% compared to the previous design through the elimination of tight-tolerance features and total milling setups
- Wrote a suspension load MATLAB script to simplify the structural analysis process for suspension parts
- Manufactured a variety of suspension and steering components using both manual and CNC machines

### Kitsilano Secondary

September 2018 – June 2020

#### Peer tutor

- Tutored students who needed extra help, specifically focusing on math, physics, and chemistry
- Provided in-class instructional help for grade 8 math students

## Awards

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| • Received The Ontario Professional Engineers Foundation Scholarship valued at \$1,500 | July 2023  |
| • Received The McLean Family Award in Student Design valued at \$5,000                 | June 2023  |
| • Dean's Scholar - Awarded to students with a GPA above 3.5                            | 1 <sup>st</sup> , 2 <sup>nd</sup> & 3 <sup>rd</sup> year |
| • NSERC Undergraduate Summer Research Grant Recipient                                  | April 2022   |
| • N.F. Dupuis Prize Scholarship - Awarded for exceptional standings in mathematics     | August 2021  |
| • Received The Queen's University Principal's Entrance Scholarship valued at \$2,000   | September 2020   |

## Skills

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- **Design and Analysis:** Solidworks, PDM, ANSYS, Simulink, GD&T, Limits and fits
- **Programming:** Python, NumPy, Matplotlib, SciPy, Pandas, MATLAB, C++, Java, GitHub
- **Electronics:** Arduino, soldering, implementation of digital and analog sensors
- **Manufacturing:** CNC and manual machining, metal fabrication, MIG welding, carpentry tools

## Personal Interests

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- Outdoor recreation including skiing, climbing, and hiking
- Woodworking
- Motorsports
- Cooking