

# Hardware Lead - Liquid Rocket Engine

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## Description

SFU Rocketry is seeking an exceptional individual to become the Hardware Lead for our Liquid Rocket Engine (LRE) project. This team is responsible for developing the main electrical control and feedback systems involved in SFU Rocketry's primary project. As the Lead of this team you will report to the Director of Hardware Systems, and your tasks will primarily be managing the direction and execution of the hardware aspects of the LRE project, as well as collaborating with the other Leads and members of other subteams involved within the LRE project. Your duties will also involve working on technical tasks with the Senior and Junior Designers on the LRE team, and aiding members in our various LRE subsystem teams in reviewing their designs. This team is at the forefront of the technology being developed by SFU Rocketry, and is currently upgrading our main control system with new hardware, improving data acquisition and controlled actuation of solenoids and turbopumps, regenerative cooling, and eventually producing hardware for flight-capable rockets. This position is an excellent opportunity to enhance leadership and management skills not taught in technical degrees.

## Duties & Responsibilities

- Manage the direction, execution, and completion of all LRE project hardware tasks
- Lead and inspire the Senior and Junior hardware members within the project
- Foster a team environment that promotes a healthy culture, positivism, engagement and retention
- Collaborate and communicate with other leads and subteam members within the team
- Meet to provide updates and represent your team with the Director of Hardware Systems
- Conduct PCB design reviews within the LRE subteam
  - Prepare members for formal design reviews led by the Director of Hardware Systems
- Assist Senior and Junior hardware members in their tasks if/when needed:
  - Determining requirements and specifications for new projects
  - Architecture of the main electrical control system and subsystems
  - Schematic capture, PCB layout, PCB assembly
  - Testing and validation of hardware systems
  - Integration of validated hardware into main LRE system
  - Implementing design changes and improvements to existing hardware
- Contribute with a minimum of 6 hours of work and 2 hours of meetings per week

## Key Qualifications

- Team leadership experience
- Product management experience is an asset
- High level of professionalism
- Unifying, motivating, and inspiring
- Knowledge of performance metrics is an asset
- Self-starter, inspired to initiate action
- Extensive electrical circuit and microelectronics knowledge (ENSC 320+325 suggested minimum)
- Strong experience in Altium Schematic and PCB Design Software
- LTspice experience

- Basic understanding of signal integrity (SI) and PCB concepts (impedance matching, reflection avoidance, ground loop prevention, shielding, layer stackups, etc)
- Understanding of PCB manufacturing and assembly processes is a strong asset
- Serial communication protocols (SPI, I<sup>2</sup>C, UART, etc)
- Basic embedded systems knowledge (Processor architecture, Raspberry Pi, Arduino, etc)

## Education & Experience

- Students pursuing an Electronics Engineering, Electrical & Computer Engineering, Mechatronics Engineering, or equivalent undergraduate or graduate degree at Simon Fraser University (preferred)
- Preference for third/fourth year if in undergraduate studies
- Preference for technical majors with business minors, or business majors with technical minors
- Faculty or staff members of Simon Fraser University are welcome to apply
- Preference for this role given to those with related experience in key qualifications, though all levels of experience are encouraged to apply

## Job Details

- Part-Time / Casual
- Volunteer Student Design Team Position
- Hybrid - Surrey SFU Engineering Building
- Commitment for a minimum of 9 months after onboarding
- Promotion opportunities for Director and Executive positions

## Statement from SFU Rocketry

SFU Rocketry is an inclusive and equal opportunity organization. We welcome, include, and respect all regardless of race, colour, ancestry, place of origin, religion, family status, marital status, physical disability, mental disability, sex, age, sexual orientation, gender identity or expression, political belief, or conviction of a criminal or summary conviction offence unrelated to employment.

SFU Rocketry is Simon Fraser University's largest active design team in the university's history, and has a strong reputation to uphold. Our members are highly sought-after and have been actively recruited for permanent and co-op intern industry positions. We operate as a professional organization, where professional conduct is required and expected from all SFU Rocketry members at all times.

## Learn More about SFU Rocketry

Visit our website - <https://www.sfurocketry.com>