

"GROWING THE FOOD OF THE FUTURE AT QUEEN'S UNIVERSITY"



QVFT

VERTICAL FARMING TEAM

HIRING PACKAGE

APPLICATIONS DUE MARCH 31ST, 2020

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Mechanical Engineer (3), Plant Specialist (3), Software Engineer (3), Technical Writer (1), Marketing Coordinator (1), Sponsorship Coordinator (1), Finance Coordinator (1)

5

CONTACT US

ABOUT US

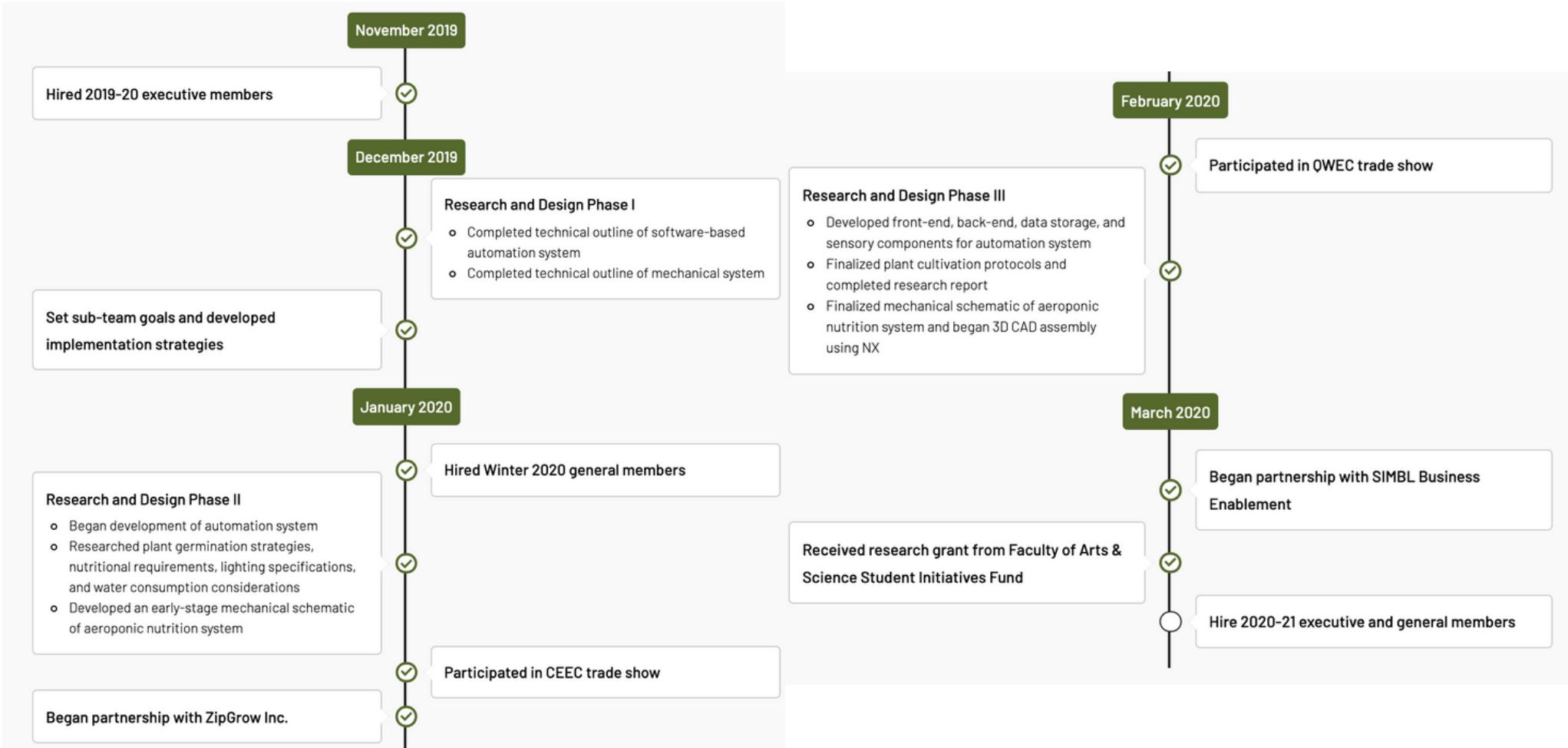
INTRODUCTION

Founded in Sep. 2019, QVFT is Canada's first student-led university vertical farming design team. Vertical farming is a hyper-efficient, sustainable food cultivation method which is projected to become a major contributor to global food production in the coming decades.

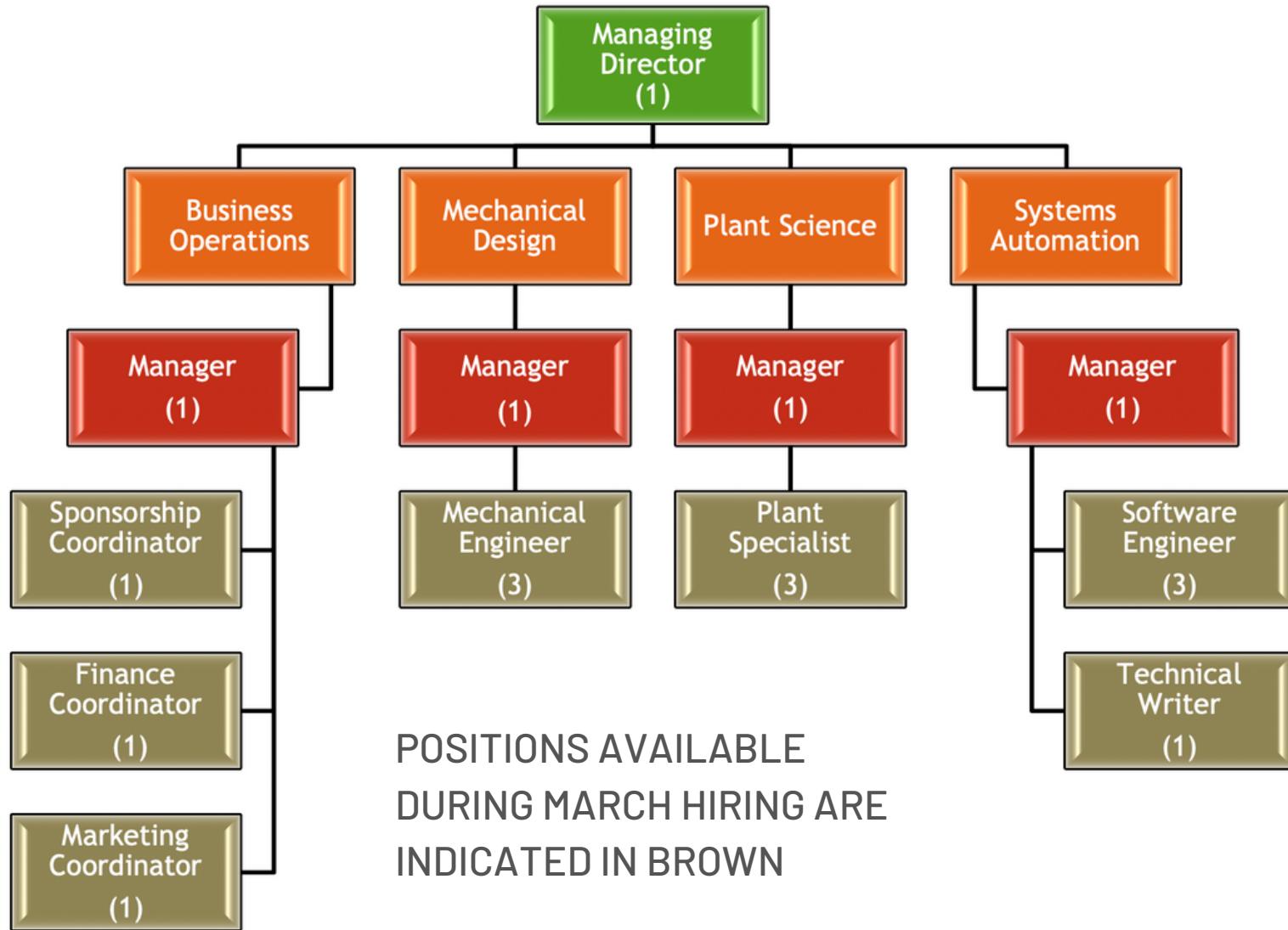
Our mission is to develop a functional, small-scale vertical farm. Drawing inspiration from the best current commercial practices, our goal is to gain a foothold as an innovator in a rapidly expanding industry.



PROGRESS



ORGANIZATIONAL STRUCTURE



WHY VERTICAL FARMING?

THE PROBLEM

Unsustainable agriculture has taken an enormous toll on the environment. Given the ongoing threat of climate change, global food security in the coming decades will largely depend on our ability to adapt and overhaul existing cultivation practices.

THE SOLUTION

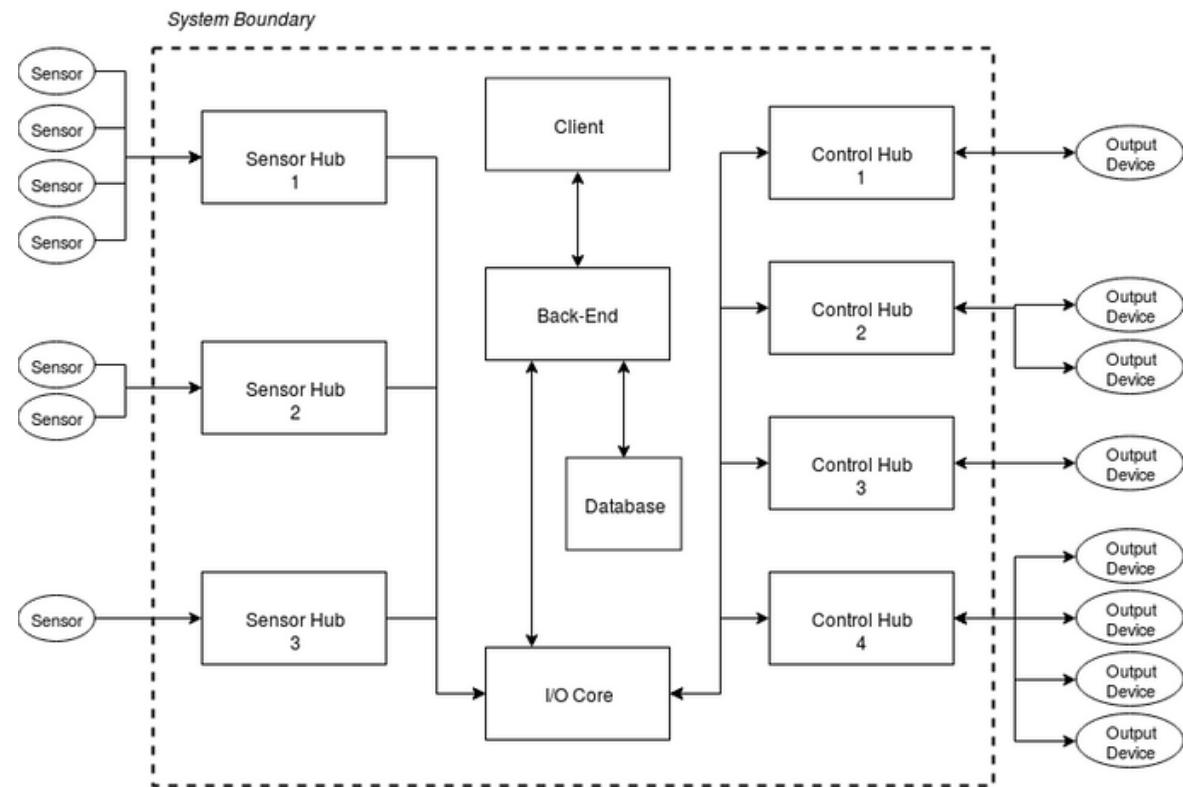
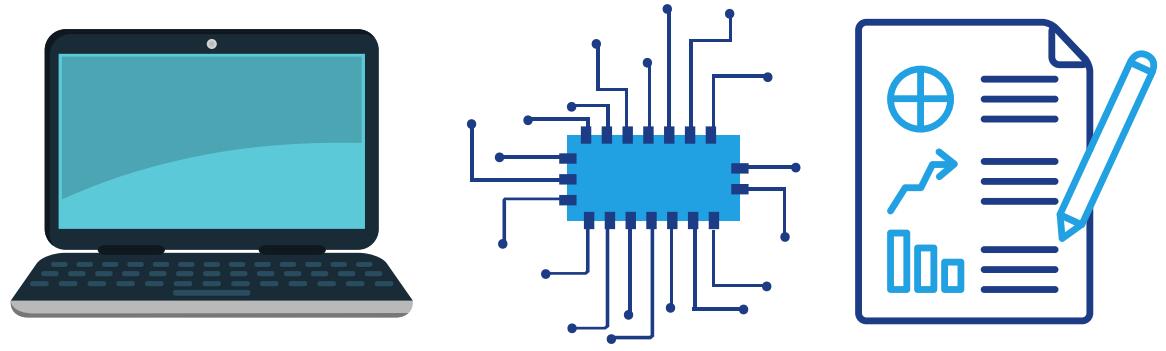
Vertical farming is a cultivation method in which crops grow in an indoor, urban, climate-controlled facility. This approach is associated with dramatically reduced water consumption, slashed transportation costs, organic produce, massive improvements in per-acre land productivity, increased plant productivity, and the freedom to cultivate crops in any location, year-round. These benefits are made possible through controlled-environmental agriculture (CEA), which allows for the artificial optimization of environmental inputs such as lighting, temperature, moisture, and nutritional availability.



WHAT WE DO

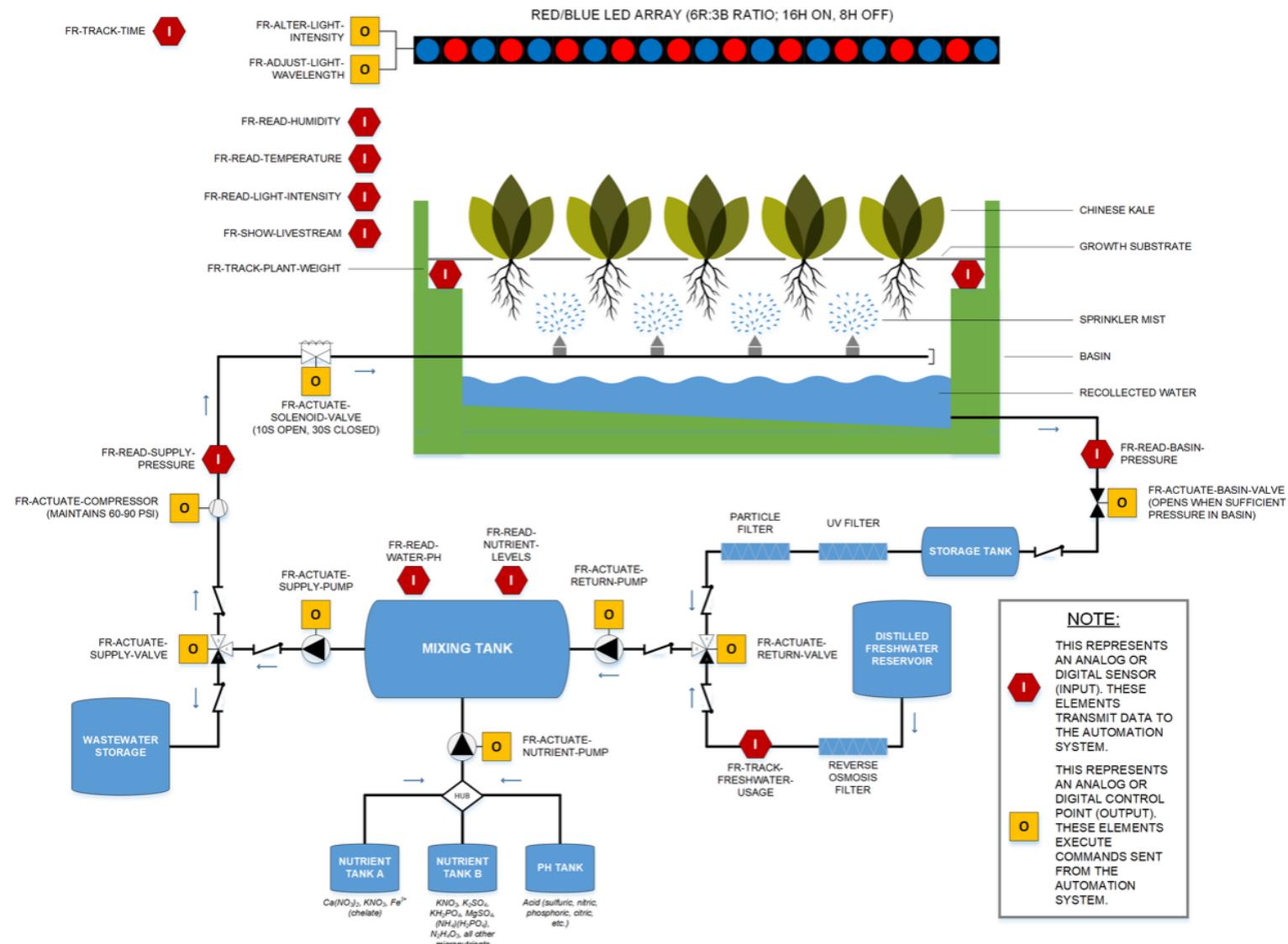
CONTROLLED-ENVIRONMENT AGRICULTURE

Controlled-environment agriculture (CEA) is a method of optimizing plant growth conditions by means of an integrated, software-controlled sensory network. Our proposed system (see right) aims to control, monitor, and maximize farming yield by comparing realtime environmental data to pre-set environmental targets, and adjusting the internal growing environment accordingly. The CEA system will serve as the central control hub for the lighting, irrigation, fertigation, ventilation, and climate control systems.



AEROPONICS

Aeroponics is a cultivation method in which nutrients are dissolved in water (fertigation) and misted directly onto roots via spray nozzles. Crops rest on a thin, porous substrate, through which their roots dangle in a basin below. Requiring no soil, this approach allows the grower near-complete control over the specific nutrient mix a plant receives. Shown at right is a current schematic of our proposed design.



HIRING INFORMATION

MECHANICAL ENGINEER

POSITIONS
AVAILABLE

3

WEEKLY
COMMITMENT
4–5 HRS

TARGET
PROGRAMS

- Computing
- Computer Eng.
- Electrical Eng.
- Other STEM

ROLES AND RESPONSIBILITIES

- Attending regular sub-team meetings and contributing to decision-making process
- Conducting research into best practices and technical standards
- Finalizing schematic design of mechanical (aeroponic) system, communicating design decisions to other sub-teams
- Developing custom parts via CAD and manufacturing methods
- Determining inventory required to build mechanical system
- Manufacturing and assembling prototype, in collaboration with other sub-teams

KEY SKILLS AND ATTRIBUTES

- Ability to work constructively within a team
- Ability to manage time and meet expectations
- Willingness to learn new concepts and improve skillset
- Required prior experience:
 - Firm conceptual grasp of core mechanical engineering concepts
- Optional prior experience:
 - Design teams
 - CAD (SolidWorks, Solid Edge, or NX)
 - Manufacturing methods (MECH 213)
 - Mechatronics
 - MATLAB
 - Microsoft Visio

PLANT SPECIALIST

POSITIONS
AVAILABLE

3

WEEKLY
COMMITMENT
2-4 HRS



TARGET
PROGRAMS

- Life Science
- Biology
- Chemistry
- Chemical Eng.
- Health Studies
- Environmental Sci.

ROLES AND RESPONSIBILITIES

- Conducting plant science research pertaining to the effects of controlled-environment agriculture (lighting intensity/wavelength modulation, nutrient ratios, etc.) on optimization of crop yield
- Assisting in overseeing all tasks related to the growing process (monitoring plant health, diagnosing plant diseases/issues, fine-tuning operational protocols, etc.)
- Attending two meetings per week (one full-team, one sub-team)

KEY SKILLS AND ATTRIBUTES

- Previous plant science, greenhouse, or indoor farming experience an asset
- Ability to collaborate and work as part of a team
- Comfortable with writing independent research reports
- Creative and strategic thinker
- Strong work ethic and communication skills

SOFTWARE ENGINEER

POSITIONS
AVAILABLE

3

WEEKLY
COMMITMENT
4-5
HRS



TARGET
PROGRAMS

- Computing
- Computer Eng.
- Electrical Eng.
- Other STEM

ROLES AND RESPONSIBILITIES

GENERAL

- Design and implement the software and hardware components of the automation system
- Attend weekly work sessions with the systems automation sub-team
- Attend weekly full-team meetings

DATA VISUALIZATION/UI SUB-TEAM (1)

- Use web technologies to build a web application for visualizing environmental readings
- The web application will accept user input and transmit it to the Back-End sub-system

BACK END SUB-TEAM (1)

- Build a RESTful web service for tracking environmental readings and targets over time
- The web service will transmit new environmental targets to the I/O sub-system

INPUT/OUTPUT DEVICES SUB-TEAM (1)

- Use micro-controllers, sensors, and output devices, to create a system that moderates the vertical farm's internal environment to achieve given environmental targets
- Receive new environmental readings from sensors and transmit the data to the Back-End sub-system

KEY SKILLS AND ATTRIBUTES

- Interest in system design or software architecture
- Interest in vertical farming and sustainability
- Willingness to learn new technologies
- Ability to work collaboratively as part of a team
- Optional prior experience:
 - HTML/CSS/Javascript
 - RESTful/web APIs
 - Arduino, Raspberry Pi, or another board/micro-controller
 - A front-end framework (React, Angular, Vue, etc.)
 - A back-end framework (Express, Flask, Django, etc.)
 - SAS (data analytics software)
 - Mechatronics

com

TECHNICAL WRITER

POSITIONS
AVAILABLE

1

WEEKLY
COMMITMENT
2-4
HRS

TARGET
PROGRAMS

- Social sciences
- Commerce
- STEM

Business items

ROLES AND RESPONSIBILITIES

- Synthesizing data recorded by automation system into weekly briefs for meetings
- Analyzing trends pertaining to cost efficiency, energy consumption, plant productivity, water consumption, etc., and identifying potential causes and areas for improvement
- Creating an end-of-semester research report which provides a high-level summary of all weekly reports, and identifies the system configurations that resulted in the greatest plant productivity and operational efficiency
- Collaborating closely with the mechanical, systems automation, plant science, and administrative sub-teams

KEY SKILLS AND ATTRIBUTES

- Passion for QVFT's mission and a willingness to learn new concepts
- Strong aptitude for producing clear, concise technical writing
- Previous experience (academic or otherwise) with statistics, economics, or data analysis
- Strong analytical skills, with an aptitude for making well-supported, logical, educated inferences
- Ability to manage time effectively and consistently meet weekly report deadlines
- Team-oriented, collaborative mindset

MARKETING COORDINATOR

POSITIONS
AVAILABLE

1

WEEKLY
COMMITMENT
2-4 HRS



TARGET
PROGRAMS

- Open to all (Arts, Commerce encouraged)

ROLES AND RESPONSIBILITIES

- Managing all promotional efforts
- Designing displays and presentations for conference trade shows and information nights
 - Includes overseeing printing and other related logistical considerations
- Social media promotion
 - Expanding our presence (# of followers) on LinkedIn and Facebook
 - Regularly posting progress updates on our social media feeds
 - Increasing awareness of QVFT throughout future hiring periods
- Attending two meetings per week (one full-team, one sub-team)

KEY SKILLS AND ATTRIBUTES

- Passion for QVFT's mission and a willingness to learn new concepts
- Strong, concise written communication skills
- An "eye" for visual design
- Strong attention to detail
- Strong time management skills
- Previous experience in marketing (or similar roles) an asset

SPONSORSHIP COORDINATOR

POSITIONS
AVAILABLE

1

WEEKLY
COMMITMENT
2-4 HRS



TARGET
PROGRAMS

- Open to all (Arts, Commerce encouraged)

ROLES AND RESPONSIBILITIES

- Identifying sponsorship opportunities and reaching out to relevant players in the industry
- Applying for internal and external research grants
- Maintaining relationships with existing partners and sponsors
- Attending two meetings per week (one full-team, one sub-team)

KEY SKILLS AND ATTRIBUTES

- Passion for QVFT's mission and a willingness to learn new concepts
- Strong, concise written communication skills
- Strong attention to detail
- Strong time management skills
- Previous experience in a sponsorship, marketing, sales, or industry outreach role strongly preferred

FINANCE COORDINATOR

POSITIONS
AVAILABLE

1

WEEKLY
COMMITMENT
2-4 HRS



TARGET
PROGRAMS

- Commerce
- Economics

ROLES AND RESPONSIBILITIES

- Overseeing, coordinating, and tracking all cash flows, which includes:
 - Grants and donations
 - Inventory orders
 - Licensing fees
 - Operational costs
 - Miscellaneous costs
- Overseeing team bank account and ensuring that no discrepancies exist between QVFT's internal financial records and external bank statements
- Attending two meetings per week (one full-team, one sub-team)

KEY SKILLS AND ATTRIBUTES

- Passion for QVFT's mission and a willingness to learn new concepts
- Strong attention to detail
- Strong time management skills
- Strong numeracy skills
- Previous experience with accounting, or a relevant previous extracurricular role

CONTACT US



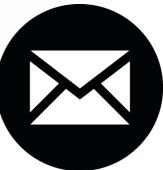
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