Programming Team

Robot Programming Sub Team

Focus on coding for all of the different subsystems of the robot including drive train, mechanisms, sensory input, vision and odometry for both the autonomous and driver controlled game periods utilizing Java.

Non-Robot Programming Sub Team

Responsible for all non-robot software with a focus on creation of yearly FORGE scouting app, the FORGE and main ATAA website, build space login system and integration of Social Media platforms into website.

Programming Team members could be involved with and exposed to:

- PID control loops
- Encoders
- Sensors
- Limit switches
- April Tag Detection
- Object Detection
- PathPlanner
- Limelight
- Arducam
- Database Design
- Web Design
- CAN Bus
- Raspberry Pi
- Google Coral
- Java
- NodeJS
- Rust
- C++
- C#
- HTML
- CSS
- Javascript
- Typescript

Business Team

Social Media Sub Team

Create and maintain ATAA social media platforms to cultivate our presence and grow our brand on social media with posts of team activities, upcoming events and competitions and assist with planning and running of events. Responsible for photography and videography in the build space, at events and at competitions to allow our families and sponsors to follow along on our journey.

Public Relations/Outreach Sub Team

Responsible for generating outreach opportunities to allow ATAA to represent FIRST in our community and region in order to expand our work beyond ATAA and make an impact on the world with robotics. Communicate with FIRST Alberta, local schools, local organizations and other FIRST Robotics teams to foster ATAA's involvement at Outreach events, to support FIRST and help it grow by ensuring ATAA maintains its role as a FIRST Ambassador.

Awards Sub Team

Responsible for gathering all data, preparation of required documents and judging presentations for any awards that FORGE plans to apply for in a given year as well as ensuring that our Impact Award database is kept up to date.

Business Team members could be involved with and exposed to:

- Twitter
- Facebook
- Instagram
- Digital design
- Videography
- Web Design
- Graphics
- Imagery
- Public Speaking
- Document Creation

Mechanical Team

Build Sub Team

Responsible for design, prototyping, fabrication, assembly, troubleshooting and maintaining of the robot. Involves the use of various hand and power tools. Responsible for installing all mechanical, electronic and pneumatic components and ensuring that there is ease of access and repair as well as overall robot stability and robustness.

Builder Sub Team members could be involved with and exposed to:

- Various hand tools
- Drill
- Drill press
- Horizontal bandsaw
- Vertical bandsaw
- Hydraulic press
- Vertical mill
- Chop saw
- Sander/grinder
- Jigsaw
- Table saw
- Pneumatic Systems
- Sensors
- Limelight
- Arducam
- Raspberry Pi
- Google Coral
- Wiring Schematic/Diagram
- Lubricants
- Solvents

Scouting Sub Team

Responsible for input into the creation of the FORGE Scouting App and guiding student and parent utilization of the App to gather robot performance and pit data on all robots at a competition in order to create a pick list for Alliance selection.

Scouting Sub Team members could be involved with and exposed to:

- FORGE Scouting App
- Photography
- Videography

Electrical/Controls Sub Team

Focus on integrating all electronics into the robot design by connecting all devices on the robot to their dedicated systems in a logical and clean way such that trouble shooting, repairs and maintenance are easy to accomplish. Involves understanding the various wire and connector types utilized for power, communication and control systems and creating custom wiring by being capable of terminating power, communication and control wires of varying gauges.

Electrical/Controls Sub Team members could be involved with and exposed to:

- PWM cables
- JST cables
- Ethernet cables
- USB cables
- CAN Buses
- WAGO connectors
- Lever Nut connectors
- Anderson Powerpole connectors
- Grasshopper connectors
- Hydraulic crimper
- Heat gun
- Soldering Iron
- Wire Strippers
- Wiring Schematic/Diagram
- Sensors
- Limelight
- Arducam
- Raspberry Pi
- Google Coral
- LED Strips

Strategy Sub Team

Responsible for facilitating game strategy development through a thorough understanding of the game in order to ensure that the robot design incorporates the necessary mechanisms and systems and provides input into match strategy at competitions.

CAD/CAM Sub Team

Responsible for utilizing CAD software to create sketches or models to provide visual feedback on proposed designs prior to fabrication, to create part and assembly models to test the viability of designs and ultimately to create the models from which the robot will be fabricated. Provide CAM output files for CNC and 3D Printer operators to produce robot parts.

CAD/CAM Sub Team members could be involved with and exposed to:

- OnShape
- Fusion 360
- Krayola CAD
- Solidworks
- Drawings and sketches
- Design reviews

CNC and 3D Printer Operators Sub Team

Responsible for operating and maintaining the CNC and/or 3D Printer to create parts as supplied by the CAD/CAM Sub Team. Deals with set-up and operation of a CNC and/or 3D Printer to produce parts while maximizing the use of materials including polycarbonate, aluminum and wood plus PLA, PETG, TPU, ABS, PET, PA, PC and Carbon Fiber filaments.

CNC and 3D Printer Sub Team members could be involved with and exposed to:

- G Code
- CAD software
- CAM software
- Slicing software

Safety Sub Team

Although safety and a clean build space is the responsibility of all team members, the Safety Sub Team ensures that the ATAA Buildspace is a safe and clean space and that ATAA students and mentors are following all safety processes and procedures. Responsible for creating safety posters, animations and videos and to be the ATAA Safety representative at all competitions.

Safety Sub Team members could be involved with and exposed to:

- Digital Design
- Chemicals

Competition Roles

At competitions, every FORGE team member has a critical role to play in our success as a team. Competition specific roles are available on the Drive Team and Pit Crew, and everyone is encouraged to apply for a position.

Competition roles are determined by Attendance, Attitude and Ability.

Drive Team

- **Driver** - Responsible for manning the robot around the field performing the roles agreed to by our alliance and usually some key aspects of the game such as shooting.
- **Operator** - Responsible for the main extensions of the robot such as an elevator or an arm.
- **Human Player** - Responsible for interacting with game pieces during the match.
- **Technician** - Assists with drive station setup, troubleshooting the robot and autonomous route discussions with alliance partners.
- **Media –** Responsible for recording all FORGE matches for post match reviews.

Every drive team role has a primary and a back up position.

Pit Crew

- **Pit Leads (2-3)** - Accountable for pit functionality during competitions to ensure that the robot is maintained, repaired and generally ready for every match. Responsible for battery management and testing. Main point of contact with the drive team to understand any issues or concerns with the robot that need to be addressed.
- **Pit Rotation Member (1-2)** - Responsible for keeping the pit area clean and safe, assist with checklist and repairs.

Other Critical Competition roles:

Scouting – gather match performance and pit data on all robots to create a pick list for Alliance selection. This is performed by all students and is critical to our success at competitions.

Outreach – provide help and assistance to any team that requires it and is performed by all students.

Business and PR - talk to other teams & judges about our business plan and impact book, the basics of all the sub teams and overall success stories/learning moments. Be in charge of putting out/handing out swag. Take photos/videos of the team and do social media posts.

Safety Lead – ensure students and mentors are wearing proper PPE for the job they are doing, that everyone is wearing safety glasses in the pits and that the first aid kit and battery spill kit are maintained and are packed for every competition.