

The Highlanders Present:

The

T.A.R.T.A.N.

(Training And Readiness: Teach, Appoint, iNteract)

Leadership Initiative



What is
the
TARTAN
Leadership
Initiative?

The TARTAN Leadership Initiative is a series of leadership models Highlanders follow as they grow on the team. Each Highlander progresses through each step and follow multiple paths to develop well-rounded leaders on their team and in their community that are knowledgeable in both Communication and Technical skills.



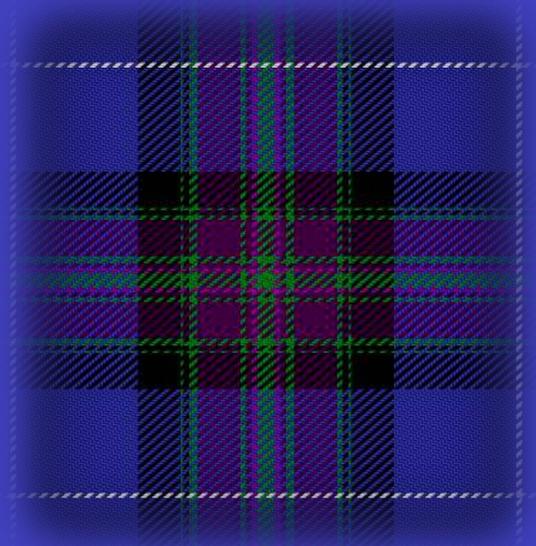
The TARTAN Leadership Initiative

Thank you for joining
The Highlanders in the
TARTAN Leadership Initiative.

Tartans are unique plaid patterns attributed to and worn by various Scottish clans. The tartans symbolizes their unity and their history. Similarly, this initiative seeks to bring teams together and share several models of a student leadership structure. This ties directly to The Highlander's Mission Statement: "To provide youth the opportunity to explore science, technology, engineering, and mathematics—through a hands-on experience and support in STEM."

The TARTAN Initiative allows teams to create a leadership family tree, building connections between alumni and students and creating a support network of technical, teamwork, and leadership skills for years to come.

The Highlanders believe that through the TARTAN model, students will not only develop significant real-world training and experience, but will also continue to contribute to the FIRST community as adults and FIRST Alumni.



The *TARTAN*

Leadership Initiative
consists of three models.

These models provide students
Training And Readiness for students
to meaningfully grow on the team and
change their communities.

Teach – The TARTAN
Development Model

Appoint – The TARTAN
Leadership Model

iNteract – The TARTAN
Community Model

The Pride of Scotland Modern Tartan

This tartan is a pattern that is not
associated with any Scottish clan. The
Highlanders wear this in addition to
their DNKE Sport Utility Kilts.



The TARTAN Development Model

The Highlanders believe well-rounded students will excel in life. Through the TARTAN Development Model, students follow pathways to learn skills in various areas of development.

The Highlanders have four areas of development: Mechanical*, Electrical*, Programming*, and Communications.

Highlanders are multi-faceted, with all students proficient in General Machinery and Advocacy, in addition to their selected areas of development.

We start our General Machinery training with all new students. Before touching any tools, we go over the SPORRAN Safety Program**, machine manuals, and FIRST Safety Manual. Students train with experienced team members before a mentor gives them the okay to run each piece of equipment.

*Technical development may vary by team.

**The SPORRAN Safety Program is available on the [resources page](#) on our team website.



Mechanical

General Machinery

- Hand tools
- Band Saws
- Drill Press
- Metal bender
- CAD

Intermediate Machinery

- Gcode
- Carbon Fiber
- Plasma Jet
- 3D Printer
- Manual Mill

Advanced Machinery

- CNC Mill
- Lathe
- Welding

Electrical

General Electrical

- Crimping
- Learning Components
- Pneumatics
- Soldering

Intermediate Electrical

- Board Construction
- CAD
- Sensors

Advanced Electrical

- Board Design
- Sensor Mounts
- Gcode
- Plasma Jet
- 3D Printing

Programming

General Programming

- Open Loop Control
- Sensor Integration

Intermediate Programming

- PID Control of Subsystems
- Vision Object Recognition
- Odometry

Advanced Programming

- Path Following
- Path Generation
- Vision Tracking
- Feed Forward Control

Communications

Advocacy

- Setting up demonstrations
- Presenting at events
- FIRST Team

Outreach

- Community Outreach

Documentation

- Safety
- Entrepreneurship/
Business Plan
- Chairman's Submissions

Media

- Recording Video
- Taking Photos
- Video Scripts
- Social Media
- Video Editing



The TARTAN Leadership Model

Leadership structure allows The Highlanders to bring out the best of their team member skills.

While the chart may make it seem that the students are split on either side, every student on the Highlanders has one or multiple roles on both the Strategy and Operational Safety & Excellence branches.

Team Captain

Captain - Ensures that entire team is focused on same goal and working to same schedule. Coordinates change process, so that OSE and Strategy teams work in tandem effectively and efficiently.

Strategy **Areas of Development:** Mechanical, Electrical, Programming

Leader - Responsible for integrating design, build, and programming to reach team objectives. Authority and central coordination for all strategic decisions regarding the robot. Guide team members on how to achieve robot objectives.

Robot Design / Build Team

Leader - Coordinating efforts to build the physical components of the robot.

- Maintaining build deadlines
- Areas include welding, CAD, CNC, electrical and mechanical build
- Ensure that shop remains stocked with necessary supplies

Programming Team

Leader - Responsible for coordinating the creation of a tele-op and autonomous program for the robot

Assistant - Supports leader, is knowledgeable in purpose of each program.

- Working with drive team to customize drive controls
 - Vision tacking
 - Motion Profiling

Drive Team

Coach - (Alumni or Mentor)

Responsible for facilitating match strategy discussions and

implementing them during the match

Leader - (Student) Responsible for leading match strategy discussions, keeping tabs on

drive team members, and ensuring robot cart has all tools/batteries

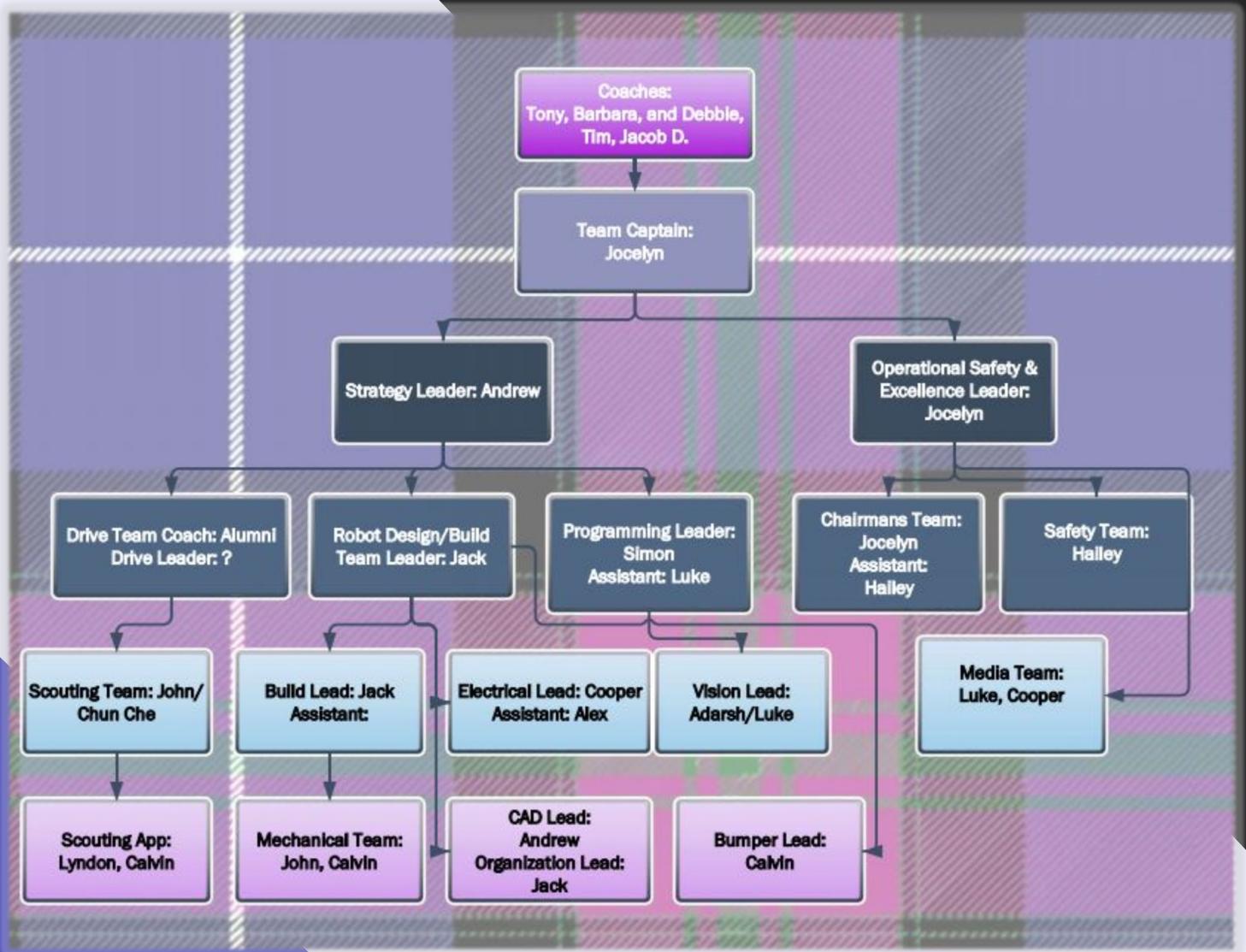
- Driving the robot at all matches

- Emergency robot repairs

- Working with other teams to discuss strategy

Scouting Team - Scouting other teams during matches

Scouting App - Developing a scouting application to use at competition and assisting in its use



Operational Safety and Excellence

Area of Development:
Communications

Leader - Responsible for facilitating discussions, reviewing submissions, keeping focus on team mission

Chairman's Team

Captain - Responsible for final review and submission of documents

Assistant - Supports captain, is knowledgeable in team history

- Completing Chairman's Submission
- Creating and implementing outreach ideas
- Writing and submitting awards

Safety Team

Captain - Responsible for final review and implementation of safety procedures

- Creating new safety initiatives
- Passing out safety and rookie kits at competition

Media Team

- Take video and photos during events
- Graphics design
- Social media outreach
- Produce team videos and documents

The TARTAN Community Model

The Highlanders have split up their outreach into three categories: local, far, and international, as well as two forms: short duration and long duration.

Using this model, community engagement can be better explained and we are more aware of our own limits. By balancing the short duration and long duration evenly, you can start to realize where you can place your impact: local, far, and international.

The local, far, and international categories do not necessarily define the commitment levels of your team, rather the short and long term forms play a larger role. This is something the Highlanders keep in mind, as by leveraging student's time and resources, our impact reaches many people, without regard to distances. An impact is an impact, whether it is local or beyond.

Through an outsized impact, The Highlanders make each communication and contact valuable. Each team member not only impacts several teams at a time, but the overall FIRST community.



The Forms

Short Duration

- Digital communication
- Daily event volunteering
- Expos
- [KILTS \(Kits That Inspire Leadership and Teamwork in STEM\) Program](#)

Long Duration

- Non-digital communication
- FIRST team Mentorship
- Running events

The Categories

Local outreach - Outreach in your city/school district

- Volunteering at local events
- Local demonstrations
- Opening your shop to local teams
- Mentoring younger teams in city/school district
- Themed events (Halloween Robot - #RobotDisguiseDay)
- Engaging with others in your community

Far Outreach - Outreach past your city/school district

- Volunteering at state events
- Mentoring teams in other school districts
- Multi-team events (Off season events, Large Expos)
- Engaging with others outside of your local community

International Outreach - Outreach outside of your country

- Day long demos/camps ([KILTS Program](#))
- Mentoring foreign teams
- Social Media Challenges and Communication
- Volunteering at foreign events (World Championships *if you are not from the US)



Who Are We?

The Highlanders (Team 4499) are a community based team that began in 2013 through a 501(c)3 nonprofit, Neaera Robotics in Fort Collins, CO. We are a team of 11 students from grades 8-12, 6 different schools, and 3 different cities. We build a robot to meet a different challenge each year and compete in a robotics competition put on by FIRST, an organization working to promote STEM education through *coopertition* —a combination of cooperation and competition — in students from ages 5 to 18. Our team's mission is: "To provide youth the opportunity to explore science, technology, engineering, and mathematics—through hands-on experience and support in STEM," (and to have fun building robots while we do it!)

