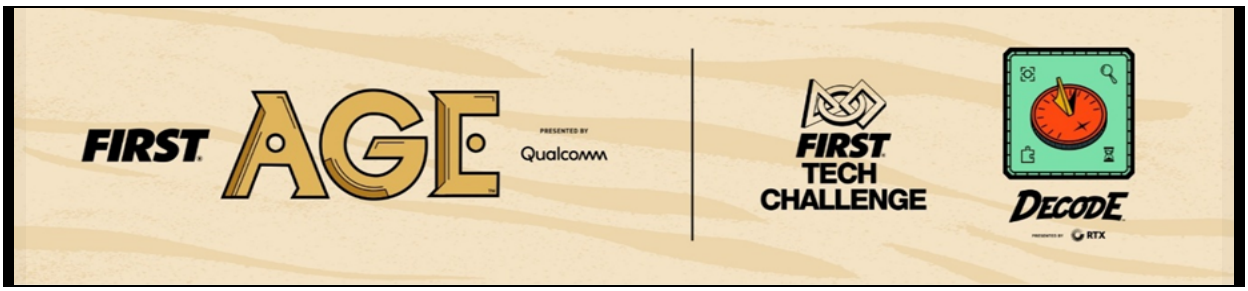



# Vermont Region Championship

*Saturday, March 7th*

*South Burlington High School*

Brought to you by

University of Vermont
College of Engineering
and Mathematical Sciences

FIRST IN VERMONT

# In This Program

# Keynote Speaker

## We are proud to welcome Colin Riggs


Colin Riggs is the Founder and CEO of Rigorous Technology, an industrial robotics company focused on bringing advanced robotic software technology on a modern control architecture to US manufacturers.

Prior to founding Rigorous, Colin Riggs led product development at Greensea IQ, a marine robotics company based in Vermont.

During his tenure at Greensea IQ, Colin developed the industry-leading robotic software platform for subsea robots.

He led dozens of integrations across the world and had the opportunity to work on programs including unexploded ordnance disposal, deep ocean research, utilities, and treasure hunting.

# About *FIRST*

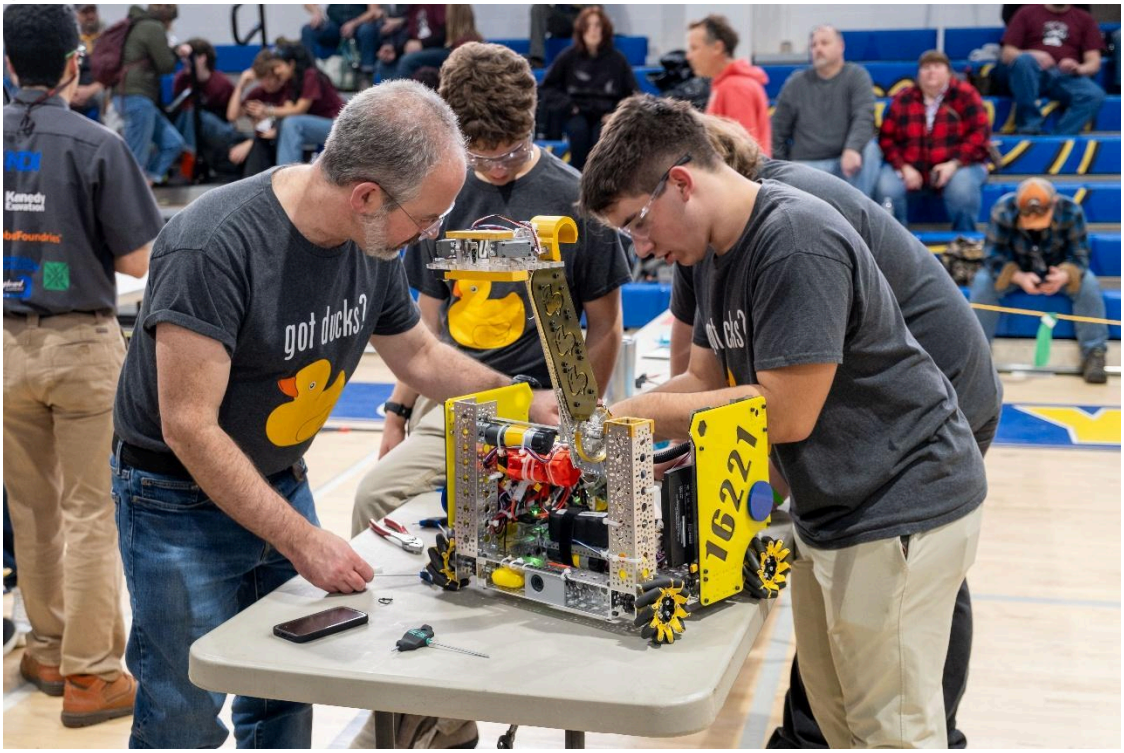
*FIRST*® *(***F**or **I**nspiration and **R**ecognition of **S**cience and **T**echnology) was founded in 1989 to inspire young people's interest and participation in science and technology. Based in Manchester, NH, the 501(c)(3) not-for-profit public charity designs accessible, innovative programs that motivate young people to pursue education and career opportunities in science, technology, engineering, and math, while building self-confidence, knowledge, and life skills.

*FIRST* is *More Than Robots*SM. *FIRST* participation is proven to encourage students to pursue education and careers in STEM-related fields, inspire them to become leaders and innovators, and enhance their 21st century work-life skills.

# About *FIRST* Tech Challenge

***FIRST*® Tech Challenge** is an exciting, fun, global robotics program for students in grades 7-12. Teams are responsible for designing, building, and programming their robot to compete in an alliance format with and again other teams. Using blocks-based or text-based coding and custom fabrication with 3D printing, teams program classroom-scale robots to follow autonomous commands before student drivers take control in two-on-two matches. Teams compete on and off the playing field for awards that celebrate robot design and performance, community outreach, *Gracious Professionalism*,® and sharing and spreading *FIRST* in their communities. Being on a *FIRST* team empowers students to:

- Think, explore, and project plan like scientists and engineers
- Have a fun, creative, and hands-on STEAM experience
- Experiment, iterate, and overcome obstacles
- Apply real life math and science skills
- Build self-esteem and confidence
- 90% of participating students report learning how STEM can solve real-world problems



# Event Schedule

| Start Time | End Time | Activity |
|---|---|---|
| 7:00 AM | 6:30 PM | Pit Area Open |
| 7:30 AM | 10:25 AM | Judging - Assigned time slots available at Pit Admin |
| 8:15 AM | | Robot inspections open |
| 8:15 AM | 4:00 PM | Practice fields open |
| 9:00 AM | 10:00 AM | Fields open for Calibration and Measurement |
| 10:15 AM | 10:30 AM | Drivers' Meeting |
| 10:30 AM | 11:00 AM | Opening Ceremony, Keynote |
| 11:00 AM | 12:30 PM | Qualification Matches |
| 12:30 PM | 1:00 PM | Lunch Break |
| 1:00 PM | 2:48 PM | Qualification Matches resume |
| 3:00 PM | | Alliance selection begins |
| 4:00 PM | 6:00 PM | Playoff Matches and Awards |

# Match Play and Playoffs

### During the Qualifying Matches

After all teams have gone through the robot and field inspections, they are randomly assigned into alliances of two teams. A team's alliance partner in one match may be their opponent in another match.

### Team Rank

During the qualifying matches, all teams will be ranked from first through last based on their Ranking Score (RS). The following table shows how teams are ranked in order:

| Order Sort | Criteria |
|---|---|
| **1st** | RANKING SCORE (RS) – Average Ranking Points |
| **2nd** | Average ALLIANCE AUTO Points |
| **3rd** | Average TELEOP ALLIANCE ASCENT Points |
| **4th** | Highest MATCH Score (including FOULS) |
| **5th** | Random sort by the *FIRST* event management software |

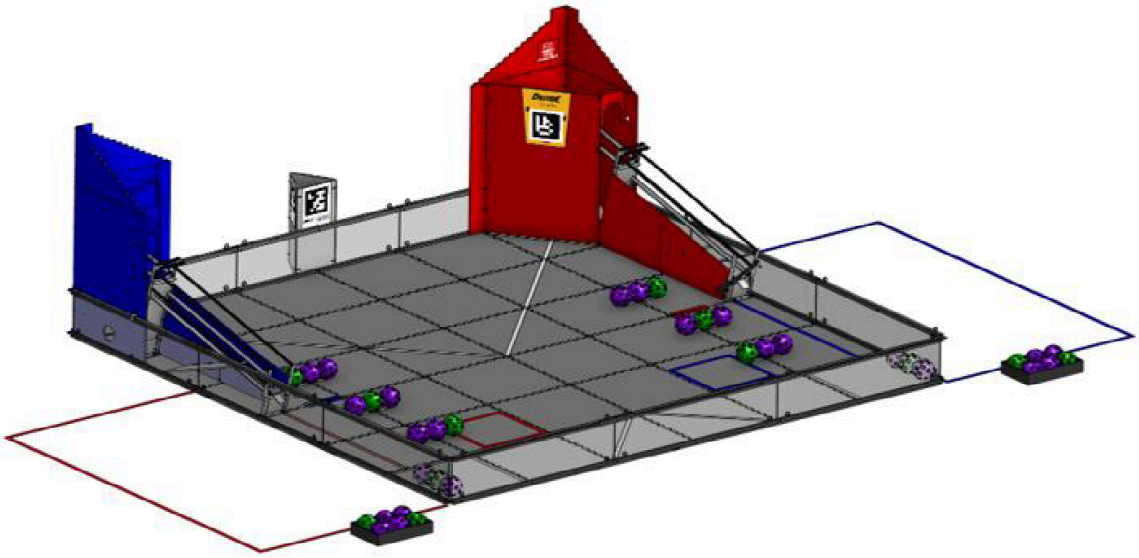
### Alliance Selection

After all the qualifying matches are held, the Alliance Section begins. Up to eight alliance captains are selected based on the tournament size. These captains then pick one team to be their alliance partner for the Playoff Matches.

### Playoff Matches

Alliances play in a double elimination style tournament which consists of an upper and lower bracket. Teams will face a new alliance each round until they have been defeated twice and are eliminated. The last alliance left standing is the event winner.

# Game Description



## The Game:

In DECODE™ presented by RTX 2 competing ALLIANCES of 2 teams each score purple and green ARTIFACTS in their GOAL, build PATTERNS, and race back to their BASE before time runs out.

Just before the match starts, the OBELISK is randomized to show one of 3 MOTIFS. The MOTIF for the MATCH defines what color PATTERN robots try to create on their RAMPS.

During the first 30 seconds of the MATCH, the ROBOTS operate autonomously. ROBOTS can use sensors to decode the randomized MATCH MOTIF. ROBOTS can earn points by scoring ARTIFACTS in their GOAL and building a PATTERN on their RAMP based on the MOTIF. ROBOTS also earn points for moving off the LAUNCH LINE.

During the remaining 2 minutes of the MATCH, human DRIVERS take control of their ROBOT. ROBOTS collect and continue to score ARTIFACTS in their GOAL to earn points. DRIVE TEAM members can retrieve ARTIFACTS from the ALLIANCE'S LOADING ZONE and help their ROBOTS by loading them with ARTIFACTS.

As time runs out, ALLIANCES can work together to return both of their ROBOTS to the BASE. ALLIANCES that build PATTERNS based on the MOTIF at the end of the MATCH earn additional points.

The ALLIANCE that earns the most points wins the MATCH and additional RANKING POINTS can be earned though completing other scoring achievements.

# Scoring

## Match Points

### Autonomous Period:

| Action | Points |
|---|---|
| LEAVE | 3 |
| ARTIFACT CLASSIFIED | 3 |
| ARTIFACT OVERFLOW | 1 |
| PATTERN: ARTIFACT matches MOTIF | 2 |

### Teleop Period:

| Action | Points |
|---|---|
| ARTIFACT CLASSIFIED | 3 |
| ARTIFACT OVERFLOW | 1 |
| ARTIFACT DEPOT | 1 |
| PATTERN: ARTIFACT matches MOTIF | 2 |
| BASE Partially returned to BASE | 5 |
| BASE Fully returned to BASE | 10 |
| BASE Additional Bonus: 2 ROBOTS fully returned to BASE | 10 |

## Ranking Points

| RP Type | Definition | Points |
|---|---|---|
| **MOVEMENT** | **Combined LEAVE + BASE points earned at or above threshold** | 1 |
| **GOAL** | **The number of ARTIFACTS scored through the SQUARE at or above threshold** | 1 |
| **PATTERN** | **PATTERN points earned at or above threshold** | 1 |
| **WIN** | Completing a MATCH with more MATCH points than your opponent | 3 |
| **TIE** | Completing a MATCH with the same MATCH points as your opponent | 1 |

# Participating Teams

**Note: This list is subject to final updates**

| Number | Team Name | City |
|---|---|---|
| **3397** | HiveMind Robotics | Essex Junction |
| **4946** | Robo Raiders | Montpelier |
| **5741** | RoboHawks | Hinesburg |
| **6731** | Ringers | Saint Albans |
| **7418** | Batteries Not Included | So Burlington |
| **8304** | Wired Cats | Saxtons River |
| **9622** | Maple Mechanics | Rutland |
| **9721** | Green Mountain Gears | South Burlington |
| **10899** | Mansfield Mechanics United | Jericho |
| **14251** | Capital Robotics | Montpelier |
| **16221** | Manchester Machine Makers | Bondville |
| **18351** | Robo Raiders III | East Montpelier |
| **18616** | River Valley RAD's FTC Team | Springfield |
| **18649** | Green Mtn Gearheads | Hyde Park |
| **18650** | Cookie Clickers | Bennington |
| **21577** | Bulldog Robotics | Burlington |
| **22683** | JV RedHawks | Hinesburg |
| **24107** | Trash Pandas | Westford |
| **24782** | Robo Raiders II | Montpelier |
| **25206** | Vikings | Lyndon Center |
| **26726** | Lamoille Robotics | Hyde Park |
| **28017** | Winooski Middle/High School | Winooski |
| **30656** | The Interns | South Burlington |
| **31126** | LCWS Gnomes | Shelburne |
| **31719** | Flying Tigers | Middlebury |
| **32473** | Bennington Bolts and Biscuits | Bennington |
| **32818** | Wired Cats Devo | Saxtons River |

# FIRST Alumni and Scholarships

Participants and alumni of *FIRST* programs gain access to education and career discovery opportunities, connections to exclusive scholarships and employers, and a place in the *FIRST* community for life.

Learn more about scholarships, internships, and alumni opportunities at **www.firstinspires.org/alumni**. If you're a graduating senior, make sure to register in our dashboard so we can stay in touch!

# *FIRST* Tech Challenge Awards

## INSPIRE AWARD

**The highest award that a team can be given.** The team that receives this award is a strong ambassador for *FIRST* programs and a role model *FIRST* team. This team is a top contender for many other judged awards and is a gracious competitor. The Inspire Award winner is an inspiration to other teams, acting with *Gracious Professionalism*® both on and off the playing field. This team shares their experiences, enthusiasm and knowledge with other teams, sponsors, their community, and the judges. Working as a unit, this team will have shown success in performing the task of designing and building a robot.

## THINK AWARD

**Removing engineering obstacles through creative thinking.** This award is given to the team that best reflects the journey the team took as they experienced the engineering design process during the build season. The engineering content within the portfolio is the key reference for judges to help identify the most deserving team.

## CONNECT AWARD

**Connecting the dots between community, *FIRST*, and the diversity of the engineering world.** This award is given to the team that connects with their local science, technology, engineering, and math (STEM) community. A true *FIRST* team is more than a sum of its parts and recognizes that engaging their local STEM community plays an essential part in their success. This team has a team plan and has identified steps to achieve their goals.

## MOTIVATE AWARD

**Sparking others to embrace the culture of *FIRST*!** This team embraces the culture of *FIRST* and shows what it means to be a team. This team makes a collective effort to make *FIRST* known throughout their school and community and sparks others to embrace *FIRST*'s culture.

# *FIRST* Tech Challenge Awards, Continued

## INNOVATE AWARD sponsored by RTX

**Bringing great ideas from concept to reality.** This award celebrates a team that thinks imaginatively and has the ingenuity, creativity, and inventiveness to make their designs come to life. This award is given to the team that has an innovative and creative robot design solution. Elements of this award include design, robustness, and creative thinking related to design. This award may address the design of the whole robot or of a mechanism attached to the robot and does not have to work all the time during matches to be considered for this award.

## CONTROL AWARD

The Control Award celebrates a team that uses sensors and software to increase the robot's functionality during gameplay. This award is given to the team that demonstrates innovative thinking and solutions to solve game challenges such as autonomous operation, improving mechanical systems with intelligent control, or using sensors to achieve better results. The solution(s) should work consistently during matches.

## DESIGN AWARD

The Design Award celebrates the team that demonstrates industrial design principles, striking a balance between form, function, and aesthetics. The design process used should result in a robot which is efficiently designed, and effectively addresses the game challenge.

## COMPASS AWARD (Optional Award)

**A beacon and leader in the journey of the team.** This judged award recognizes an adult Coach or Mentor who has provided outstanding guidance and support for a team throughout the year and demonstrates to the team what it means to be a *Gracious Professional*.

## Playoff Tournament Awards

The winning alliance and finalist alliance are both recognized for their achievement in robot game performance.

# *FIRST* Values

***Gracious Professionalism***® — Dr. Woodie Flowers, *FIRST* Distinguished Advisor and Pappalardo Professor Emeritus of Mechanical Engineering, Massachusetts Institute of Technology, coined the term *Gracious Professionalism.*

*Gracious Professionalism* is part of the ethos of *FIRST*. It's a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community.

With *Gracious Professionalism*, fierce competition and mutual gain are not separate notions. Gracious professionals learn and compete like crazy but treat one another with respect and kindness in the process. They avoid treating anyone like losers. No chest thumping tough talk, but no sticky-sweet platitudes either. Knowledge, competition, and empathy are comfortably blended.

In the long run, *Gracious Professionalism* is part of pursuing a meaningful life. One can add to society and enjoy the satisfaction of knowing one has acted with integrity and sensitivity.

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***Coopertition***® — *Coopertition* produces innovation. At *FIRST*, *Coopertition* is displaying unqualified kindness and respect in the face of fierce competition. *Coopertition* is founded on the concept and a philosophy that teams can and should help and cooperate with each other even as they compete.

*Coopertition* involves learning from teammates. It is teaching teammates. It is learning from mentors. And it is managing and being managed. *Coopertition* means competing always and assisting and enabling others when you can.

# *FIRST* Core Values

*FIRST* is committed to fostering, cultivating, and preserving a culture of equity, diversity, and inclusion that opens STEM opportunities for all. The *FIRST* community thrives under the set of *FIRST* Core Values:

# Thank You!

Thank you to all who help make this program possible for our students.

*FIRST* could not exist without our partners and the support of the many, many mentors, parents, teachers, and volunteers who step up to provide their time and expertise to inspire our young people to get excited about science, technology, engineering, and math.