

Chairman's Award - Team 5587

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2022 - Team 5587

Team Number

5587

Team Nickname

Titan Robotics

Team Location

Alexandria, Virginia - USA

Describe the impact of the *FIRST* program on team participants within the last 3 years. This can include but is not limited to percentages of those graduating high school, attending college, in STEM careers, and in *FIRST* programs as mentors/sponsors.

Titan Robotics prepares students for college and a future in STEM by teaching and developing technological, business, and workplace skills. As a result of team involvement, students find new scholarship and internship opportunities. 95% of graduated team members pursue a STEM field in college. Alumni have earned scholarships and have engaged in internships at top companies including SpaceX, Tesla, and Google. 16 alumni have returned to the team to contribute as mentors and FIRST volunteers.

Describe your community along with how your team addresses its unique opportunities and circumstances.

In the City of Alexandria, our community is very close-knit, with small local businesses being the main draw to the area. We have embraced these businesses into our team by creating in-depth partnerships with them. Because 61% of ACHS' population is eligible for reduced-price lunches, we've put priority into feeding our students at meetings; all made possible by the local small businesses around us.

Describe the team's methods, with emphasis on the past 3 years, for spreading the *FIRST* message in ways that are effective, scalable, sustainable, and creative. How does your team measure results?

Titan Robotics helps our local elementary and middle schools develop robotics teams and clubs. We have mentored 14 FIRST teams, including Future Titan Robotics, a middle school FTC team. FTC has fostered significant growth on our team. As FLL students age, we anticipate continued program growth. We established a pipeline of STEM clubs that continue through high school. Our team has worked 56 outreach events and hosted summer camps for 48 students.

Please provide specific examples of how your team members act as role models within the *FIRST* community with emphasis on the past 3 years.

Team members and alumni have volunteered at FIRST events and collaborated with other FRC teams in the area such as 5549, 614, and 5243. At an offseason competition, we took the initiative to form a scouting alliance when COVID restrictions prevented teams from bringing enough people. We are role models for younger FIRST teams. We hosted a scrimmage for a local FLL team to help them prepare by demonstrating competition expectations, gracious professionalism, and cooperation.

Describe your team's initiatives to Assist, Mentor, and/or Start other *FIRST* teams with emphasis on activities within the past 3 years.

Our team creates FIRST opportunities within the Alexandria community by establishing and mentoring 14 FTC and FLL teams. 70% of the students in our school district have access to one of the FIRST teams. We have raised \$7000+ to support local FLL and FTC teams and secured \$10000+ in additional grant funding. We also hosted the 2019 FTC Game Reveal, offered a practice field, shared our robot design strategies, hosted mock competitions, and provided grants to support our FTC teams.

Beyond starting teams, what initiatives have you done to help inspire young people to be science and technology leaders and innovators? What results have you seen from your efforts in the past 3 years?

In 2019, our team held 6 summer camps, introducing topics such as rocketry, physics, and Java to students. 4 camps became virtual in 2020. We produced videos on CAD, science, and DIY projects on YouTube. We also partnered with a local business, Building Momentum, to spend 178 hours manufacturing 350 desks for children without a home learning space. We also ran a Scout Jamboree for 17 students to earn robotics merit badges. As a result, we see increased interest and inquiry into our programs.

Describe the partnerships you've created with other organizations (teams, sponsors, educational institutions, philanthropic entities, etc.) and what you have accomplished together with emphasis on the past 3 years

From March 2020 to May 2021, our school workshop was closed. Building Momentum provided training and workspace during this time. This relationship continues with an employee mentor joining the team and our 501c3 board. We also partner with local restaurants that sponsor meals during the season. We worked with our school district to create 4 new FTC teams in Alexandria middle schools and 10 FLL teams in elementary schools.

Describe your team's efforts in the past 3 years to promote equity, diversity, and inclusion within your team, *FIRST*, and your communities.

We provide a welcoming environment to students pursuing STEM and business. Our flexible attendance, no-cuts, no-fees, and no prior experience policy allows all students to explore their interest in STEM. We provide food during meetings and competitions. This expands our recruitment and provides an accessible learning outlet. Our team surpasses industry standards on gender; 20 of our members and 55% of leadership are non-male, with gender balanced technical and nontechnical involvement.

Explain how you ensure your team and the initiatives you have created will continue to run effectively for the foreseeable future

Increased engagement in outreach events and FLL and FTC teams feeds our pipeline for future members. Our 501c3 board creates financial stability and maintains positive communication with school administration. Strong relationships with our school system support our summer camps. Our grants provide consistent, accessible funding for younger FIRST teams limited by school and parent budgets.

Describe your team's innovative strategies to recruit, retain, and engage your sponsors within the past 3 years

Our donation-based tier system gives back to our sponsors through team promotion, robot demonstrations and more. NAVSEA, Comcast, Boeing, Google, ACPS, Intuitive Surgical are consistent sponsors, as are a number of local businesses. We also have reliable restaurant sponsors. We maintain relationships through social media and attract new companies through student-created applications and sponsorship packets. We are continuously looking for improved methods of sponsor involvement.

Highlight one area in which your team needs to improve and describe the steps actively being taken to make those improvements.

Despite our school's 75% non-white population, 72% of team members identify as white. We hope to better mirror our community by reaching out to our international academy, a school-within-a-school for immigrant English learners. Our team excels in providing opportunities for non-male students, but we want to better reflect our school and students' experiences. Increasing student accessibility to FLL and FTC teams will encourage STEM engagement and improve our team's diversity.

Describe your team's goals to fulfill the mission of *FIRST* and the progress you have made towards those goals.

Our team's goals transcend building robots. We educate students in STEM and business skills. We revitalized FTC and FLL teams to make STEM more accessible. This helps younger students while building leadership skills in the FRC members themselves. Our team members have spent 78 hours since August 2021 assisting younger FIRST teams. This mentoring connects future members and begins a life-long investment in FIRST.

Briefly describe other matters of interest to the *FIRST* Judges, including items that may not fit into the above topics. The judges are interested in learning about aspects of your team that may be unique or particularly noteworthy.

Our team builds multifaceted leaders. Members are free to move between subteams, writing a grant one day and routing the next. Team members explore their interests in all aspects of robotics. Other traditions such as shop music, competition tutus, and team dinners help the team bond and feel like family. Our supportive environment embraces

student expression, where 56% of students identify as LGBTQ+. The tradition of democratically elected leads, giving all team members the opportunity to run.

Essay

Introduction

Team FRC 5587, also known as Titan Robotics, was established in 2015 and has provided opportunities for students in the City of Alexandria to learn about STEM ever since. As the largest public 9-12 high school in Virginia and the only public high school in Alexandria, Alexandria City High School has a large and diverse student body with students from over 145 different countries and ethnicities who speak 132 different languages. This diversity places us on the forefront of STEM outreach and exploration. We provide students with school-specific accessible opportunities not found elsewhere.

Titan Robotics prioritizes equity and diversity in our team, school, and the greater community. We have a policy of no cuts, no fees, and no skills required to participate. Students are always welcome on the team, regardless of their experience, abilities, or resources. Our in-school workshop creates an approachable way to join the team and learn about STEM, eliminating transportation barriers. We promote inclusivity on our team with majority non-male leadership and 56% of our team identifying as a member of the LGBTQ+ community. Our team teaches not only technical skills, but also builds life skills such as integrity, teamwork, leadership, communication, and time management. By having students work together to plan meetings and community events, we apply these skills in real-world scenarios.

Our Mission

Titan Robotics' mission is to conduct STEM outreach throughout our community and give students real world skills and experiences through a competitive student-led FIRST robotics team. We want to leave an enduring positive impact on our community through various methods. Our school is located in a diverse community with numerous economic statuses, ethnicities, cultures, religions, sexual orientations, and gender identities. Alexandria City High School has 4,148 students; 75% of them come from minority ethnic and cultural groups, and 61% of our students are eligible for free or reduced lunch. Titan Robotics prioritizes supporting students in more than just robotics. Our team provides meals and snacks at meetings, some of which are sponsored by local restaurant partners. We remain accessible to everyone in our community, as socioeconomically underrepresented students don't have to worry about costs and fees associated with many sports and activities.

In order to continue safe practices in our shop and give new members opportunities on our team, we conduct training lessons throughout the school year. We teach new and returning members about the shop, tools, equipment, and safety procedures through comprehensive demonstration and hands-on practices. This focus on competency ensures safe workplace habits and success during build season.

During the offseason, our team encourages underclassmen to lead robot design and build. We participate in events such as 449's Bunnybots competition and have freshman, sophomore, and other new students take control. Students gain real-world technical experience and leadership skills. This experience also provides a model for how build season and competitions will run.

Connecting with the Community

Titan Robotics works with our community to provide introductory STEM activities for students in Alexandria elementary and middle schools, participating in citywide events. When COVID-19 restrictions prevented access to our space, we reached out to another Alexandria makerspace, Building Momentum, echoing our beginnings at another local makerspace, Tech Shop. We competed with our robot built at Building Momentum in 2020 in an off-season competition CHSy Champs presented by FRC 1086. In the fall, we returned to the shop, welcoming students back to our own space and making meetings more accessible for new and existing team members. Although our membership had declined and there was a cohort of students missing hands-on technical skills, we recovered. We also reestablished relationships with generous restaurants in our community, who supply us with meals.

Helping our community, offering support to parents, teachers, local businesses, and school administrators is a priority. We are a resource for everything STEM in our community. One of Titan Robotics' goals is to enable more young people in the school district to embrace STEM. We do this in person, working 56 outreach events since 2019. We also shared our skills in accessible YouTube videos that share the basics of a wide range of STEM subjects. To reach more young minds, we offered virtual tutoring services to elementary school students in 2021.

One of our favorite places to spread FIRST is Art on the Avenue, an art festival in Del Ray, a walkable downtown neighborhood. This event attracts thousands of people and is the most visited annual event in Alexandria. In 2021, Titan Robotics distributed paper robot kits at this year's over-40,000-visitor event. Another way our team loves to reach out is mentoring FTC and FLL teams in Alexandria City Public Schools. We are dedicated to enabling success for teams and provide technical expertise and thousands of dollars in grant opportunities. By keeping an active role in our younger FIRST teams, we ensure that they mirror our accessibility and commitment to the community.

Our Team and its Growth

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Over the past three years, our team has faced various struggles with consistent, abundant membership. Recently, our team continues to invest significant work to grow by sharing our information across various media throughout the school. Despite the dropoff in membership in March 2020, our team has increased recurring membership as a result of our intensive marketing effort. Since the start of the 2022 build season, we have gained 17 new members compared to 3 new members we welcomed during build season in 2021. New members have contributed greatly to nontechnical work, rekindling a group that believes in the importance of outreach, fundraising, marketing, and other fields that previously had less attention on the team. This focus is crucial for all team members, as we now require 20 hours of nontechnical work for each student to have their travel and boarding fees for competitions paid by the team.

Our team offers an inclusive space for people of all races, sexual orientations, and gender identities. This support has fostered a team where 34% of students come from a non-white ethnic or racial background, 56% of students identify as part of the LGBTQ+ community, and 64% identify with genders that are not male.

Not only have we grown in membership, but we've also expanded our skills as a team. We have improved our robot design process, along with increasing our focus on the importance of non-technical tasks. This contributed to our qualifying for the Detroit FIRST World Championship in 2019 by winning the Engineering Inspiration Award at the FIRST Chesapeake District Championship. Despite Pandemic limitations, these improvements continued into the 2021-2022 season, with a first-place win at the Bunnybots competition hosted by FRC 449. Our recent success as a team isn't limited to competition; we also earned \$27,950 in grant money, made possible by our growing professional grant writing skills. These funds are part of our budget for our 2022 Rapid React robot. They also cover competition fees, helping us maintain a team that requires no member payment to go to team activities. Additionally, it funds outreach events, activities, and summer camps, serving to impact beyond the team.

Our Future in FIRST

As a team, we continue to support community members inside and outside of the STEM community in order to cultivate a generation of critical thinkers and innovators. We are working to revive and expand previously sponsored FLL and FTC teams that suffered in the pandemic. Without the ability to consistently meet in person, students on FLL and FTC teams lacked the necessary resources to continue operations. By revitalizing these teams we are providing accessible STEM opportunities to benefit the greater Alexandria community. Encouraging students to see STEM and robotics as an outlet for their creativity and ingenuity is a vision shared by both our team and FIRST itself. Our goal is to give students the tools and space to build real-world skills and experience that will aid them in becoming an active member of the community as well as pursuing a STEM related career in the future. As we take steps towards these goals, Titan Robotics continues to connect with diverse groups of people that STEM has not yet reached, allowing students to pave their own path to success.