



FIRST Tech Challenge Team 7842 Browncoats



2018-2019 Business Plan

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1.0 Introduction

1.1 *FIRST*® Description

FIRST (For Inspiration and Recognition of Science and Technology) is an international youth organization, founded in 1989 by Dean Kamen, to inspire young people's interest and participation in science and technology. The mission of *FIRST* is to encourage young people by engaging them in mentor-based programs which build science, engineering and technology skills that inspire innovation and that foster well-rounded life capabilities including self-confidence, communication, and leadership.

1.2 *FIRST* Tech Challenge Overview

The *FIRST* Tech Challenge (FTC) is a robotics competition that provides the opportunity for student teams to compete head to head using a competitive sports model. Guided by adult coaches and mentors, students develop STEM (Science, Technology, Engineering, and Math) skills and practice engineering principles while realizing the value of hard work, innovation, and sharing ideas. Teams also must raise funds, design and market their team brand, and do community outreach. Each season concludes with regional Championships and two exciting *FIRST* World Championships.



2.0 Executive Summary

2.1 Team Purpose

FTC Team 7842 Browncoats will support a team to compete within the *FIRST* Tech Challenge guidelines and in FTC sponsored competitions. Participants will learn engineering principles such as building, computer coding, technical and scientific writing, experimentation, marketing, fund raising, group and team work skills along with other STEM areas.

2.2 Team Motto

“We’ve done the impossible, and that makes us mighty.”

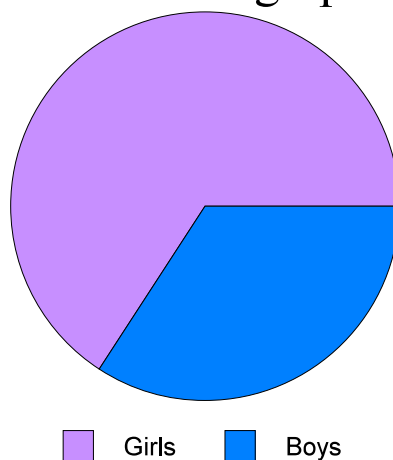
- Captain Malcolm Reynolds

2.3 Team Origin

The Browncoats are a community *FIRST* Tech Challenge robotics team from the Huntsville, Alabama area. Currently, the team is made up of six students - four girls and two boys - ranging from 8th to 12th grade. Between them, these students represent an area covering 250 square miles of North Alabama.

The Browncoats evolved from the *FIRST* Tech Challenge team, 12-Volt Ninjas, which was formed in 2011. In 2013, members from the *FIRST* Lego League team, Acronym, were brought in, and the team name was changed to Browncoats after a favorite science fiction television series, *Firefly*.

Team Demographic





653414735.54 m² | 653.41 km² | 161462.30 acres | 65341.47 hectares | 7033297699.66 feet² | 252.28 square miles | 190.26 square nautical miles
Current Perimeter: 109093.940m OR 357919.750feet

2.4 Team Name Origin

The Browncoats' name comes from our favorite science fiction series, *Firefly*. *Firefly* was an American space western series which originally aired in 2002. It was set in the year 2517 and follows the adventures of the renegade crew of *Serenity*, a "Firefly-class" spaceship. Although the show only lasted one season, fans worldwide call themselves Browncoats in allegiance to the Independents who waged a failed civil war against the Union of Allied Planets. The Browncoats' competition robot is named Vera after one of the *Serenity* crew member's favorite "tool".

2.5 Team History

We've gone from winning first place awards at qualifying competitions, to State Championships. 2016-2017 was our most successful season to date. We were selected as an alliance partner for the finals and won the Inspire Award at Alabama's inaugural State Championship. We competed with 71 other teams in the South Super Regional Championships in Athens, Georgia, and we were chosen as a final alliance partner and competed in the semi-finals, placing in 18th in our division and 14th overall. From there we were invited to attend the World Championship for the first time with 124 other teams. We ended the competition on a high note, finishing in the top half of the competition.

2017-2018 was a learning year for the Browncoats, with half of the team starting as rookies. Regardless of the challenges, the Alabama State Championship saw our team selected as an alliance partner in the final elimination matches, taking first place for the Motivate Award, second place for the Think Award, and third place for the Inspire Award. In addition, one of our team members, Ian, became a Dean's List finalist.

2.6 Team Organizational Structure

Our community team has mentors from many different fields, including a physicist who's worked with NASA, a mathematical professor, along with many technical engineers who coach the students on engineering principles, computer programming, and construction. Team members take on the responsibility of managing the team, deciding roles, and completing project tasks.



2.7 Team Relationships and Sponsors

2018-2019 Sponsors: AvaLAN Wireless, AUVSI Pathfinder, Huntsville Hamfest, Alabama Estate Planning Attorneys, SOLIDWORKS, Calhoun Community College, Midway Machine Shop, Doug Mach and Aurora Torres, Robert and Dorothy Jeffery, Thunderstorm Technology, and Aegis Technologies.



AvaLAN Wireless has graciously given us the space inside their offices that we need to keep our field set up and to meet and practice.



AUVSI Pathfinder has given us a grant for multiple years.



For the 4th year in a row, we have been asked to help in the Youth Lounge at Huntsville Hamfest's annual conference to help promote *FIRST* and our team.



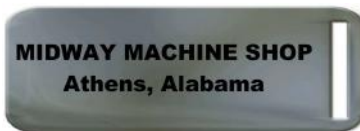
Alabama Estate Planning has helped us financially.



SOLIDWORKS has provided all of our team members with free student licenses.



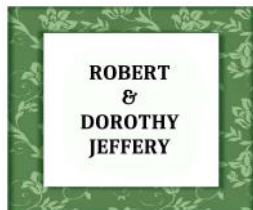
Calhoun Community College donated facilities for the first annual Rocket City FTC Invitational post-season competition.



Midway Machine Shop used their CNC machine to custom cut metal parts for our robot.



Doug Mach and Aurora Torres have helped us financially.



Mr. and Mrs. Jeffery have helped us financially, and they have volunteered to help us during many of our outreach events.



Thunderstorm Technology has donated four laptop computers to our team.



Aegis Technologies has helped us financially.

3.0 Sustainability

3.1 2018 Mission Statement

For the 2018/2019 season, the Browncoats will work to spread *FIRST* and *FIRST* Tech Challenge throughout Alabama by participating in community outreach, by reaching out to local schools, and by providing mentors to new teams.

For the Rover Ruckus game, our goal is to build a robot designed to perform every aspect of the challenge through team work and the application of engineering design principles. We plan to compete in local scrimmages, the Alabama State Championship, and hopefully to qualify for the World Championship with the overall goal of improving on our best ever standings.

3.2 Team Goals and Actions

ACTIONS	STRATEGY
Expand the <i>FIRST</i> Program	<ul style="list-style-type: none">• Start more FTC Teams in Alabama• Spread awareness of <i>FIRST</i> and STEM• Encourage schools to participate in FTC• Host informational meetings• Reach out to local schools and homeschool cover schools to introduce students and faculty to the <i>FIRST</i> program
Recruit new Team Members	<ul style="list-style-type: none">• Attend outreach related to <i>FIRST</i> and STEM• Reach out to local homeschool groups• Encourage friends and family to participate in <i>FIRST</i>
Expand social media	<ul style="list-style-type: none">• Connect with FTC teams• Post regular updates• Increase followers on Facebook, Twitter, Instagram, Website, and YouTube• Post about our journey, our progress, and events during the season
Develop and fully implement the team's design process	<ul style="list-style-type: none">• Apply engineering principles and mentor the team in a STEM-based curriculum• Expand CAD skills to support the process• Document design changes in Engineering Notebook
Create an award-worthy Engineering Notebook	<ul style="list-style-type: none">• Document each step of design process (explain each idea, problem, and solution using pictures, CAD models, and code)• Document team outreach in depth• Develop formatting that is easy to use and read
Retain team members through entire season	<ul style="list-style-type: none">• Maintain friendly and welcoming team atmosphere• Incorporate interactive and fun socials outside of robotics

ACTIONS	STRATEGY
Create a strong competition robot	<ul style="list-style-type: none"> • Partnership with Midway Machine • Design appropriate parts of the robot in CAD before assembling • 3D print parts

TEAM COMPETITION GOALS	COMPETITION STRATEGY
Win Alabama State Championship	<ul style="list-style-type: none"> • Create a strong robot that can complete the season’s challenges • Win the final alliance • Win the Inspire Award
Return to World Championship	<ul style="list-style-type: none"> • Win Inspire Award at Alabama State • Win final alliance at Alabama State • Double meeting hours • Place in top 15 in our division

3.3 SWOT Analysis

SWOT, which stands for Strengths, Weaknesses, Opportunities and Threats, is an analytical framework that can help an organization face its greatest challenges. We use this to determine our next steps as a team. We want to accept our weaknesses as a team and work with them to turn them into strengths.



FTC 7842 BROWNCOATS

STRENGTHS

WEAKNESSES

- Ability to improvise
- Problem solving
- Large meeting space
- Dedicated mentors and team members
- Out-of-the-box thinkers

- Limited Funding
- Time management
- Lack of school connection
- Limited practice time
- Few builders on the team

SWOT ANALYSIS

OPPORTUNITIES

THREATS

- Connections with other *FIRST* teams
- Outreach
- New team members willing to learn
- Connections with the local community
- Workshops to teach the new team members

- Few team members comfortable with public speaking
- Few writers
- Not enough teams in Alabama
- Limited Funding

3.4 Team Budget

Expense	Cost
Tools/parts for robot	\$1,700.00
Electronics	\$700.00
Arkansas Qualifiers and State Championship Registration	\$250.00
Tennessee State Championship Registration	\$200.00
Alabama State Championship Registration	\$250.00
World Championship Registration	\$2,000.00
Team Registration	\$275.00
Pit/field	\$1,200.00
T-shirts	\$150.00
Safety Goggles	\$40.00
Office Supplies	\$250.00
Travel/Lodging	\$5,000.00
Shipping/Posting	\$20.00
Food for Kick-Off, Scrimmages, and 2019 Rocket City FTC Invitational	\$500.00
Proposed Budget	\$12,535.00

4.0 Outreach, Recognition, and Strategy

4.1 Outreach

Connecting with the local community through outreach is important to the Browncoats. The scope of that outreach has recently been broadened to include area schools, churches, businesses, and more of the local engineering community. Over 800 hours of outreach have been accumulated so far this season at the following events:

- Community Informational and Recruiting Meetings held at local city libraries - 99 hours
- Volunteering at NASA's Rover Challenge - 25 hours
- U.S. Army Missile Defense Agency's Take Your Child to Work Day - 42 hours
- Hosted the 2018 Rocket City FTC Invitational post season competition - 148 hours
- Huntsville Library's Brickapalooza - 35 hours
- Hosted an FTC Robotics Programming Class - 36 hours
- Space & Missile Defense Symposium - 180 hours
- Huntsville SteamWorks *FIRST* Open House - 22 hours
- Volunteering at the Huntsville Hamfest Youth Lounge - 103 hours
- AUVSI Pathfinder Symposium - 87 hours

- 2018 Rocket City Nerdcon Discussion Panel Presentation, “Robots in Space - a *FIRST* Tech Challenge Overview” - 3 hours
- Volunteered at the *FIRST* Lego League Qualifier held at Columbia High School - 60 hours
- Demonstrated our robot and discussed *FIRST* Tech Challenge at the *FIRST* Lego League Qualifier held at Randolph School - 6 hours
- Hosted a Scrimmage for all area *FIRST* Tech Challenge Teams - 55 hours



2018 Rocket City FTC Invitational

4.2 Recognition

Winning Alliance Captain: Arkansas Qualifier, 2018-2019

Design Award: Arkansas Qualifier, 2018-2019

Motivate Award: Alabama State Championship, 2017-2018

Dean’s List Award Finalist: Alabama State Championship, 2017-2018

Inspire Award: Alabama State Championship, 2016-2017

Final Alliance: Alabama State Championship, 2016-2017

Think Award: Georgia State Championship, 2015-2016

Inspire Award: Georgia qualifier, 2015-2016

Final Alliance Captain: Georgia qualifier, 2015-2016

Think Award: Kentucky State Championship, 2015-2016

Winning Alliance: Alabama qualifier, 2014-2015

Rockwell Collins Innovate Award, 100 Scholars Qualifying Tournament, 2013-2014

1st Place Winning Alliance: Georgia Invitational, 2013-2014

1st Place Autonomous: Georgia Invitational, 2013-2014

5.0 Resources

5.1 Photos and Other Supplemental Materials

For more information about the Team and our outreach, please check out the following materials:

Team Engineering Notebook: <http://ftcbrowncoats.org/engineering-ntbk/>

5.2 Team Contact Information

Team Email address: FTCBrowncoats@gmail.com

Team website: <http://ftcbrowncoats.org/>

Team Facebook page: FTC7842Browncoats

Team Twitter: Ftcbc7842

Team YouTube: FTC Browncoats

Team Instagram: ftcbrowncoats

