

FIRST Tech Challenge (FTC)

2015-2016 Scale-Up Program

Overview: FIRST Tech Challenge (FTC) is a community-focused robotics program that teaches students the value of hard work, innovation, and creativity while going beyond the robotics competition by teaching teenagers the importance of working together, sharing ideas, and treating each other with respect and dignity.

Grade Levels: 7-12

Program Summary

FIRST Tech Challenge (FTC) is a mid-level robotics program designed to inspire and increase the interest of young people (ages 12-18) into STEM fields. FTC offers students the opportunity to: design, build and program robots, build experience and confidence with complex STEM-based concepts, document the engineering design process, develop problem-solving and team-building skills, enhance their public speaking skills, and compete and cooperate in alliances during tournaments. Additionally, FTC enables students, including those traditionally underrepresented in the STEM fields, to solve real-world challenges and offers a life-changing experience to help students realize a STEM career is feasible. Since 2008, The University of Iowa College of Engineering has served as the Affiliate Partner for the FTC program in Iowa. The FTC program in Iowa has received continual support from Rockwell Collins and John Deere.

Project Description/Objectives

- Increase the number of students who are engaged in a hands-on, team-based, STEM programming. FTC students have the opportunity to engage with STEM concepts, including: programming, physics, trigonometry, programming algorithms, calculus, etc. FTC is more than the robot—students also apply critical life skills: professionalism, effective communication, teamwork, etc.
- Increase the number of formal (schools) and informal groups (extension clubs, non-profit organizations, Boys/Girls Clubs etc.) who offer FTC to the students of their community.
- Increase the number of community partners involved with FTC. This includes the encouragement of local businesses to have employees serve as team mentors or as volunteers at local and regional events. Community partnerships increase team sustainability and allow businesses to give back to local labor force.
- Empower FTC teams to host local events. Regardless of where a team is located, by providing sufficient equipment and training, team will be able to host local competition events for teams in their area.
- Educate the FTC coaches and mentors through different Professional Development opportunities. Through education, coaches and mentors have a higher likelihood of program sustainability for several years.

What does the project provide?

FTC is for student teams of up to 15 students. The actual size of the team depends on the preferences of the coach. Through support from Rockwell Collins, new FTC teams will receive the FTC kit-of-parts and the licenses to the software platforms. The FTC kit-of parts is reusable for several seasons. Through the Scale-Up program, teams will receive equipment beyond the robot kit-of-parts. This equipment includes a laptop, reusable field equipment, consumable field equipment, extra robot parts, and required electrical components for hosting an event.

Two levels of professional development will be offered to FTC coaches, in which one PD is required for all coaches to attend. The FTC coaches and mentors will have access to periodic emails from the FTC-Iowa program and regular emails from the FIRST program. FTC students, mentors, and coaches will also have access to resources provided by FIRST, including a 24/7 competition and rule forum in which they can post questions and receive answers from the game designers. They will also have access to the local FTC website and the national FIRST website. Students who participate in FTC also qualify for college scholarships. These scholarship awards range from \$500 to full, four-year tuition.

What is required by the applicant in order to implement this program?

- A majority of the items will be **COST REIMBURSEABLE** to the applicant. There will be a list of vendors and items that will need to be purchased, and the applicant will need to submit receipts for reimbursement. **Reimbursement will take place in March or April.**
- **New FTC teams** will receive the following items directly: a laptop, a router, buttons, a binder with guides, a non-consumable field perimeter, consumable field elements, and a set of non-consumable tiles. New applicants will have approximately \$2,400 they will need to spend on pre-approved items and seek reimbursement. Receipts and other documentation will be required.
- **Returning FTC teams** will receive the following items directly: a binder with guides and a set of consumable field elements. They will have approximately \$530 to use for robot materials and other equipment from a pre-approved list of items. Receipts and other documentation will be required.
- No other materials—or bins—will be distributed during the PDs.

The Timeline for the applicant in order to implement this program:

- **August 2015:** Service provider will coordinate the logistics and finalize agreements with applicants.
- **September 2015:** A representative coach/mentor from each team must attend the Professional Development for either rookie teams (new to FTC) or returning teams (participated in the past.) Only two PDs will be hosted in Iowa.
- **September—October 2015:** The FTC Game is revealed and the build season begins. Teams establish regular meeting time.
- **November—December 2015:** Local tournament “meets” take place in each region. Teams compete in at least 3 meets.
- **January—March 2016:** Regional and statewide tournaments occur.
- **March/April 2016:** Applicant assessment and reimbursement.

Website to View Program and Standards Alignment: <https://www.engineering.uiowa.edu/ess/ftc-standards-alignment>

Program Video: <http://youtu.be/XULHBkAJUXs>