

**MOE, Miracles of Engineering**  
**FTC Team 365**  
**2014-2015 Business Plan**



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Updated as of 3/14/2015

## **1.0 Introduction**

### **1.1 MOE 365**

MOE 365 FTC is a FIRST Tech Challenge (FTC) team. We design, build, and program robots to play games released every year by FIRST (For the Inspiration and Recognition of Science and Technology). Our full team name is MOE – the Miracle Workerz. MOE stands for Miracles of Engineering. Our team has proudly advanced to the FTC World Championship three times in the past four years.

We take the FIRST core value of Gracious Professionalism very seriously. Gracious Professionalism is defined as part of the ethos of FIRST. Gracious professionals learn and compete together but still treat one another with respect and kindness in the process. We endeavor to exhibit it not only when working with other teams at competitions, but also to each other at meetings. Most importantly we use it outside of MOE events to people who know nothing of FIRST.

We have massive amounts of team spirit. Our spirit manifests itself in copious amounts of MOE green, MOE puns, and our famous MOE cheer. Our team's chemistry, gracious professionalism, and spirit are what drives us to be the best we can be and to excel in all we do.

### **1.2 Mission Statement**

The MOE FTC 365 mission is to proudly represent FIRST to our stakeholders in the community by:

- Acting with Gracious Professionalism in all that we do.
- Competing ferociously, but with utmost sportsmanship to our partners, competitors, and all event personnel.
- Spreading the core values of FIRST including Cooperation, Gracious Professionalism, and STEM based programs to our stakeholders.
- Building a team based on respect of individual members that acts as a cohesive unit.

## **2.0 Team Organization**

In order to properly organize the work we have to do, we have sub-teams with specific job descriptions. Team members design and build the robot, with the guidance of adult mentors.

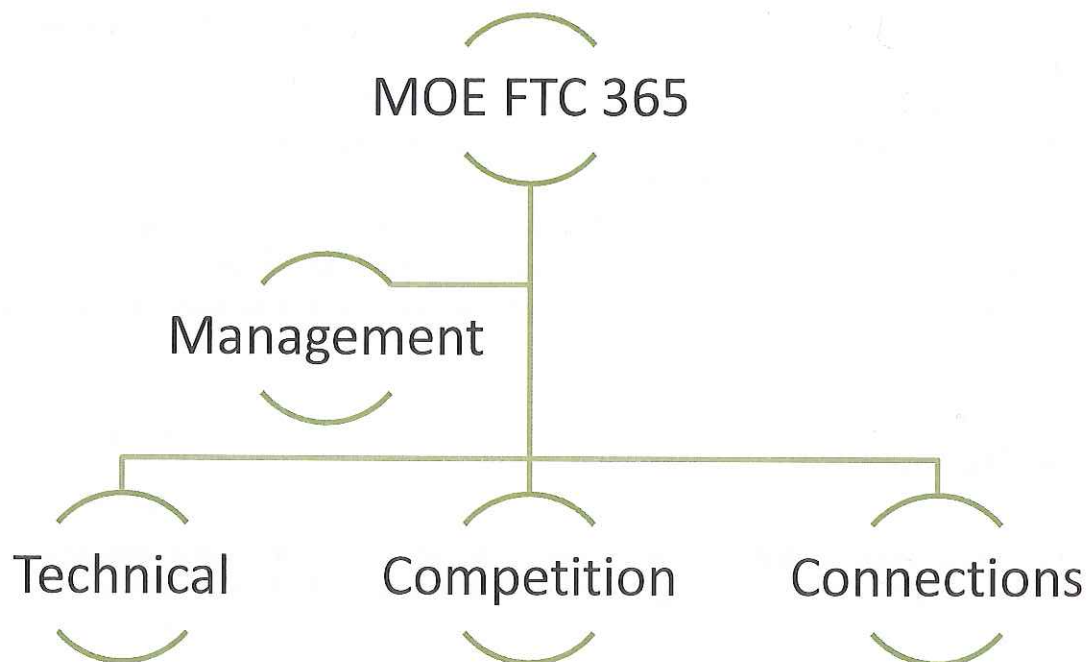
The Management team is an overarching sub-team that coordinates team activities such as meeting agendas, budget reviews, and team membership guidelines across our 3 main teams. These teams are the Technical team, Competition team, and Connections team.



The Technical team is responsible for building our competition robot. This team works on the robot design in CAD, programming and electrical, mechanical and build activities to construct a robot that can compete in the FTC competition. They also support team scoring strategies. Scoring strategies are achieved in brainstorming by the team and evolve during the season as we have time to adapt to key learnings.

The Competition team is responsible for organizing activities that support competitions and competition readiness. This includes having a process for choosing drive teams, each team member's roles at competition including scouting, team spirit, judging interview team preparation. It is important that team members understand their roles and other's roles.

The Connections team works on reaching out to the community via outreach, fundraising, and social media. This team promotes STEM based learning opportunities in schools and to other students. In addition, we reach out to local corporations to engage engineers to work with our team members to teach them industrial best practices. Another key activity of this team is to coordinate fund raising including corporate sponsorships and selling Horsey Youth Foundation chance. This team also looks for opportunities to give back to the community. We donate money to external charities to give back to the community. This includes donations to Edison Charter Chess team in Wilmington and ALS Ice Bucket Challenge. We plan on continuing this tradition going forward.



## **3.0 Team Goals**

In the beginning of the season, the team members define a set of team goals to help us through the season. There are general goals for the whole team and goals for each of the sub-teams as listed below:

### **3.1 General**

- Uphold FIRST's core values
- Uphold team's safety values
- Respect ourselves and others in all that we do.
- Share knowledge and help others
- Improve DE FTC teams and the program in general

### **3.2 Technical Team**

- Have a competition ready robot by November 1st
- Utilize CAD in the design process
- Experiment with different parts including COTS materials, sensors and 3D printed parts
- Have autonomous and physical robot components that address every scoring method by the end of the season
- Properly present the design process in notebook

### **3.3 Competition Team**

- Develop an achievable scouting approach
- Prepare a packing checklist
- Visual aid for the interview
- Have an initial draft for interview by October 18th
- Prepare a reasonable drive team process by October 8th

### **3.4 Connections Team**

- Maintain the event calendar on a timely basis
- Procure sponsorships from at least 3 or 4 businesses
- Organize at least 3 events to support local FTC teams in Delaware
- Stay up to date with social media; Facebook, Instagram, and Twitter (reach 1500 followers this season)
- Maintain a website that includes resources for other teams
- Reach out to the engineering community by sending letters asking for support
- Donate money to a program in the STEM community
- Participate in at least 17 outreach/fundraising events



## **4.0 Stakeholders & Sustainability**

MOE FTC recognizes that we have a responsibility to serve our major stakeholders including:

### **4.1 Stakeholders**

#### **4.1.1 Students and Youth**

MOE FTC is committed to helping spreading a passion for STEM based activities to our local schools and youth organizations. Some of our STEM based demonstrations, seminars and outreach events in the community include:

- DOW Science day at Wilmington Blue Rocks baseball stadium
- Chemistry Week at The Independence School in Newark, DE
- Newark, DE library events including hands-on robot demonstrations and discussions around robot building in FIRST.
- Participate in Delaware Museum of Natural Arts sessions
- Delaware State demonstrations of our competition robot at FLL qualifiers to show FLL students next step in FIRST progression to FTC.

#### **4.1.2 FIRST FTC program**

MOE FTC is committed to connecting with FTC teams by doing the following:

- We have had multiple sessions helping teams including: Bionic Builders, Wilmington Friends, Rhyme No Reason, Flaming Phoenixes to help develop their robots and team strategies.
- Organized and hosted Delaware brainstorming session that was attended by 5 teams and approximately 30 students.
- Conducted several classroom sessions at Duel on the Delaware including judging preparation hints, 3D printing overviews, and social media program guidelines.
- Organized and hosted Delaware based scrimmages including inspections, matches and judging advice for 10 Delaware teams.
- Conducted a Hair Spraying event at Eastern Super Regionals.
- Conducted 2<sup>nd</sup> Annual Button Pageant at World Championships.
- MOE FTC has over 1100 Twitter followers to reach the general public.
- Secured a new corporate sponsorship from Axalta Coating Systems awarded a Delaware FTC college scholarship to a deserving Delaware FTC senior. Axalta awarded this scholarship to Noah Andrews in 2014. This was the first Delaware FTC scholarship.

#### **4.1.3 Sponsors**

MOE FTC has attracted several new FIRST FTC sponsors this year through grants and fundraising. These sponsors include:



- Axalta Coating Systems



- Burris Logistics



- Be Barre Fit

In addition, we have sustained relationships with several existing sponsors including:



- Boeing



- Dupont



- Labware

#### 4.1.4 Mentors and Parents

MOE FTC is proud to have the support of mentors from various engineering and technical fields. Our mentors include:

- Ajay K. Prasad. - Engineering Alumni Distinguished Professor in the Department of Mechanical Engineering
- Andrew Szeto – Boeing – Lead Software Test Engineer
- Barry Price – Artesian Water – Engineer
- Ron Prettyman – Axalta Coating Systems– IT Architect
- Jim Morrill – Verizon – Technician
- Tim Chopko – Business Owner and Carpenter
- Jennifer Price – BioClinica - Director, Clinical Solutions at BioClinica, Inc

In addition to providing guidance and support to the students at MOE, Boeing and Verizon provide financial support through generous volunteer grants.

#### **4.1.5 MOE Students**

MOE FTC is committed to providing a fun outlet for our students to learn about robotics. Team members respect each other for their diverse skills and personalities. Our more senior members mentor newer students in understanding our core values. All students have a role that is valued and respected.

#### **4.2 Sustainability**

This is MOE FTC's eighth season. We are under the parent umbrella of First State Robotics as a non-profit organization. Our team raises all funds through direct sponsors, volunteer funds, team fund raising events and small team dues.

Our team is dedicated to building long term relationships with our sponsors by actively engaging them through the season. We have done employee demonstrations and events at Axalta, Boeing and Dupont. In addition, we ensure their logos are prominently displayed on our robot and team shirts.

We attract students from various schools and home school organizations. MOE FTC actively seeks new students before the season. The team usually has 2-3 new students every year to ensure a balance of experience that can be passed from more senior team members to new team members.

In addition, our team mentors are a mix of volunteers and parent volunteers. This allows us to ensure continuity from year to year.



## 5.0 Finances

MOE FTC's budget is managed through First State Robotics. However, the largest expense is not in the team budget. This is the travel budget for years that the team competes in FTC World Championships. We have competed in this event for 3 of the past 4 seasons. Our parents pay these expenses which are estimated at about \$16,000 for the season.

MOE FTC is very grateful that DuPont provides facilities and access to full workshop. This is a benefit that is invaluable.

## 5.1 Income

Actual Income is greater than original budgeted forecast, due to success in attracting new sponsors. In addition, MOE FTC, Rhyme Know Reason and MOE FRC from First State Robotics organized and hosted the first Delaware STEM Expo on March 7. This event was very successful. A total of 20 sponsors had exhibits on various STEM based initiatives in the state of Delaware. Approximately, 800 community members attended this event, which also hosted a FTC scrimmage with 8 area teams. In addition the movie Slingshot about Dean Kamen's efforts to purify water supplies in areas of limited access.

We plan on using this season's surplus in the following ways:

- Support a worthy STEM based activity in the Delaware community.
- We will designate a portion of any surplus to roll over to next year's budget to sustain the program.
- We are anticipating an additional \$1200 in expenses associated with switching to new control systems that will be reflected in next year's budget.

Income Sources	Income Budget Forecast July 1, 2014	Actual Income April 15, 2015
Corporate Sponsorships	\$2,500.00	\$5,375.00
Volunteer Matching	\$3,000.00	\$3,250.00
Lunch Fund Raising	\$400.00	\$150.00
Horsey Fundraiser	\$800.00	\$1,500.00
Bosco's Fundraiser	\$200.00	\$0.00
DE STEM Expo	\$0.00	\$772.00
Restaurant Fundraisers	\$ 200.00	\$0.00
Student Dues	\$1,000.00	\$1,000.00
Totals	\$7,900.00	\$12,047.00

## 5.2 Expenses

MOE's expenses are higher than original estimates for the following reasons. However, income is also higher than original forecast

- Build expenses are higher than original forecast.

- Registration expenses are in line with forecast.
- Invoices for team wear close to original estimates.
- If MOE qualifies for World Championships, robot and team supplies transportation cost will be around \$800.00 and team registration is \$1000.
- MOE will continue to make charitable contributions to worthy organizations that encourage students to learn STEM based organizations.

Expenses	Expense Budget Forecast July 1, 2014	Actual Expenses April 15, 2015
Activities/Outreach	\$500.00	\$1,074.00
Build Expenses	\$2,500.00	\$3,700.00
Competition Expenses	\$400.00	\$425.00
Team Wear	\$1,100.00	\$1,127
Event Registration Fees	\$2,600.00	\$2,975.00
Software Expenses	\$299.00	\$299.00
Charitable Donations		\$800.00
Totals	\$7,399.00	\$10,400.00

## 6.0 Resources

### 6.1 FIRST Links

- FIRST Website: <http://www.usfirst.org/>
- FIRST Tech Challenge Website: <http://www.usfirst.org/roboticsprograms/ftc>
- FTC in Delaware: <http://www.delawareftc.org/>

### 6.2 Team Links

- Team Website: <http://moefrc.org/>
- First State Robotics: <http://firststaterobotics.org/>
  - Social Media: Facebook: <https://www.facebook.com/MOEFTC?fref=ts>
  - Twitter: <https://twitter.com/MOE365FTC>
  - You Tube Channel: <http://www.youtube.com/user/moe365ftc>