

## FTC Bootcamp Class

Leah, Onyeka

### Outline of Information

- More than Just Robots
  - Intro to FIRST
    - Mission
      - The mission of *FIRST*® is to inspire young people to be science and technology leaders and innovators, by engaging them in exciting mentor-based programs that build science, engineering, and technology skills, that inspire innovation, and that foster well-rounded life capabilities including self-confidence, communication, and leadership.
    - *FIRST* Philosophies
      - Gracious Professionalism
        - It's a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community.
        - It is learning to compete but staying humble and treating the other teams with respect and kindness
      - Coopertition
        - *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* means competing always, but assisting and enabling others when you can.
  - Values
    - We express the *FIRST* philosophies of *Gracious Professionalism* and *Coopertition* through our Core Values:
      - **Discovery:** *We explore new skills and ideas.*
      - **Innovation:** *We use creativity and persistence to solve problems.*
      - **Impact:** *We apply what we learn to improve our world.*
      - **Inclusion:** *We respect each other and embrace our differences.*
      - **Teamwork:** *We are stronger when we work together.*
      - **Fun:** *We enjoy and celebrate what we do!*

- *FIRST* Tech Challenge
  - What is it?
    - Following a sports model, *FIRST* Tech Challenge teams design, build, program, and operate robots of their own design to play a floor game in an alliance format. Guided by adult coaches and mentors, students develop STEM skills and practice engineering principles, while realizing the value of hard work, innovation, and sharing ideas.
    - It's grades 7-12, ages 13-18
    - One step above *FIRST* Lego League (FLL), one below *FIRST* Robotics Competition (FRC).
  - General FTC Rules (whatever not covered can be added to presentation Raymond & Leah are doing)
    - 18 x 18 x 18 robot
    - Weight limit (42 pounds)
    - Uses Android phones to operate
    - Has an autonomous and teleop codes
    - Only *FIRST* approved parts allowed
    - Max amount of motors is 8
    - Max amount of servos is 12
    - Must have a flag holder
    - Team number should be visible from both sides
- Rover Ruckus
  - Overview
    - To attain a higher score than the opposing alliance by descending from the **Lander**, collecting **Minerals** from the **Crater**, sorting and scoring **Minerals** into the **Cargo Hold** of the **Lander**, performing **Autonomous** tasks, and navigating to specific parts of the **Playing Field**.
  - Autonomous Period [30 seconds]
    - Lowering from lander, claiming depots, parking in craters, identifying gold mineral in sampling field
    - **Landing** = 30 points
    - **Sampling** = 25 points
    - **Claiming** = 15 points
    - **Parking** = 10 points
  - Driver-Controlled Period (Teleop) [2 minutes]
    - Earn points by putting minerals into alliance's cargo hold and depot.

- **Gold Mineral in correct Cargo Hold** = 5 points/mineral
- **Silver mineral in correct Cargo Hold** = 5 points/mineral
- **Any Mineral in depot** = 2 points/mineral
- **Incorrect mineral in either cargo hold** = 0 points/mineral
- End Game [Last 30 seconds of teleop]
  - Latching onto the lander or parking completely or partially in any crater
  - **Robots latched** = 50 points/robot
  - **Robots parked partially in crater** = 15 points
  - **Robots parked completely in crater** = 25 points
- Engineering Notebook
  - What is it?
    - Think of the lab notebook you have to do for science fairs.
    - Logs the progress of the robot and what the team is doing
    - Includes information about the team and goals
    - Game strategy
  - How does one do it?
    - Not one, but the whole team!
    - Make engineering notebook a team endeavor
  - Awards that can be achieved with it
    - X

#### Class Lesson Plan-

- Class 1
  - Overview (1-5 priority)
    - Challenge (5)
      - Undecided
    - Robot presentation (3)
      - Tools
      - Materials
      - Rules/Guidelines
    - Relic Recovery (4) ?
      - Game video  
(<https://www.youtube.com/watch?v=7Wc1LhG2FEs> )
      - Game match video(s)
      - Manual  
([https://www.firstinspires.org/sites/default/files/uploads/resource\\_library/ftc/2017-2018/game-manual-part-1.pdf](https://www.firstinspires.org/sites/default/files/uploads/resource_library/ftc/2017-2018/game-manual-part-1.pdf) ,

<https://firstinspiresst01.blob.core.windows.net/ftc/game-manual-dw-part-2.pdf> )

- Team expectations (1)
- Quick Crash course on FIRST (2)
- Materials
  - Old FTC Robot
  - Access to a projector & laptop
  - Relic Recovery game manual (if we still have a printed version)
  - Engineering notebook
- Class 2
  - Overview
    - Rover Ruckus Tutorial  
(<https://www.firstinspires.org/resource-library/ftc/game-and-season-info> ) <https://www.youtube.com/watch?v=rR4gR4I2XA8>
    - Game Breakdown
      - Rules
      - Strategy
      - Point Breakdown
    - Engineering Notebook
      - Sample engineering notebook
    - Robot Ideas
    - Competition Guidelines (?) [business is supposed to teach event etiquette but talking about safety, drive team, and the teamwork aspect can be touched briefly as anything unsaid will be discussed by captains]
      - Safety
      - Teamwork
      - Awards
      - Drive Team
      - Expectations
  - Materials
    - Access to projector & laptop
    - Engineering notebook
    - Rover Ruckus game manual