

Mason Center for Robotics

Competition Programs

Drones in School | Battlebots | NRC



Mason Center for Robotics

501(c)(3) nonprofit organization with a mission across 3 pillars for students:

Competition Teams

- Robotics
- Engineering
- Coding
- STEM

Workforce Opportunities

- Job Shadowing
- College Programs
- Internships
- Education

Community Outreach

- Community services and education
- Company / NPO involvement
- Scholarships
- Hackathons | Engineering Events

All program costs cover facility, equipment, insurance, registration, shirts, etc.

Mason Center for Robotics

Volunteers

- We need volunteers to help keep the center growing
 - Help run teams with assistance from our mentors
 - Help coordinate fundraisers
 - Help grow our message to the community, schools, and universities
 - Help coordinate with local businesses for in-kind or monetary sponsorships



High School and Middle School Programs

- FLL-C (4th - 8th): Lego based : 1-2 spots open on teams
- FTC (7th - 12th): Java programmed robots : filled
- Racing Drones (7th - 12th): FPV drone racing : registration open
- BattleBots (7th - 12th): 1lb, 3lb Bots : registration open
- National Robotics Challenge (7th - 12th): various competitions : registration open for tryouts

Drones in School (Drone Racing)

Six Scoring Categories

Drones in School teams compete in six categories. These categories provide learning opportunities for a variety of student interests. Student teams can demonstrate mastery of various learning competencies through these competition areas.

1. Specification Judging
2. Portfolio & Team Display
3. Design & Engineering
4. Marketing Video
5. Head-to-Head Racing
6. Capture the Flag

Five Deliverables

Drones in School teams design and build/improve two racing drones, create a team display, portfolio, and marketing video. Teams earn points based on their race performance and how the judges score their display booth, engineering and technical skills, marketing video, and portfolio. These scores combine to award the overall race event champion. This structure provides an opportunity for any student to be involved in this program and find success.



Drones in School (Drone Racing)

A Focus on Project Management

Students learn project management fundamentals and use best practices to self regulate their team. Over the course of the season, students will develop valuable project management skills that are transferable to any career field.



Drones in School (Drone Racing)

- Curriculum

- Job Roles
- Early Flight
- Engineering the First Flight
- Introducing Project Management
- Logo and Team Branding
- Electricity, Circuits
- Antennas
- Flight safety
- Amateur Radio License
- Using the simulator
- Battery Safety
- Basics of Drone Flight
- Transmitter and Controller

- Curriculum

- Configuring Aircraft
- Flight Maneuverability
- Engineering
- Disassembling your Drone
- Frame Design
- Drone Tuning
- Race Setup and Scoring
- Video and Marketing

Drones in School (Drone Racing)

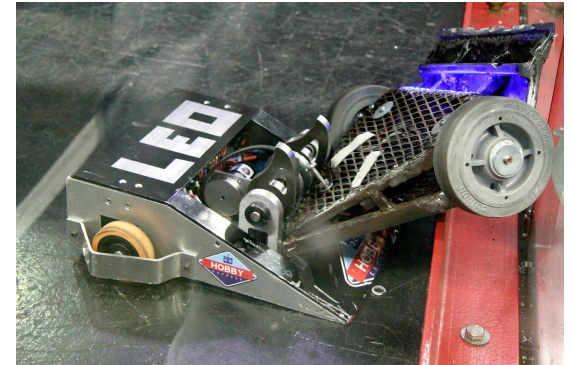
- Season Information

- Start week October 20 (possibly earlier to start planning)
- “End” May 21 & 22 National Championship Race
- Meet 2x per week
 - Monday 5:00, Friday or Saturday Morning
 - Wednesday 5:00, Friday or Saturday Morning
- Two teams (middle school & high school)
- Monthly simulator or virtual races (start October)
- Physical races (TBD)
- Cost: \$900 in \$150 monthly payments
- 4 student min, 7 student max



BattleBots (XtremeBots, NRC, and SkillsUSA)

- Overview: students design and build 1lb, 3lb bots that are remotely controlled and compete against other robots in a 2-3 minute match (match time varies upon competition)
- Students design a base and weapon and leverage COTS motors and controllers to construct their robot
- Students will learn CAD and have access to OnShape - The overall team will collaborate however sub teams will compete in 1-3 student groups
- Bots may be 3D printed, from kits, or fabricated



BattleBots (XtremeBots, NRC, and SkillsUSA)

- Season Information

- Start week October 20
- “End” first week of April or March 8th
 - Depends on class weight and progress
- Meet 2x per week
 - Subteams will choose their schedules
- Teams of 3-4 students per subteam, max of 16 students
- 1lb (3D Printed), 3lb Bots (high school only)
- Competitions
 - Ohio Bots League (October, January, February) - 1lb
 - SkillsUSA - 1lb
 - National Robotics Challenge (April 3, 4, 5) - 1lb, 3lb
 - XtremeBots (November, March 8th) - 1lb, 3lb
- Cost \$750: \$125 monthly - 1lb, 3lb

National Robotics Challenge (NRC)

- Overview: The National Robotics Challenge is designed to provide students of all ages and levels of study the opportunity to demonstrate their knowledge and understanding of manufacturing processes, controls, robotics, and other technologies through competitive engineering contests. Students are judged on their application of technology principles, engineering concepts, and their ability to solve real-world problems through a team approach.
- We will field teams from elementary, middle, and high school ages
 - Elementary will be invited from current FLL-C students
 - Middle and High School students will be based on application / selection

National Robotics Challenge (NRC)

- Programs Available

- Additive Manufacturing Challenge (7th - 12th) - \$
- Autonomous Vehicle Challenge (AVC) (7th - 12th) - \$\$\$
- Box Bot (Elementary) - \$\$
- Combat Robot (through Battlebots Teams) (7th - 12th) - \$\$
- Mini-Sumo Robot (7th - 12th) - \$
- Rescue Robot (7th - 12th) - \$\$\$
- Robo Hockey (7th - 12th) - \$\$\$
- Robot Maze (Elementary) - \$
- Sumo Robot (7th - 12th) - \$\$



BattleBots (XtremeBots, NRC, and SkillsUSA)

- Season Information

- Start week November 5th
- End April 5
- Meet 2x per week
- Team size vary depending on challenge
- Competitions
 - “Compete” with local schools and groups
 - National Robotics Challenge (April 3, 4, 5)
- Cost \$750-\$1200 (paid monthly)
 - Cost will vary depending on challenge(s) selected and total number of members on a team
 - Example: Robo Hockey or AVC require more cost