



# INTRODUCTION

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# 0 INTRODUCTION

## 0.1 WHAT IS THE *FIRST* ROBOTICS COMPETITION?

The *FIRST* Robotics Competition is an exciting program that assimilates teams, sponsors, colleges, and technical professionals with high school students to develop their solution to a prescribed engineering challenge in a competitive game environment. The program has resulted in life-changing, career-molding experiences for its participants. It is also a lot of fun.

In 2006, our reach will expand to over 28,000 students representing approximately 1100 teams. These teams will come from almost every state in the U.S., as well as from Brazil, Canada, U.K., Mexico, Ecuador, Ghana, and Israel. *FIRST* has truly become an international program and is continuously growing. These teams will participate in 33 Regional Competitions and can qualify for the Championship Event at The Georgia Dome in Atlanta, Georgia. The competitions combine the practical application of science and technology with the fun, intense energy, and excitement of a championship- sporting event.

This year's challenge will be presented at the 2006 *FIRST* Robotics Competition Kickoff on Saturday, January 7, 2006. At the Kickoff, all teams:

- Will be shown this year's game and field for the first time
- Will learn about the 2006 game rules and regulations
- Will receive a kit of parts. The Kit of Parts will include motors, sensors, chassis, transmissions, vision camera, bearings, and other materials that teams can use in the design and construction of their robots. They will also receive a multi-channel radio control system and a 12V battery power supply. The kit is meant to provide a level starting point for all teams. The rules also describe the additional items teams can purchase.

*When you bring dedicated, enthusiastic students, teachers, engineers, and other professionals together, they will produce a wide range of amazing machines that are competition ready in six weeks of construction time.*

## 0.2 GRACIOUS PROFESSIONALISM, A *FIRST* CREDO

Dr. Woodie Flowers, *FIRST* National Advisor, asks and provides his view regarding the question, "Why do *FIRST* folks talk so much about that phrase?"

Quoting Dr. Flowers, "Obviously it would not make sense to endorse "asinine professionalism" or "gracious incompetence." It is, however, completely consistent with the *FIRST* spirit to encourage doing high quality, well-informed work in a manner that leaves everyone feeling valued. Gracious professionalism seems to be a good descriptor for part of the ethos of *FIRST*. It is part of what makes *FIRST* different and wonderful.

"Gracious professionalism has purposefully been left somewhat undefined because it can and should mean different things to each of us. We can, however, outline some of its possible meanings. Gracious attitudes and behaviors are win-win. Gracious folks respect others and let that respect show in their actions. Professionals possess special knowledge and are trusted by society to use that knowledge responsibly. Thus, gracious professionals make a valued contribution in a manner pleasing to others and to themselves.

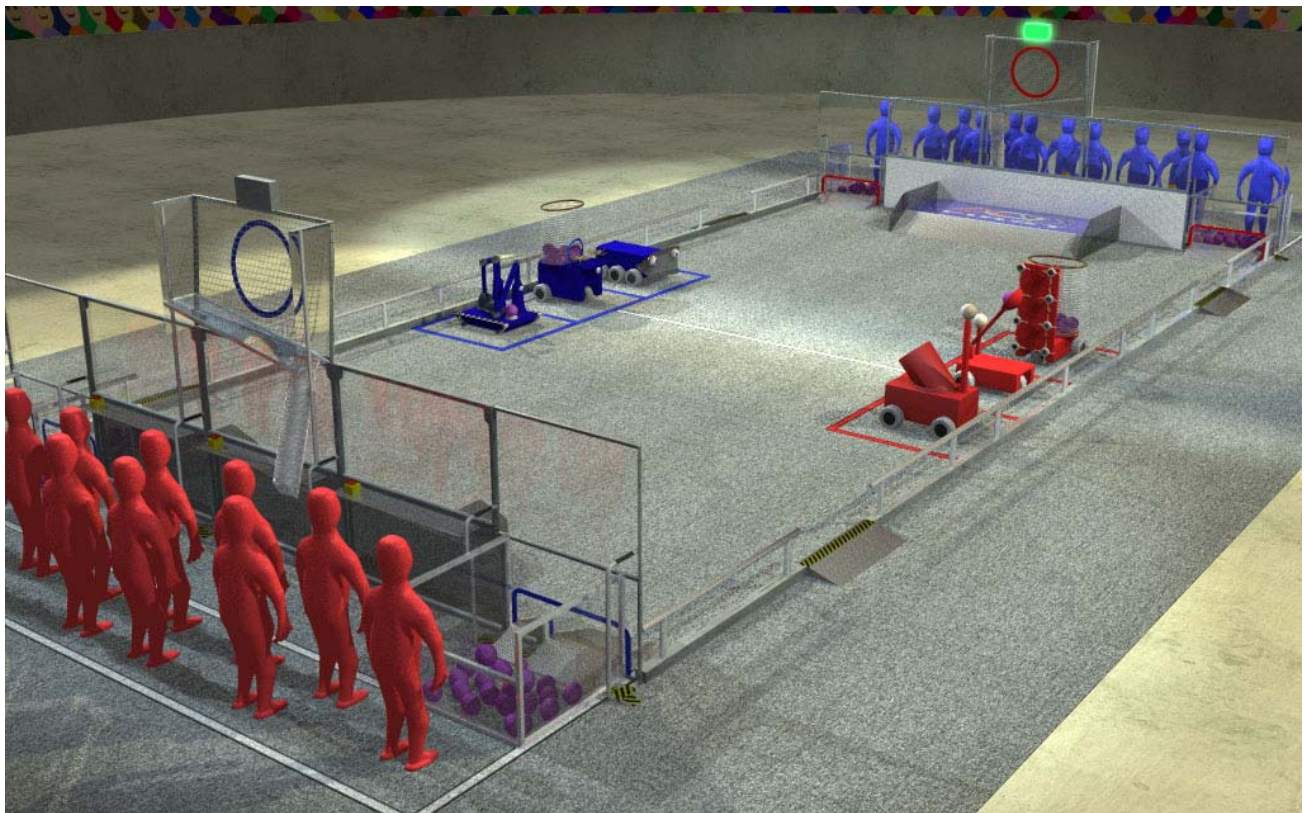
"In *FIRST*, one of the most straightforward interpretations of gracious professionalism is that we learn and compete like crazy, but treat one another with respect and kindness in the process. We try to avoid leaving anyone feeling like they are losers. No chest thumping barbarian tough talk, but no sticky sweet platitudes either. Knowledge, pride, and empathy comfortably blended.

"Understanding that gracious professionalism works is not rocket science. It is, however, missing in too many activities. At *FIRST*, it is alive and well. Please help us take care of it.

“In the long run, gracious professionalism is part of pursuing a meaningful life. If one becomes a professional, and uses knowledge in a gracious manner, everyone wins. One can add to society and enjoy the satisfaction of knowing that you have acted with integrity and sensitivity. That’s good stuff!”

### 0.3 SAFETY, A *FIRST* CULTURE

Safety is an important part of *FIRST* culture and should be observed by all participants at all times. As a part of the Industrial Safety Program, teams will be observed and evaluated at many different levels and by many individuals at the event. Safety Advisors will evaluate team safety behavior and practices in the Pit from the time the robot is uncrated, until the robot is re-crated for shipment. Referees will observe safety on the playing field as well as adherence to the rules. Judges will evaluate how a team has integrated safety into their robot designs when considering the team for technical awards.



## 0.4 THE 2006 GAME – “AIM HIGH”

“AIM HIGH” will present the teams with several new challenges:

- A 3 versus 3 alliance competition, with 3 vs 2 offense/defense periods
- A lighted target to improve vision system function (camera and associated electronics)
- Launching balls and pushing balls into goals..

This view (above) illustrates:

- Three Goals for each alliance
  - 1 Center Goal for each alliance
  - 2 Corner Goals for each alliance
- Alliance robots contained in alliance starting boxes.

3 **RED** human players and 3 **BLUE** human players stand in their alliance zones. Players must throw retrieved balls over the Plexiglas shields from behind the starting line to replenish alliance robot depleted balls, score single alliance points by manually throwing balls into corner goals, or throwing balls to disrupt opposing alliance ball launches.

Each alliance will have a maximum of 40 balls to start the game. Robots may contain up to a maximum of 10 balls at the start. Any balls not contained within the alliance robots will be provided to the alliance human players.

Robots will attempt to launch balls into the center goal for 3 points. Robots or human players may score a single point by throwing or pushing balls into the corner goals. Balls must stay in the goal and exit via the exit chute to count for a score. Human players may retrieve balls from the corner goals and / or center goal storage container. Human players can replenish any alliance robot and can share balls to maximize their scoring opportunities.

Each 2 minute, 10 second match, will feature two (2) three-team alliances playing from opposite ends of the field. The robots start from mid-field positions. Each match will consist of (4) periods: 1) period one autonomous mode (10 seconds), 2) a second (40 second) period, 3) a third (40 second) period, 4) and a final (40 second) period. After the autonomous period in which the robots control themselves, the robots are controlled by their drivers.

During the 10-second autonomous period at the start of a match, all robots can score points. The alliance with the highest score at the end of autonomous period will receive a 10 point bonus and be on “defense” in the next period. . During the second and third periods, one alliance is on offense and can score goals, and the other is on defense and cannot score goals. During these offense/defense periods, the defensive alliance must maintain a “BackBot”, which remains on its offensive side of the field either gathering balls, or setting up for shots, but not interfering with the offensive alliance.

In the third period, the scoring opportunity and the BackBot requirement switches. In the final period both alliances can score goals and/or play defense. Before the end of the match, alliance robots will speed back to their end zones and climb the ramp to the platform. Robots will score points for reaching their home platform before the end of the game: 5 points for one robot, 10 points for two robots and 25 points for 3 or more robots. Robots on an opposing alliances’ platform will be scored as points for their opponent.