

2016 - 2017 Team Handbook



www.robotcasserole.org

Sponsored by:
Caterpillar Inc.

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ROBOT CASSEROLE SPONSORSHIP

Robot Casserole is a Caterpillar Inc. FIRST Robotics multi-school team inclusive of all Peoria Area Schools and is physically located at Caterpillar Inc., Building A, Pioneer Park, 8201 N. University. Peoria, IL.

Active members of the 2016 Robot Casserole Robotics Team 1736 include:

- Caterpillar employees
- Small Business Owner
- Peoria Police Department
- ICC & Bradley University Students
- Richwoods High School
- Brimfield High School
- Peoria Area Home Schools

Caterpillar Inc. Provides

- Provides space for students and mentors to conduct FIRST related activities
- Engineer/Professional mentoring
- Vehicle (transportation to FIRST events)
- Program Leadership
- Materials and supplies
- Financial support

ROBOT CASSEROLE'S MISSION

As FIRST Team 1736 Robot Casserole, our mission is to inspire and foster students' natural curiosities and ingenuity on a technical challenge within real-life constraints that promotes the development of leadership, teamwork, problem-solving, technical, creative, software, and communication skills. We wish to be a prominent and visible force within our community that encourages gracious professionalism, cooperation, volunteerism, and hands-on STEM-based learning.

ROBOT CASSEROLE'S TEAM GOALS

- Inspire students to explore, experience, and appreciate technology, math, science, and engineering through hands-on participation in team activities
- Prepare students for leadership roles through shared decision making on the team
- Promote the ideals of FIRST in all that we do
- Increase community awareness of engineering education opportunities
- Promote teamwork skills
- Promote cooperation and volunteering
- Introduce students to positive role models
- Compete annually for the Chairman's Award (the highest award within FIRST)

TEAM CREDO

Robot Casserole Robotics Team

The function of this Team Credo is two-fold. First, it delineates the necessary personal character traits of all team members. Second, it identifies those things that are of great importance to Robot Casserole as a whole that will lead to a cohesive team and a successful season.

Robot Casserole team members will exhibit the following traits at all times:

Respectful

- of all students on our team.
- of the engineers, mentors, and teachers on our team.
- of the sponsors who graciously provide us with the resources we need.
- of yourself, both as an individual and as a member of this team.
- of the team as a whole and its image as a veteran member of the FIRST Robotics community.

Well Behaved

- by acting in a safe and appropriate manner at all times.
- by exhibiting a positive reflection of yourself, the team, FIRST, your school, and our sponsors.

Dedicated

- to learning as much as possible while a member of the team.
- to participation and being a fully engaged member throughout the season.
- to creativity in every aspect of your involvement with FIRST and the team.
- to team work by providing ideas and contributing time and energy to the success of the team.
- to having fun in all that we do as a team.

Enthusiastic

- by being motivated to excel on the team while encouraging others to be the best they can be.
- by being supportive of the team as a whole both at home and at competitions.
- by spreading the word about FIRST and all that it has to offer.

Inspired

- about science, technology, and engineering.
- about learning and sharing our knowledge with others.

I agree to abide by this team credo and will do my best to model those traits that embody the vision of FIRST and reflect positively on the team and its sponsors.

FIRST OVERVIEW

WHAT IS FIRST? FIRST (For Inspiration and Recognition of Science and Technology) is a non-profit organization that was founded to inspire and excite young people about science and technology by bringing together professional mentors with high school students from around the U.S. and several foreign countries.

THE ORGANIZATION: FIRST was founded in 1989 by inventor and visionary Dean Kamen. In the first year 28 teams participated in the only competition which was held in a high school gymnasium in New Hampshire. In 2016, there were 3,128 teams from 48 states and 24 countries (with over 3,000+ corporate and institutional sponsors) which compete in 56 regional events and the Championship event at the Edward Jones Dome in St. Louis. FIRST also sponsors Junior FIRST LEGO League, FIRST LEGO League and FIRST Tech Challenge competitions along with a series of education-related projects and programs. FIRST is a 501 (c)(3) organization headquartered in Manchester, New Hampshire.

THE VISION: Dean Kamen, founder of FIRST, imagines a day when the act of invention – that is, the work of scientists, engineers and technologists – is as revered in the popular culture as music, athletics and entertainment are today. The FIRST vision is to inspire in young people, their schools and communities, an appreciation of science and technology and an understanding that mastering these can enrich the lives of all.

HOW IT WORKS: Through a large, successful and growing community of educators, parents, community leaders, engineers, volunteers and sponsors, FIRST builds alliances to support its vision. A part of that vision is to inspire and prepare the future talent pool, workforce, and leaders to become capable, technologically literate citizens of tomorrow. FIRST designs accessible, innovative programs that build self-confidence, knowledge and life skills while motivating young people to pursue opportunities in science, technology and engineering.

FIRST ROBOTICS COMPETITION

THE GOAL: The FIRST Robotics Competition challenges teams of students and their mentors to design and build a robot in a six-week timeframe, using a standard “kit of parts”. The team has to analyze the game and strategize what type of robot would perform well. Typical teams meet months in advance of the building period to learn basic skills and be better prepared. The goal isn't simply to build a robot; the robot is a vehicle for learning much more. The real goal is building a collaborative team, a supportive community and a solid strategy for problem solving during the competition.

TEAMS: The average team competing is comprised of about 25 students and 6-12 adult mentors; however, entire schools, school districts and communities are involved with FIRST. Typically a corporate sponsor assists in funding the team. In the case of Robot Casserole, that corporate sponsor is Caterpillar Inc. Product Development & Global Technology Division.

WINNING: FIRST redefines winning. Winning comes through excellence in design, demonstrated team spirit, gracious professionalism, and the ability/maturity to overcome obstacles. Winning comes through the building of partnerships with other students and professionals, and between schools, businesses, and communities.

FIRST 2017 The 2017 FIRST Robotics Competition season begins with the release of the kits and game rules on Saturday, January 7, 2017, and will involve over **3,000+ teams** from every state across the U.S., as well as 20+ other countries. The teams and competition bring together students of different levels of achievement, different racial and social backgrounds, boys and girls, from inner cities across America as well as from rural communities. Joining the high schools and colleges/universities participating on teams will be over 3,000 sponsors representing some of the most well-known and highly regarded companies in the world.

THE EVENTS: There are 53 regional and 65 district competitions scheduled to take place in February through March, across the U.S., Canada, and Israel. In addition, a Championship Event will be held in St. Louis, Mo, in April 2017. The Championship event draws participants from across the country and around the world and includes the competition itself, a FIRST Hall of Fame that spotlights model teams, and a conference that provides educational seminars for both students and mentors. Teams, fans and spectators will number well over 30,000 for this single 3-day event.

FIRST: POSITIVE IMPACT AND MEASURABLE DIFFERENCE

FEEDBACK: Studies undertaken by several universities as well as thousands of stories support the positive impact of FIRST. The results of hard work and serious play include lives changed forever and minds opened to new knowledge and opportunities through participation in FIRST programs. The evaluation work is producing important data about the impact of the FIRST program on high school students, including:

- **ATTITUDE:** Improvement in student attitudes about science, math, teamwork and the working world.
- **SELF-IMAGE:** Improvement in students' self-image, particularly among underrepresented groups.
- **TEAMWORK:** Highly positive attitudes about teamwork, including increased respect and support students accord one another.
- **SELF-CONFIDENCE:** Student self-confidence improves after their FIRST experience.
- **CAREER PLANNING:** Student attitudes about the working world are significantly more positive.
- **PROFESSIONAL RELATIONSHIPS:** Two-thirds of student participants indicate interest in working for one of their team sponsors and one fifth actually had plans to work for one of their team sponsors in a summer internship or a part-time job.

HIGHER EDUCATION: In 2016, **\$25 million in college scholarships** were available to students participating in FIRST. In many cases, whether or not scholarship is the key, FIRST provides students with the inspiration and confidence they need to consider college and to pursue educational and professional opportunity. Several of our graduated students have taken advantage of the FIRST scholarships and are currently enrolled in engineering/science/technology curriculums in college.

ROBOT CASSEROLE 2016 SEASON



Team competed in 2016 game “Stronghold”, a game at the Central Illinois Regional in Peoria, IL and Midwest Regional in Chicago, IL. We were the Finalist & awarded the Imagery Award at the Central Illinois Regional & the Regional Winners at the Midwest Regional. The Team competed at the FIRST World Championship in St. Louis and was awarded the Imagery Award for the Hopper Division.

History of Team Award:

2006 – Chicago Regional
 2007 – Wisconsin Regional
 2008 – Wisconsin Regional
 2009 – Wisconsin Regional
 2010 – Wisconsin Regional
 2011 – Wisconsin Regional
 2012 – Wisconsin Regional
 2013 – Boilermaker Regional

2014 – Central Illinois Regional
 Wisconsin Regional
 2015 – Midwest Regional
 2016 – Central Illinois Regional
 Midwest Regional
 World Championship

Xerox Creativity Award
 GM Industrial Design Award, Semi-Finalist
 Judges Award
 Chrysler Team Spirit Award
 Chrysler Team Spirit Award
 Chrysler Team Spirit Award
 Imagery Award
 Chrysler Team Spirit Award & UL Industrial
 Safety Award
 Chrysler Team Spirit Award
 Chrysler Team Spirit Award
 Chrysler Team Spirit Award
 Finalist & Imagery Award
 Winner
 Imagery Award (Hopper Division)

FALL, 2016 ACTIVITIES

Preseason: 09/20/16 thru 12/8/16

- Meeting at Caterpillar Inc, Building A, Pioneer Park, 8201 N. University, Peoria, IL
- Tuesday & Thursday 6 to 8 PM
- Additional days and times as needed – TBD

➤ **Practical Skills Development**

During fall we will focus on training and learning skills through hands-on activities so you are prepared for the competition season. Follow are some of the areas of focus:

- Safety
- Mechanical & Fabrication
- Computer Aided 3D Design/Modeling
- Programming
- Pneumatic & Electric wiring/circuits Design
- Media Photography and Video
- Web Site design/programming
- Team building & Leadership

We will also engage in some community events and robot demonstrations to spread the word of FIRST. Students will be required to participate in these events.

WINTER/SPRING 2017 SCHEDULE

Spring semester is the busiest time for Robot Casserole Robotics Team. With the build season kicking off in early January and competition events taking place throughout the following months, it is important that the momentum continues.

During the build season: 1-7-17 thru 2-21-17

- **Kick off (1/7/17) – Bradley University, Renaissance Coliseum @ 8:30 AM to 10:45 AM, lunch break, then move to Jobst Hall or Caterpillar Inc., Pioneer Park 12:00 PM to 3:00 PM**
- **Build Week 1 – 6:**
 - **Meeting at Caterpillar Inc., Bldg A, Pioneer Park, 8201 N. University, Peoria, IL**
 - **Monday through Thursday 6 to 9 PM**
 - **Saturday 8 AM to 2 PM**
 - Additional days and times may be needed
(e.g. Jan 16th MLK Day & Feb 20th Presidents Day) – TBD
 - The team will not meet on any days when there is bad weather
- Build Week 1: Game strategy, robot design concept & prototyping
- Build Week 2: Concept selection and detail design creation
- Build Week 3: Fabrication of components & sub-systems, programming
- Build Week 4: Robot assembly and sub-system integration
- Build Week 5: Robot testing and validation
- Build Week 6: Driver training and robot fine-tuning.
- **Stop Build (2/21/17) 6:00 PM**

Post-Build Season: 2/23/17 to night before the competition:

Design modifications, gathering and building spare parts, preparing the pit structure, travel and competition planning, driver and pit crew training.

- **Post-Build team meetings** at Caterpillar Bldg A, Pioneer Park
- Before first regional competition: Monday thru Thursday 6 to 8 PM & Saturday
- Between first & second regional competition: Tuesday and Thursday 6 to 8 PM
- Additional days and times may be needed – TBD

Central Illinois Regional: 3/17/17 to 3/19/17

- Competition will take place in Bradley University, Renaissance Coliseum.
<http://www.ilfirst.org/frc/events/central-illinois-regional/>
- Students will be responsible for travel arrangements to and from the venue. Detailed time schedule will be provided at a later date.
- Parents, siblings and friends are welcome. Admission is free.

Midwest Regional: 3/29/17 to 4/1/17

- Competition will take place in Chicago IL, at the Univ. of Illinois Chicago Pavilion
- Details about departure, arrival, and other travel details – TBD
<http://www.ilfirst.org/frc/events/midwest-regional.html>

Championships: 4/27/17 to 4/29/17

- Competition will take place in St. Louis, Missouri at the Edward Jones Dome.
- Participation is dependent on success at the regional competition
- Details about departure, arrival, and other travel details - TBD

TEAM REQUIREMENTS & OPPORTUNITIES

Students are required to be passing in their studies to join the team. Students must meet & maintain their school and parental academic requirements. **Students will be required to have a signed excused absence eligibility form from their school counselor to travel with the team.**

ASSISTANCE

In order to help the students meet this requirement, study time and peer/mentor tutoring will be available for students who are in need of assistance during practice time. If students need to miss a meeting to study for a test or improve their grades, that is understood.

OPPORTUNITIES

There are many **REWARDS** for being a committed Robot Casserole team member:

1. Travel Opportunities
 - At a minimum the team will be traveling to one regional event which could be as close as Chicago or further away as Milwaukee (last 4 years). In 2017 we will be traveling to Chicago, IL for the second competition.
 - Potentially the team will travel to St. Louis, MO for the championships
2. Scholarships
 - There are MANY scholarships available for FIRST team members. Check out <http://www.firstinspires.org/scholarships> for details.
 - Last year > \$25 million in scholarships were available to FIRST students only.
3. Internships
 - The experience students are exposed to opens doors for internships within Caterpillar and other high-tech companies. See your guidance counselor and www.cat.com and select the "Careers" tab.
4. Experience
 - Many corporations across the nation are participating in FIRST and want to hire FIRST students. Being on a FIRST team will expose students to these corporations, provide them with opportunities to meet some of the mentors who work for these corporations, and help teach the students skills that these companies desire.
 - Additionally some colleges (Purdue, University of Illinois, etc.) offer college credit to engineering students who help mentor FIRST teams.

TEAMS WITHIN THE TEAM (STUDENTS AND MENTORS)

SAFETY

Safety in all we do, first priority
Train team about safety during the season and at the events
Assist with hands-on training for tools & power tool operation
Establish procedures for reporting an accident or safety violation

ADMINISTRATION

Develop a team budget and approve expenditures
Coordinate event logistics including transportation and lodging
Team and robot documentation
Shipping

COMMUNICATION

Coordinate community relations events and develop PR materials
Document team activities through photos and video
Create and update team web site

COMPETITION AWARDS

Create Chairman's Award submission
Assist with Team Identity and Imagery
Assist with the student scholarship applications
Design and develop peer Awards

COMPETITION MANAGEMENT

- Design, develop and organize the competition pit
- Develop and implement scouting software and hardware
- Develop game strategy and team playbook
- Design, create team promotional items, banners & signs

SOFTWARE, CONTROLS & ELECTRICAL

Develop software for robot automated & tele-operated control and human interface
Design and develop electrical systems for robot and controllers
Design and develop pneumatic systems for robot
Assist in troubleshooting of robot operation and controls

MECHANICAL

Develop design solutions based on game strategy
Convert sketches to solid models to assembly models to working drawings
Fabricate parts
Assist in the assembly and troubleshooting of robot
Create parts list and pricing

REQUIRED STUDENT INVOLVEMENT

Robot Casserole students have many ways to be involved with the team. They are encouraged to participate in community events, and during the fall they participate in the team events, training, and meetings. During the build season, January 9 – February 23, students are required to become full-time active and engaged members of the team and participate in the robot building and related activities.

In order to travel with the team, students are not only required to meet the academic requirements, but they also must be active members as defined below.

Active Member Status:

- **The primary factor determining whether a student is eligible to travel with the team to the regional and championship event will be ACTIVE PARTICIPATION.** Just physically being at the meetings is not enough, students must contribute their ideas and energy to the team. If students don't know what to do, they can ask any mentor for help. Team leadership will have the final say as to who is eligible to travel, students who are not actively participating will be notified by the leadership, and if the behavior continues, will be removed from the team.
- **Students are expected to be present at and participate in team meetings during the build season, be engaged and fulfill their commitment on the team unless they agree to another schedule with the team mentor. Student attendance will be tracked** to ensure students are accountable for their commitment to the team. Please notify the team lead or your sub-team mentor and record the absence in the attendance database at a team meeting. Students are responsible for signing into the attendance database every meeting and recording absences.
- **Students are expected to spread the word of *FIRST* through participating in STEM & Community outreach events.**
- **Cell Phone Usage:** Cell phones may be brought to the meetings, but must remain in the students pocket, backpack or purse unless an emergency call is required. **Students will not text, call, take pictures, share videos or music during team activities.** Additionally, **only approved members of the media team are allowed to capture or distribute any images or descriptions of team activities per the data privacy policy.** Cell phone breaks will be scheduled during the meetings to allow students to use the phones. When breaks are over, phones go back in the packs, purses, pockets. 6 weeks is not enough time to design and build a robot, but it is all we have, so we must make effective use of meeting time. **Texting is not considered active participation on the team.**

In Summary:

Student priorities should be family, school, FIRST, in that order.

Students are expected to fulfill their commitment and obligation on the team, but if you have higher priority obligations or extenuating circumstances, please communicate with the team lead or sub team lead to excuse your absence.

PARENT/MENTOR INVOLVEMENT

Parents and adult mentors are strongly encouraged to help out in any way they can. This is a very important time in your child's life as they start searching for a future college major/career and you can be a big part of that decision by participating on the team. The efforts of these mentors must be student-focused and within the spirit of FIRST. There are many opportunities to mentor our team's students such as:

- Mechanical Machine Design
- Software Development & Programming
- Metalworking & Part Fabrication
- Project Coordination
- Video & Graphic Publications
- Machine Shop Management
- Travel Coordination
- Electrical Design & Wiring
- CAD – Design, Drafting, Animation
- Carpentry & Construction
- Communication & Public Relations
- Event Planning
- Strategy Development & Coaching
- Scholarship coaching and submission

COMMUNITY INVOLVEMENT

Robot Casserole keeps active in the local community, as they host and participate in events, make demonstrations and support other math and science-related programs for the area's students. Examples of these events and activities include:

FIRST LEGO League mentoring (Aug.- Dec)
 FIRST LEGO League Regional Tournament (Dec)
 FIRST Tech Challenge Regional Tournament (Dec)
 4-H Clover Clinic @ ICC (Mar)
 Library Lego Robotics (Apr – May)
 Introduce a Girl to Engineering Day (Oct-Nov)
 NSBE Fresh Start Workshop (Oct)
 Robo Mania @ Peoria Public Library (Jun)
 Robo Rumble @ Riverfront museum (Jun)

For more information about Robot Casserole and demonstrations, please contact Asit Patel at 309-675-9171 (patel_asit_r@cat.com).

REGISTRATION AND FORM REQUIREMENTS

Robot Casserole Application Form
 Caterpillar Release, Waiver of Liability, and Indemnity Agreement
 Student Travel Rules & Expectations
 STIMS registration <<https://my.usfirst.org/stims/Login.aspx>>

PRIVILEGES, RESPONSIBILITIES, CHOICES AND CONSEQUENCES

Robot Casserole FIRST Robotics Team

The Robot Casserole Robotics Team Handbook identifies and explains a wide variety of activities and events that the team engages in. It also lays the foundation for the level of commitment and conduct that is expected of a member of the Team. It is up to the student to read this handbook and understand their privileges, responsibilities, choices, and consequences.

Participation in the Robot Casserole Robotics Team is a privilege, not a right. As such, there are certain responsibilities that fall on the shoulders of the student. This is an opportunity for students to demonstrate a desire for learning, leadership, cooperation, peer mentorship, and teamwork. It is also a time when students need to be responsible for their actions on both an academic level and an interpersonal level.

Students who choose to abide by the guidelines established in this handbook will experience the pride and camaraderie of being involved in a robotics team. Those who choose to ignore their responsibilities as a member of this team will be advised according to the steps that follow.

Robot Casserole (RC) Disciplinary Procedure

- Step 1 The student will be advised by a mentor as to the unacceptable actions and asked to make appropriate changes to remedy the situation. If changes are not made, proceed to the next step.

- Step 2 The student's parents will be contacted and a meeting will be scheduled with the parents, student, and appropriate mentors/administrators to discuss the situation. The student may not return to the team or participate in team activities until the meeting has taken place.

- Step 3 The student will be suspended from the team for the next 2 team functions/events or a period of 2 weeks, whichever is longer. During this time they may not participate in team meetings, team competitions, or any other activities the RC engages in.

- Step 4 The student will be removed from the team.

Addendum: If offenses are gross enough in nature, some steps maybe skipped to the point of immediate expulsion from the team.

FACILITY: Students are required to stay within the allocated area while at a Caterpillar facility. They are not allowed to explore, go into other areas, or touch any equipment. Students who do not comply will be asked to leave the team.

ROBOT CASSEROLE TEAM CONTACTS AND INFORMATION

Robot Casserole Website: <http://www.robotcasserole.org/>

2016-2017 Leadership Team

Asit Patel	Work Phone	309-675-9171
Team Leader	Email	patel_asit_@cat.com
Robot Casserole	Email	frc1736@gmail.com
	YouTube	https://www.youtube.com/user/FRC1736
	Facebook	https://www.facebook.com/FRCteam1736
	Twitter	https://twitter.com/FRC1736
	Pinterest	https://www.pinterest.com/frc1736business/

FIRST	Website:	http://www.firstinspires.org
	Phone #:	800-871-8326 or 603-666-3906
	Regional Director	Susan Lawrence
		sklsumgrad@comcast.net

Discussion Forum: <http://www.chiefdelphi.com/> (make sure to register)

Michelle Unser	Work Phone	309-675-8369
Caterpillar Coord.	Email	Unser_Michelle_M@cat.com

Resources:

- www.andymark.com
- www.vexrobotics.com
- www.digikey.com
- www.smallparts.com
- www.industrialprofile.com
- www.mcmaster.com
- www.grainger.com
- www.torrington.com
- www.bimba.com
- www.bostongear.com
- www.innovationfirst.com
- www.banebots.com
- www.onlinemetals.com
- www.gates.com

STUDENT/PARENT ACKNOWLEDGEMENT FORM

Robot Casserole FIRST Robotics Team

By signing this sheet I verify the following:

I have read through the handbook and understand the privileges and responsibilities that being a member of this team involves.

I understand that participation on the Robot Casserole Robotics team is a privilege.

I understand that I am required to **actively participate** and the consequences of my actions can ultimately lead to my removal from the team.

I understand that being a part of FIRST Robotics can provide me with knowledge and skills that will benefit me for a lifetime.

I understand that I have a wide variety of opportunities available to me while on this team and I am welcome to take advantage of them.

I agree with the philosophy FIRST upholds – “FIRST inspires in young people, their schools and communities an appreciation of science and technology, and of how mastering these can enrich the lives of all.”

I understand that, as a member of the Robot Casserole, my actions reflect on not only myself and my family, but also my School, Caterpillar, and other sponsors and supporters of our team.

I agree to act with gracious professionalism in all that I do while a member of Robot Casserole, Team 1736 and be respectful of mentors and other team members.

Student’s Signature

Parent’s Signature

Date