KILLER BEES 33

2014 Oakland County Competitive Robotics Association
Notre Dame Preparatory High School - Team 33 - Foundation Award

## Team Overview

For 20 years, Team 33, the Killer Bees have been participating in Competitive Robotics in Oakland County. Since the beginning of OCCRA, our team has been entirely student managed and executed; everything from planning agendas to designing and fabricating the robot. Our OCCRA season is not a prerequisite to our FIRST team, allowing students to pursue other interests in the fall while still maintaining the same amount passion and devotion to learning that has become a Killer Bee standard. We feel that by making OCCRA optional, every team member can achieve a balance in their extracurricular activities. Team 33 emphasizes active involvement during the OCCRA season, but has a flexible nature. This way, every member has an opportunity to create a tangible impact on the success of the team and hone in their skills.

## Team Communication

At the start of the season, the class of 2015 met and discussed their goals as upperclassmen leaders on the OCCRA team. The most important goals were to improve the communication among team members and parents and to increase involvement in OCCRA, especially in our freshman and sophomore classes. In addition to the “Weekly Buzz” emails for our FIRST team, we now send out mass emails specifically for OCCRA. These provide a list of available drivers, dates and locations of upcoming competitions, and any changes to our weekly meeting schedule. Additionally, the Killer Bees OCCRA team utilizes a free messaging system, GroupMe, which creates a group chat that will work on any type of phone as well as on a computer. This provides instantaneous communication with the whole team. The use of these two systems has greatly increased attendance and participation both at meetings and at competitions.

## Design Process and Team Structure

Our team is structured so that cooperation begins with the integration of upperclassmen and underclassmen, allowing us to have a coherent approach to creating a robot in an efficient manner while teaching new students. Upperclassmen provide knowledge and experience while underclassmen bring a new perspective and a passion for learning; the two groups naturally cooperate very well. We began the season with deciding what major functional objectives we would like the robot to accomplish, and brainstormed design ideas. From there, experienced upperclassmen worked with the team to model our robot in CAD using Autodesk Inventor. New teammates were shown the basics of using tools and were then able to apply this knowledge while taking apart the robot from the previous year. We then began fabricating the robot in various sub-teams: chassis, arm & lift, intake system, & electrical. However, no member is completely defined or limited by their job; for example, a

teammate can help to build the robot's arm one day and learn how to wire the next. Each sub-team has a dedicated upperclassman to oversee the project as a whole. We begin and end meetings with a group discussion about what each sub-team's daily goals and accomplishments. This keeps all members on the same page throughout the build season. We also use Google Docs to create a running list of our goals each week. Due to our relatively relaxed team structure, we are able to easily cooperate and overcome problems without much difficulty.

## Safety First

Safety is a priority on Team 33. Student team leaders enforce rules regarding hair and attire. Skirts and lanyards are not allowed to be worn, and safety glasses are required when operating machinery. When students are being taught about shop work and hand tools, they are taught the most safe and proper methods. Students are also always encouraged to ask questions and get help if they feel unsafe operating any equipment. During the OCCRA season, the Killer Bees operate out of a portable classroom. At the end of every meeting, all tools are neatly packed away, tables are cleaned, and floors are swept. Even though it seems simple, this daily routine teaches students about workplace etiquette and safety when sharing a space. Assuring the safety of every member is very important to the Killer Bees, and emphasizing safety on the team more prominently is one of our many goals for the upcoming year.

## Mentor Involvement

During the OCCRA season, mentors allow students to step up and develop leadership skills. Although students coordinate meetings, lead design discussions, and initiate outreach events, our mentors are still very involved with Oakland County Competitive Robotics. Our lead mentor, Jim Zondag, is a referee, builds the field, and serves on the game design committee. In addition, Julia Green volunteers as a queuer for all OCCRA events. We love seeing them support us and appreciate how they make OCCRA possible. Our faculty liaison, Susan McGinnis, is also a key part of OCCRA at Notre Dame Preparatory High School; as our supervisor, she helps us by coordinating snacks and spreading her love for robotics throughout the school. Miss McGinnis uses VEX robots to teach Science of Technology, a new class at our high school which has fostered more excitement about robotics within our school community.

## Community Outreach

Team 33, the Killer Bees, makes a consistent effort to reach out to our Oakland County community and share our passion for STEM with others. This year, we placed a special emphasis on encouraging young girls to pursue STEM activities such as OCCRA robotics. By showing them how fun and accessible careers in science and technology are, we hope to inspire more young girls to explore robotics.

This fall, the Killer Bees will collaborate with OCCRA Team 245 and the Girl Scouts of Southeastern Michigan to introduce STEM opportunities to young girls. On November 15th,

the second annual Girl Scout STEM Career Day will be held at Oakland University. As a part of completing the Product Designer badge, Girl Scouts will participate in hands-on activities that introduce them to engineering concepts. Students on our OCCRA team are leaders for this event and will be speaking to the Girl Scouts about future careers in STEM fields, as well as sharing personal experiences from the Killer Bees' robotics program. This event exposes young girls to the robotics programs in our community, especially OCCRA.

Additionally, Team 33, along with FIRST teams 2834 and 469, coordinated the 2nd annual Bloomfield Hills All-Girls Competition, an event at which teams reached out to the large population of Girl Scouts in our community. The Killer Bees OCCRA team assisted with the setting up and tearing down of the event, and served as queuing and field reset volunteers.

## OCCRA League Outreach

In addition to making a concentrated effort to positively affect our Oakland County community by giving back to various organizations throughout the year, we consistently provide tools, expertise, and students to help other OCCRA teams when in need. For example, at the first 2014 OCCRA competition this fall, Killer Bees provided technical support to other teams to help them get their robots up and running. Students were able to use what they had learned about electronics, programming, design, and fabrication to teach other teams. This not only creates a community of collaboration and professionalism amongst teams, being able to assist teams fosters confidence in students.

## OCCRA Awareness at School

The Killer Bees have risen to the challenge of promoting OCCRA to our school, parents, and community. We have worked with our administration to make the school more positively aware of robotics by displaying awards in hallways and at open houses. This fall, Killer Bee student leaders worked with our student council and other club leaders to sponsor a game booth at the school Homecoming dance. The addition of Science of Technology as a class has also increased awareness of robotics at Notre Dame Prep. Students are excited about STEM, and our OCCRA team has expanded this year as more classmates are exposed to competition robotics in the classroom.

The Killer Bees strive to sustain our OCCRA program through recruitments efforts at our school's club exposition nights and open houses. This fall, we demonstrated our OCCRA robot, and prospective members were able to interact with the machine and speak with current students. This experience is valuable in recruiting new members, and because of these efforts to promote OCCRA within our school, we are able to consistently maintain our

program year after year.

Team 33 makes a concerted effort to positively represent the OCCRA organization, its sponsors, and our school in everything that we do. The Killer Bees are extremely grateful to the Oakland Schools Education Foundation which makes this organization possible each year and for the opportunity to apply our knowledge in engaging, real-world applications.