

Welcome to *FIRST* Team 3667, the Mecanum Knights.

FIRST Team 3667, the Mecanum Knights, competes in The *FIRST* Robotics Competition (FRC) program for Grades 9-12. FRC robotics combines the excitement of sports with science and technology to create a unique varsity Sport for the Mind.™ Student team members and adult mentors work to distinguish the team as a dedicated group striving for excellence in all aspects of *FIRST* Robotics. Gracious professionalism, teamwork, and dedication to the ideals of *FIRST* are the team's goals. Gracious Professionalism as defined by *FIRST*:

Gracious Professionalism is part of the ethos of *FIRST*.

It's a way of doing things that encourages high-quality work, emphasizes the value of others and respects individuals and the community. With Gracious Professionalism, fierce competition and mutual gain are not separate notions. Gracious professionals learn and compete like crazy, but treat one another with respect and kindness in the process. They avoid treating anyone like losers. No chest thumping tough talk, but no sticky-sweet platitudes either. Knowledge, competition, and empathy are comfortably blended.

The purpose of this handbook is to provide guidance and to answer questions about the team, its policies and your responsibilities as either a student member or parent. Please read this information carefully to decide if you and/or your son/daughter will be able to make the commitment for participation in *FIRST* Team 3667 meetings, activities, events and competitions.

Team 3667, Mecanum Knights

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What is *FIRST* Robotics

FIRST (For Inspiration and Recognition of Science and Technology) was founded by Dean Kamen in 1989 to inspire young people's interest and participation in science and technology. Based in Manchester, NH, the 501 (c) (3) not-for-profit public charity designs accessible, innovative Robotic programs that motivate young people to pursue education and career opportunities in science, technology, engineering, and math, while building self-confidence, knowledge, and life skills.

Dean Kamen is an inventor, entrepreneur, and tireless advocate for science and technology. His passion and determination to help young people discover the excitement and rewards of science and technology are the cornerstones of *FIRST*.

***FIRST* Mission**

"The *FIRST* mission is to inspire young people to be science and technology leaders, 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 Team 3667

The Mecanum Knights

Team Mission

FIRST Team 3667, the Mecanum Knights, is dedicated to inspiring today's students for tomorrow's challenges, using STEM (Science, Technology, Engineering and Math) fundamentals and the principles of *FIRST* via a business-like model in which hands-on experience and student-mentor partnerships drive success.

FIRST Team 3667, the Mecanum Knights represents both of Port Huron's high schools, Port Huron High and Port Huron Northern. The team operates out of its shop and engineering lab at the Harrison Center. Mentors (that include, but are not limited to engineers, programmers, graphic designers and parents) guide student members through the design and construction of a robot.

The team motto is "Figure it Out". "Figure it Out" represents the team's dedication to students working to determine the strategies (both game and robot related) that will best meet the requirements of each year's game. "Figure it Out" also represents the unique opportunities afforded to *FIRST* participants. Students on Team 3667 become familiar with the real-world applications of science, math and more as they "figure out" how to construct a robot to compete in each season's game, raise the money to attend competitions and develop a marketing campaign that brands the team with a recognizable image in the FRC world.

Team Structure

FIRST Team 3667 is comprised of a team business manager, head coach, lead engineer, adult mentors, Student Officers; Captain and Lieutenant, student sub-team leads and student members.

Sub-teams

DESIGN PRODUCTION

CAD

Engineering/CAD is responsible for: designing the robot to meet the functional requirements and performance objectives as defined by the team; producing drawings and other documentation to enable the other sub-teams to do their jobs; updating the CAD files to match the as-built robot.

Build

Mechanical is responsible for: the building of the chassis and drive train; and any special device unique to the each year's game as well as all field components necessary for practice. The mechanical team also must monitor the robot's weight and center of gravity.

Programming

Programming uses software provided by *FIRST* to create a program that allows the robot to perform various tasks, and functions either autonomously or by human control. This group also is responsible for creating the remote control interface for the teleoperated control of the robot.

Electrical

Electrical is responsible for wiring all motors, compressors, motor controllers, sensors, relays, solenoids, C-rios, routers and web cams. They are responsible for ensuring wires are labeled and neatly arranged for ease of maintenance. Electrical also must provide ongoing materials cost updates to the Engineering Notebook's cost accounting work sheet (also known as a bill of materials).

Float

Float is critical to Team 3667's build and competition season. Float team members fill in voids/weaknesses on all other subteams. A member of float should be well-versed on all other subteams and able to seamlessly step in to help when and where needed/assigned.

RECORDS/SAFETY

Engineering Notebook

The notebook is the team's comprehensive record of each competition season. The notebook documents the team's strategy, its design and build processes, programming and electrical design and implementation, as well as team robot expenditures. It also should include various design iterations, programming screen shots, etc. It is the responsibility of the team's captain to regularly collect copies from team members' engineering notebooks in order to build a complete history of the robot.

Safety

Safety is needed to run any successful business or team. The safety team will ensure our team is compliant with all current *FIRST* recommendations. It also is the safety team's responsibility to keep the safety kits stocked, team fire extinguishers verified and in their proper place, and all personal protection equipment in working order. The safety team also maintains the team's safety book and ensures all necessary MDS sheets are current. This team leads safety demonstrations as well as team in-services.

Scouting

Scouting is one the most important elements of the competition season and is key to the team's success. The scouting team is responsible for knowing the capabilities of both allies and opposing teams at all district and championship events. It is the scouting team's responsibility to define our scouting strategy, collect data on teams and be prepared to present that data — as well as Team 3667's strengths — to alliance partners.

MARKETING

Social and Visual Media

Members of social media represent Team 3667 across social media platforms such as but not limited to Facebook, Twitter and Instagram and ensure that Team 3667's online pres-

ence is in keeping with the team's ethos of Being Knightly. The team's online blog, Knightly Newscast, Chairman's Video and all are video content also is the responsibility of the social and visual media team.

Graphic Design

The design subteam is responsible for maintaining the team web site as well as all team literature, signage and visual presence.

Chairman's Subteam

The chairman's subteam is responsible for the chairman's essay, visual aid and video, business plan and chairman's presentation. These components also must be documented in a team binder presented to the judges at each event.

Season Overview

All members of *FIRST* Team 3667 are asked to recognize that this program is a year-round commitment.

Recruiting

Recruiting begins in September and is followed by an interview process and pre-build-season training. All team members must reapply each September. Previous experience on Team 3667 does not ensure participation from year-to-year.

Build and Competition Season

FIRST FRC Kickoff takes place on the first Saturday in January and initiates the busiest and most rewarding part of the season: Build Season.

Attendance at the Kickoff event is mandatory. During this live televised event, the team learns what the game challenge will be for the year's competition.

During the six weeks that follow Kickoff, team members will brainstorm, design, program, build and test the competition robot.

Team Eligibility & Lettering Requirements

To be on the team:

1. Students must be enrolled at Port Huron Northern, Port Huron High School or in eighth grade at one of the Port Huron Area School District's three middle schools.
2. Students must maintain a minimum of a C+ average in science and math classes, must have passed all classes in the previous semester, and must be passing all classes in the current semester. Students who fall below a C+ average in their science and math classes or who are failing any other course will be at risk of being removed from the team.
3. During the six-week build season and six week competition season, students are expected make a significant time commitment to the team and must actively participate in meetings, workshops and events. During the build season, students must attend the *FIRST* Kickoff event and all mandatory meetings.
4. Students are expected to be reliable (on-time, prepared to work and to help clean up) and must demonstrate a positive attitude. All team members are expected to assist newer members, and be responsive to mentors and other adult volunteers.
5. Students are expected to represent their respective schools and the Port Huron Schools in a manner that is in keeping with the PHS Student Code Handbook with regard to general behavior and as defined under section XXI: Co-Curricular Activities Policy.
7. Students must participate in team fund-raising activities.
8. Students (and parents) are advised that travel to competition events is not guaranteed. Travel to competitions is a privilege that will be based on each student's level of participation (meeting the minimum requirements established above), including academic standing.

To earn a letter:

1. Student must be a high school student who is an active participant of the Team, and meet the requirements as defined above, including a time-commitment qualification of 80% of total team meeting hours during build and competition season (absences are noted)*. Student must be a member in good standing for two years.
2. Student must attend one *FIRST* competition in its entirety during competition season.

3. Student must participate in a minimum of four team activities (annually) that spread the *FIRST* message including, but not limited to: recruitment; mentoring a FLL team or FTC team; developing corporate relationships; and participating in events that raise public awareness, not only of *FIRST* Robotics, but of the need to increase cultural appreciation of the importance of science, technology, engineering and math.

*Students attending less than 80% of total team hours will be considered a reserve member and will not be eligible to earn a letter and may be ineligible for team travel.

Team Member Expectations and Behavior

Members of Team 3667 are expected to honor the FRC expectation of Gracious Professionalism.

Team Communication

All team members are required to have an active email address which they are expected to check daily from September through the end of regular build/competition season, and twice weekly through the off season. Team members and their parents also are required to use the website as their resource for all team-related information. The team calendar is updated regularly and the website is the place to find all answers regarding *FIRST* Team 3667. "I didn't know" **will not be accepted** as an excuse for missing any team activity.

Attendance Policy

To be a member of *FIRST* Team 3667 requires many after-school hours.

All team members are expected to participate in all mandatory team meetings, skill-building classes, fundraising activities and community events during the off season and build season.

These meetings are important to build the required skills, to determine student member sub-team interest, and to build team relationships, as well as to prepare for community-service events and fundraisers. As we get closer to kickoff and build season, meetings will become longer and more frequent. These meetings will be listed on the team calendar, available on the team website.

Mandatory meetings are scheduled for 6 to 9 p.m. Mondays year-round. During the build season, mandatory meetings will be 6 to 9 p.m. Mondays, Wednesdays and Thursdays and 10 a.m. to 5 p.m. Saturdays or as determined by the individual sub teams. Lunch will be provided during the Saturday meetings. Students are expected to attend team meetings a minimum of 16 hours per week. In other words, you are expected to treat team meetings as you would any other sport's practice schedule.

Attendance is taken at all meetings, fundraising activities and community events. It is the student's responsibility to sign in on the attendance computer or check in when he/she arrives at fundraising and community events. Students are expected to be **on time, and stay the required amount of time** – including the last ½ hour – which is dedicated to shop and classroom cleanup.

It is understood that our students may be very busy in other extra-curricular school activities. It is the responsibility of the student to manage and balance all of his or her activities, informing the mentors of other commitments. Student are expected to communicate conflicts to the team's coach. All team members are important and are needed for the success of the Team 3667 as a whole.

Team members who are unable to attend a team event **are required** to notify the team's coach and their sub-team mentor in advance of the event. Team mentors put in countless volunteer hours toward this effort, putting aside family events and working around their jobs and other commitments. There is nothing more exasperating for mentors who have gone to such lengths, than to arrive at the shop and not have students there. Team members are asked to be mindful of this and to have the courtesy to notify coach (and their subteam coach) every time they are unable to attend.

Absences

As with school, or any athletic team, absences should be reported with a written note to absences@team3667.com. Students with unexcused absences will be awarded a yellow card for each instance. Three or more yellow cards will result in dismissal from the team.

Fundraising

Fundraising is an important part of the team's budget.– Every student is expected to participate in the team's fundraising efforts. Each student is required to raise \$100 minimum in individual funds and to participate in the team-planned fundraising activities.

Team Shirts

Team Shirts **MUST** be worn to all team events, community service activities, fundraisers and demonstrations in order to receive credit for the activity. For new students, purple T-shirts or PH or PHN attire will be sufficient.

Report Cards

At the end of each marking period, students must provide a copy of their report card to the team's business manager.

Students who fail to meet the minimum grade requirements for that marking period will be on probation for the remainder of the current marking period. During this probationary period they must provide the team business manager a weekly progress report for all classes in which they were not meeting the requirements.

Students who fail to show weekly improvement at the end of their probationary period will be suspended from the team for a period of one marking period in order to focus on their studies. At the end of the suspension, students who recover their grades may resume activity; those who have not recovered their grades will be dismissed from the team and may apply for membership the following season.

In addition to reporting marking-period grades, ALL students must report their grades to the team's business manager via a progress report on the Monday preceding a competition week (essentially 10 days prior). Students who are not meeting grade requirements on that Monday will have until the Monday of competition week to resolve reasonable issues (assignments missing due to illness, teacher absences, etc.). Assignments missing due to irresponsibility, a lack of student priorities, etc., will be considered the student's fault and will render the student ineligible for a school absence for Friday competitions.

Homework

Because such emphasis is put on grades, homework comes first. Students are welcome to work on homework at meetings during the season. Homework must be conducted at an appropriate study area in the team classroom.

Inappropriate Behavior

As a member of FIRST Team 3667, you are an ambassador of the team, your family, your respective high schools, and the Port Huron Area School District. At all times, you are expected to behave in a manner that represents each entity in a positive way.

Suspensions

If a student is suspended from school they also are suspended from the team, as per the PHASD Student Code Handbook.

Students and parents should note:

Any inappropriate sexual behavior (as defined by the PHASD student handbook), can be cause for immediate dismissal from the team. In addition, inappropriate use of computer assets (computer usage violations that affect the team's computer/internet assets) will result in immediate dismissal from the team. Such as, but not limited to, the Team3667 website, team Facebook account, team Group Facebook account or team Twitter account.

Discipline Policy

Behavioral issues will be handled with the awarding of a Yellow Card. Students who receive a yellow card will report directly to the head coach who will determine the consequence, this may include a phone call home to obtain a ride for the student to be sent home early.

Competitions

All eligible students are expected to travel with the team on the bus to competitions. Bus rides provide time for buddy assignments, strategic game planning and team

bonding. It is difficult to do these things if we are not traveling as a team. Return travel with a parent or guardian is allowed on the final day of an event, but must be approved via written note to the coach before the event.

Travel

It is a privilege to travel with the team and as such, travel is allowed only if the student earns the privilege.

Medications

Any students taking any medications while we are traveling need to have the list of medications on file with the team manager. If medication is to be taken while away, it must be in the original prescription bottle with the prescribing directions on it. Any students with medical conditions such as allergies, asthma, diabetes, seizure disorders, or any other conditions that could be problematic during travel need to let the mentor know in writing and include appropriate treatment and emergency contact information. This information will be kept confidential. A copy of the student's insurance card is requested before he/she can travel.

Parent Participation/Responsibilities

Competition Volunteers and Food

Parents are a key part of our team's success. Parents motivate and encourage the dedication of their student.

Each student's family is required to provide one volunteer for one day at one *FIRST* competition each year. Volunteering can be done at any competition – one at which we are competing, or another that works for your schedule. Parents may also divide one day up between several people. Please register to volunteer at: firstinspires.org.

A parent, or representative of each student member, is required to help with food during build season. Lunch is necessary on Saturdays during build season (Jan. 7 through our last competition). Parents are asked to contribute to the team by providing one of those lunches.

Code of Conduct

Student/Parent Contract

All students must know, understand and comply with this Code of Conduct, with PHASD Code of Conduct, and *FIRST* team policies of fair play and 'gracious professionalism'.

All students will comply with requests made by teachers, engineers and team coaches/mentors at school, Mecanum Knights classrooms and shop, at all *FIRST* competition sites and any *FIRST*-related activities.

All Mecanum Knights safety precautions must be followed at all times, including the proper use of safety goggles and other safety equipment in all specified areas.

School grades and disciplinary issues will be taken into account for eligibility for any travel with the team.

- A C+ or higher in math and science must be maintained and all other classes must have passing grades.

Prohibited behaviors during any, and all, *FIRST*-related activities:

- Inappropriate language toward adult and student team members
- Disruptive, or inappropriate, conduct
- Arriving late for group activities and travel
- Inappropriate dress/attire (revealing or sexually suggestive clothing, clothing that has any reference to alcohol, drugs, sex or weapons)
- No harassment of any type, including sexual, gender-based, or ethnic slurs.
- No vandalism of any type at school, Mecanum Knights' classrooms and shop, venues or at any *FIRST*-related location
- Using, possessing, selling or being under the influence of any and all illegal drugs, controlled substances, alcoholic beverages, or tobacco products (Violations of drug, alcohol and tobacco rules will result in immediate travel home, at parents' expense.)

Please read the **Code of Conduct** and the **Engineering Process Agreement** on the following page. Sign both the Code of Conduct Contract below and the **Engineering Process Agreement** on the following page, detach at dotted line and return to the team's business manager.

My student and I acknowledge we have read this handbook in its entirety.

Student

I agree that I understand the information presented in the Team Handbook and understand the requirements outlined in this Code of Conduct. I understand that I must act responsibly and respectfully at all times, and that school work comes before team work. I must maintain good academic standing in order to remain on the team.

Student Printed Name: _____

Student Signature: _____

Date: _____

Parent/Guardian

I understand that my student has chosen to be an active part of this team, and that while any level of participation is encouraged, my student must meet the team requirements in order to participate in team travel. I also understand that I am part of those requirements and agree to attend the parent information meeting, at least one team activity, and provide at least one meal for the team during the build season. I understand that parents can be a vital part of the team, and are a big help in getting many of the team activities accomplished. I will do my best to support my student and the team in this endeavor.

Parent Printed Name: _____

Parent/Guardian Signature: _____

Date: _____

Team 3667 Engineering Process Agreement

My signature below indicates that I understand and agree to the important role the engineering process plays in the construction of a competitive robot. My signature also confirms the following: I understand instruction in the Engineering Process is included in the Next Generation Science Standards; this requires that the Scientific Method and the Engineering Design Process be taught side-by-side; I clearly understand that construction of the robot will not begin until all steps of the engineering process, as listed below, have been met; I clearly understand the importance of documenting this process in engineering notebooks and each sub team mentor will regularly require checks of said engineering notebooks.

The steps of the Engineering Process are as follows:

1. Ask: Identify the needs and constraints (defined by the Rules of the Game and Robot Construction)
2. Research the problem (in FIRST's case, define your strategy)
3. Imagine: Develop possible solutions
4. Plan: Select the most promising solution
5. Create: Design and build a prototype, using the proper mathematical and design tools/methods
6. Test and evaluate prototype
7. Improve/redesign if needed

Finally, my signature confirms that I fully understand that in a six-week design and build season, there may be instances in which students have to defer to the expertise of their mentors without the time for elaborate explanation. The mentors confirm that deference to their expertise is not a license to "take over" and that when such decisions are made, they will be recorded as a teachable moment to be revisited during the off-season. Both students and mentors may record such moments in Team 3667's Teachable Moment Log.

Student Printed Name: _____

Student Signature: _____

Date: _____