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About Our Team

What is FIRST?

Team 4698, Raider Robotics, competes in the FIRST Robotics Competition. FIRST is an acronym meaning “For Inspiration and Recognition of Science and Technology.”

The FIRST Robotics Competition is an exciting, international competition that teams professionals and young people to solve an engineering design problem in an intense and competitive way. The program is a life-changing, career-molding experience – and a lot of fun. 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.

Two values essential to FIRST are Gracious Professionalism and Cooperation. 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. Cooperation is displaying unqualified kindness and respect in the face of fierce competition. Cooperation is founded on the concept and a philosophy that teams can and should help and cooperate with each other even as they compete.

By competing in FIRST, you are part of an international organization made up of hundreds of thousands of students, mentors, and volunteers. You will have an opportunity to be part of something truly larger than life and have the ‘hardest fun you’ll ever have.’

Name and Number

Name and Number FRC Teams are assigned numbers based on when they start competing. Our team started competing in 2014, and we were assigned the number 4698. Our team name is Raider Robotics.

Mission and Vision

Raider Robotics provides opportunities for high school students at Rio Americano High School from Sacramento, CA to participate in a competitive and meaningful way through the FIRST robotics competition. Students learn career-oriented skills in engineering, design, mathematics, computer science, and are inspired by industry professional mentors and FRC alumni dedicated to helping foster a competitive FRC team and educating team members.

Core Values

- We are a team.
- We do the work to find solutions with guidance from our coaches and mentors.
- We honor the spirit of friendly sportsmanship.
- What we discover is more important than what we win.
- We share our experiences with others.
- We display Gracious Professionalism™ in everything we do.
- We have fun!

Who Can Join?

There is a place on Raider Robotics for everyone. Team membership is reserved to high school students but younger students are more than welcome to participate in team activities such as training, fundraising, and competition season. College students and above are invited to come mentor.

Team Structure

Team Structure Like most FRC Teams, Raider Robotics is comprised of both adults and students. Beyond that, the team has some basic structure. Team 4698 prides themselves on enabling the students to make as many of the important decisions for the team as they can. There are limits to what decisions students have a say in and some important decisions need to be made by mentors on the team to ensure the team functions as expected by all involved. Since FIRST® is a mentor-based program, the mentors on the team provide guidance and help set the team's goals and direction. Students and mentors work side by side to build the robot, complete projects, and make up the team.

Mentors

The adults on the team are known as mentors. Much like the students, the mentors on the team come from all over and have a diversified set of skills, backgrounds, and talents. They are teachers, parents, scientists, engineers, college students, and, above all, gracious professionals. They volunteer their time with the team to give something back to the world and help inspire and challenge students. FIRST® describes mentors:

FRC Mentors play a vital role in the success of their students. Mentors work extensively with team members during the build season, designing, building, and fabricating a functional robot for Competition. Their expertise is the catalyst for the team's and students' success. FRC Mentors are the major distinction between the FRC program and other robotic competitions as they are wholly the professional role model for the student. Mentors engage and inspire students in ways far beyond science

and technology. They enable both students and adults to appreciate the value of sportsmanship, teamwork, and Gracious Professionalism.

Students

Students are the core of our team. We would not be a team without them. Students have access to mentors and cool equipment that can help them learn applicable professional skills. Through hands-on experience, students learn how to use tools, fight against (and work with) physics, design the robot, prototype, work with circuits, design strategies for competition, code the robot, troubleshoot the robot, and acquire many other engineering skills.

Beyond engineering skills, students also develop the skills necessary for the professional workforce, no matter which career path the student's choose to follow. Students talk to judges during competition, learn how to work on a team, are involved in the development of a project from start to finish, search for and write grants, look for sponsors, network with colleges and engineering companies, and accomplish many other tasks that prepare them for any career they choose.

Unlike most FRC teams, Team 4698 is not divided into sub-teams. While some students may prefer to stick to a specific subject field, all students on the team, including leaders, are encouraged to become fluent in all areas of the team. This fluidity allows for more flexibility throughout the team.

Student Leadership Roles

Team 4698 has many opportunities for students to gain leadership experience. Whether it's leading or managing a project or organizing an event, all students will have the opportunity to feel "in charge".

Subject Fields

There are many different required skills that go into participating on a robotics team. Additionally these skills can reach outside those of your standard STEM fields. On Team 4698 we like to identify these fields and use them as a means to organize tasks and projects throughout the year.

Mechanical

Students work with the mechanical component of the robot including the assemblage of different mechanical systems and manufacturing of different components on machines. Students communicate closely reference and follow plans laid out in design software like Fusion 360.

Electrical

Students layout the brains of the robot. They use industry practices to route cables and tubes throughout the robot. These students are organizationally inclined and are responsible for the tidiness of the wires and neat layout of electrical components. Patience and attention to detail are critical for success in this field.

Programming

Students will create the software that runs the robot. They create drive code that the drivers interface with and autonomous functions that drive the robot without human control. They program the vision systems that enable those capabilities. They also provide input for sensors and electronics that will go on the robot. We currently use C++ to program the robot, But we might be moving to Java.

Design

Every project starts with a good plan. Students will model the robot using CAD in Fusion 360. This model can then be used to reference, generate machine code, or rendered in simulations. Students who participate in CAD and design will find problems with our designs virtually, before we make them. This is a major part of our process and allows us to iterate our designs quickly.

Strategy

All students are responsible for analyzing game rules and possible strategies, keeping up with the evolution of those strategies throughout the season, and tracking the performance of teams at the competitions that we attend. Skills involved: statistical analysis, careful and insightful observation, and spreadsheet manipulation for scouting.

Fundraising

Students educated in fundraising will help the team to raise the necessary funds to register for competitions and buy parts for the robot. A significant portion of this is done outside of build season. Students will write grants, encourage donations, develop relationships with existing and new sponsors, and write thank you notes!

Branding

Team 4698 has constructed a brand that its members are very proud of. While all students are required to uphold the team standards, some go the extra mile to create social media posts, videos, and infographics, promote the principles of STEM education at local schools and community events.

Yearly Schedule

Summer Season

Summer Season begins in mid June. The summer season is comprised of many activities that will be beneficial in the pre-build and build season. Weekly meetings will be held in the summer. Meetings will involve the repair and improvement of our previous year's robots, the design and construction of new mechanisms, and fundraising and outreach efforts. No experience is required.

Pre-Season

Pre-Season begins in mid September. During the Pre-Season, students are still active with the team, but the workload will be lighter. There will still be instructional classes for CAD, programming, electrical

engineering, and tool safety and regular team meetings, with the dates announced on a weekly basis. The team will meet an average of twice per week. It's important for students to maintain their grades during this time period, because once build season begins it will be very hard to balance your time.

Build Season

This is like the “Hell Week” for football, except that in FIRST, it’s spread out among six weeks. Six weeks may seem like a lot of time, but it truly isn’t. In the beginning of January, there is an official kickoff, streamed worldwide, which explains the new challenge that each team must accomplish during the competition. The FIRST Kickoff for Sacramento happens at Davis High school the first weekend in January. All team members are encouraged to attend - it is required for all team leadership. At kickoff, we pick up our Kit of Parts (also known as KOP).

During these six weeks, teams construct a robot from scratch, going through all of the phases of building a robot. These include design, building, and programming. Build season can be challenging for many, but relax and enjoy it. Again, it may be just a month and a half, but before you know it, it’s stop-build day. The team will meet an average of 4 times per week (three weekdays, and all day Saturday). Sunday meetings may be called if additional time is needed. Be prepared to stay late at night. Time management is crucial.

Team 4698 traditionally builds an identical practice bot during the build season to allow the team to continue to fine-tune programming and improve mechanisms that will be installed on the competition robot, within the withholding allowance. Work continues following day until competition, but the schedule is less strenuous and meetings are called on an as needed basis.

Competition Season

The Competition season starts the week after week six. Regional competitions around the country take place over six weeks.

New Members

Before Joining

Talk to Mr Cole. Please understand, robotics team is part of the Engineer and Manufacturing Pathway is open to only those students. Although we wish we could accept everyone, our facilities can not handle a large amount of students.

After Joining

As a new member, you need to complete the following as soon as possible to join the team as an official member:

- Read the Team Handbook (hey, you already are!) and sign the Agreement Form
- Join our team communication systems by joining the Robotics class on Google classroom- Get the enrollment number from a mentor
- Sign up on STIMS (the Student-Team Information Management System)
 - Go to <https://www.firstinspires.org/>
 - Create an account, go into your dashboard then click apply to team
 - Enter our team number 4698 and your contact information
 - Make sure you select the option to complete the consent form electronically - we do not want to deal with paper consent forms.
- Order a team shirt
- Pay the Team Fee

Peer-Mentorship Program

Beginning in the Pre-season, new students will participate in a peer-mentorship program. Students voluntarily agree to have a veteran team member as a partner to help them with basic knowledge and any questions. Ideally the veteran team member has a new team member who is interested in the same focus areas on the team. The purpose of this program is to train the new members with skills that will be vital during the build season, especially in the engineering fields. As the veteran student works on the robot, in CAD, or on the code, the new member can ask the veteran student any questions he or she has unobtrusively. This is an effective way for students to quickly close the gap with what they know and don't know about a particular subject; the peer-mentorship program is mainly for pre-build season purposes, when the overall team focus is gaining knowledge and experience.

Membership Requirements

Attendance

All members are required to **attend 80% of meetings during the build season in order to be considered a member and be allowed to attend a FIRST Robotics Competition event as a team member**. If you are concerned about your ability to maintain attendance, please discuss your situation with the lead mentor. Think about it this way: a football coach would cut a student who isn't showing up to practices. If your commitment to the team becomes a problem, Team 4698 reserves the right to terminate your involvement with the team.

Rules

Team members must follow the rules of Team 4698. The basis of the rules is quite simple: be respectful of others and be safe. These rules cover any violations any team member may make and here are some

examples: Playing Fortnite or other games is disrespectful of the time and work others are putting into building a successful robot. Thinking that your job is more important than others or that you contribute more than everyone else is disrespectful. Juggling pieces of sheet metal is not safe. Using a jigsaw without safety goggles is not safe. During your time with 4698, you will be instructed in proper safety practices for handling various equipment and materials, and you are expected to consistently follow these safe practices.

Additional Rules

- **If a student leaves before a work session is over, he or she must spend AT LEAST 15 minutes cleaning up (inform a veteran member or a mentor).**
- **Students must be respectful to everyone (whether they are present or not).**
- **Horseplay and video games are not tolerated. If work for the day is complete, make sure your ride is coming and work on homework.**
- **Just use common sense and treat other like you would want to be treated!**

Meetings

The team will meet at Rio American's Manufacturing Lab and Computer Lab. All team members are expected to attend the regularly scheduled meetings- depending on your team meeting in "Off Season" and Full time in Season. You are expected to work while at the meetings. If you are actively avoiding work or become a distraction to others working, you will be asked to leave. If you are having trouble finding work simply consult a mentor or veteran student. Look at the to do list on the side board in the lab. The team will always contain up-to-date projects for all subject fields. If there is ever any ambiguity over what you should be doing, consulting your mentor is a perfect way to get back on track. If all else fails, observe someone that is working, while staying out of the way. Pick up on what they are doing or offer to find tools or supplies that they need. Ask questions about what they are doing so you can learn how to do this job on your own next time. Walking around and asking if people have jobs for you usually does not work.

Safety

Safety Training

Robotics is an activity where students regularly work with sharp metal and dangerous tools, and it can be very hazardous if proper techniques are not put into place. All members must listen to fellow team members so that they will act safely. Mentors always have the final word in any situation where safety is at stake.

Emergency Procedures

Emergencies and Injuries – Procedure

- Check – Check the scene. Is it safe? What happened? Who is injured? Is someone there who can help you?
- Call – Find an adult mentor. Call 911. If an emergency occurs, the operator will need to know your name, location, telephone number, and description of emergency.
- Care – After contacting emergency care and adult mentor(s), use the first aid tips and kit to care for the victim. Remember, the best thing you can do for someone who is severely injured is to help get an emergency care professional as fast as possible.

Safety Rules

- No student is ever to work without a supervisor on site.
- Any student intending to use any potentially dangerous tools must be trained about how to safely use the tool by an adult mentor.
- When finished using a tool, it must be returned to its designated location.
- At the end of every work session, all tools and materials must be put away in the case, bins or tool boxes.
- If a power tool malfunctions, it must be reported to a mentor immediately and must not be used until repaired or replaced.
- Electrical devices of any kind may NEVER be powered by daisy-chaining cords or power strips.
- Always wear safety glasses when operating or near somebody who is operating power equipment. If you are unsure in a given situation, wear safety glasses.
- No loose hair or long clothing is permitted during the use of power tools.

Financial Obligations

The 4698 has an annual team fee that helps cover registration costs, parts, tools and equipment, and other expenses. This annual fee gets you one team shirt and a laser engraved name tag. Finances should not prevent anyone from joining the team. If you have any concerns about your ability to cover the team fee, please discuss your situation with a team mentor.

In addition to the team fee, there are other periodic expenses. Team members are required to pay for their own travel expenses, which include hotel rooms, transportation (if not provided), and airline tickets for out of state competitions.

Donations to the team qualify for employer matching contributions. Many companies in the engineering and technology sector already have established relationships with

FIRST for supporting teams, either providing financial support, in-kind donations, or donations based on volunteer hours, so please ask!

Team meals are provided by parents on a rotating basis - you will be expected to provide one or more meals over the course of the year. See the Parent Guide for more details.

Parent Guide

Role of Parents

Parent support is an invaluable asset to our team. Team 4698 successes are due to the combined efforts of hard-working student participants, dedicated volunteer mentors, and very importantly, supportive parents.

Roles:

Supervising - At every work session or team meeting, a parent supervisor must be on duty, therefore, it is vital to the program that the team have many parents willing to help out. The role of a parent supervisor is to ensure the safety of all team members under their supervision.

Meal support - Another role of parents is to help provide meals for the team. During the build season, team members stay as late as (or later than) 10PM several days per week, and they need food to keep going.

Acquisitions - Part and material acquisition is another important role. Parents who help with acquisition run errands to obtain merchandise, turn in their receipts, and receive reimbursement at the end of the build season.

Mentoring - Engineering mentors are not the only mentors in FIRST. If you have experience in any field related to any aspect of the team's efforts, we'd love your help!

Travel and Competition Support - Arranging logistics for 20+ people can be a daunting task. From setting up "home base" for fans, parents, and supporters outside of the main pit, to coordinating food, to hotel and transportation for the second regional, there is a huge amount to be done.

Consent Forms

Before taking part in any team activity, your son or daughter must have his or her FIRST consent form completed. When your son or daughter joins the team, he or she will register through STIMS, and enter your email as part of the process. You will receive a link to complete the consent form electronically.

Sponsors

What are Sponsorships?

A sponsorship is a grant of financial, material, personnel, or manufacturing resources to the team. The ability of companies to support the team can change from year to year, so we must be constantly vigilant about seeking support.

Potential Sponsorships

All team members should be constantly aware of potential sponsors. If you have an idea, contact the Funding committee chair. Personal connections are far superior to “cold-calls” to potential sponsors.

Communications

The team's primary form of communication is Slack. Team members will be invited to the team chat prior to registration.

Authority of the Handbook

The rules and policies set forth in this handbook are binding and must be followed by all team members. The team mentors (along with suggestions from veteran members) have the authority to modify the handbook at any time; the team will be notified of any modifications.

Contract

By signing below I acknowledge and understand all points listed below.

Students:

I have read the handbook describing Team 4698 and agree to comply with the policies outlined within.

Participation on the team requires attendance at meetings and I understand the yearly structure of these meetings.

I will be responsible to arrange my own transportation to robotics events.

The equipment used during construction of the robot can cause serious harm and injury if not used correctly. Students are not permitted to use any piece of equipment until they have been instructed on its safe use and are not permitted to use any piece of power equipment without adult supervision.

I agree and consent to allow my photographs, name or comments to appear in media related to Team 4698.

I understand that violation of any of the policies above is punishable by dismissal from the team.

Parents:

I have read the Parents Guide and am familiar with the rest of the Team Handbook.

I agree to help supervise sessions. _____ agree to help provide meals for the team. _____

Student Name _____

Student Email _____

Student Signature _____

Parent Name _____

Parent Email _____

Parent Signature _____

Student Phone _____

Parent Phone _____