

TEAM HAND BOOK

ROBO'LYON 
The FIRST French Team



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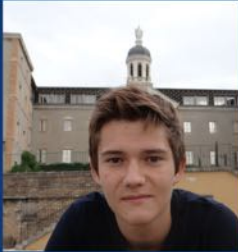


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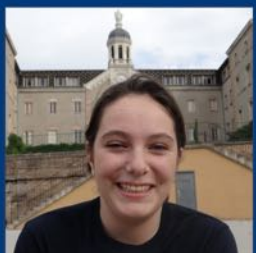
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1. WHAT'S ROBO'LYON ?
2. WHAT'S FIRST®?
3. WHAT'S THE FRC ?

O!

INTRODUCTION

1. WHAT'S

RO



Robo'LYON is an association of high school students who participate in the FIRST® ROBOTICS COMPETITION (FRC), an international robotics competition.

The ROBO'LYON team is made up of about thirty students from the second to the last year of high school.

The selected students can join the association in the second or first year for a two or three year commitment.

BO'

LY

Each year, we create a new robot according to the game of the year and the specifications proposed by FIRST®. We imagine, design, realize and program our robot entirely.

Robo'LYON's activities allow everyone to discover, learn and practice science, math and technology around a robotics project.

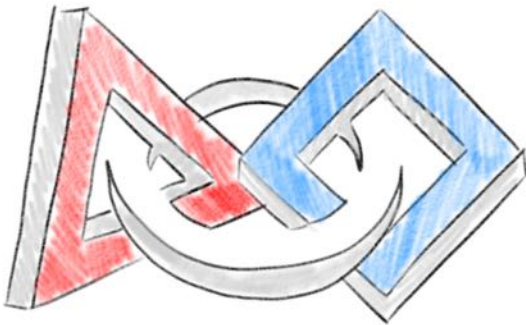
Students also learn to share, communicate and transmit their knowledge.

ON

INTRODUCTION

2. WHAT'S

FIR



It is a non-profit organization founded in 1989 by Dean Kamen.

FIRST® (For Inspiration and Recognition of Science and Technology) began its first competition in 1992 with some 28 teams in New Hampshire. FIRST aims to promote entrepreneurship, teamwork and science and technology.

Today, the three FIRST® programs reach more than 700,000 young people around the world each year. FIRST® is an international organization that reaches thousands of students worldwide, from elementary to high school. For more information, visit <https://www.firstinspires.org/>.

ST®

INTRODUCTION

3.WHAT'S

FRC, short for FIRST® Robotics Competition, is FIRST®'s oldest robotics program.

THE

FIRST®

It is about providing a rigorous engineering challenge to high school students in grades 10-12 while teaching leadership, collaboration, and project management. It aims to promote entrepreneurship, teamwork, and science and technology.

ROBOTICS

FRC teams entirely create a robot able to carry out playful tasks which change each year. During the launch (kick-off), teams receive game manual as well as an explanatory video of the game of the year.

For more information, you can visit
<https://www.firstinspires.org/robotics/frc>

COMPETITION

INTRODUCTION

1. A YEAR AT ROBO'LYON
2. RECRUITING
3. MENTORS, STUDENTS & ALUMNIS
4. ORGANIZATION
5. CHARTER AND INVESTMENT
6. MISSION

02. OUR TEAM

A YEAR AT ROBO'LYON

Pre-season : (from the beginning of the school year to the Kick-off in January). It is training time: newcomers discover the organization, the different tools (software, machines...).

It is also an opportunity for the "old" team members to improve their skills in their favorite fields and to learn about other areas of expertise.



Kick-off : It takes place over a weekend, the first week of January, and is the official launch of the FRC season. We receive, along with the 4,000 or so teams around the world, an explanatory video of the year's game along with the game manual in English. We analyze the documents and develop a game strategy. We decide what the robot should do and how it should do it. We list the mechanisms and create groups of students who will work on the different parts to create.



Season : During 6 to 8 weeks we create the robots. Oh yes, because there are 2 identical robots to create! The first robot leaves 15 days before the beginning of the competition. The second robot will be used to train and to fine-tune the settings. It is during this period that the team must be very implicated to build the best robot and communicate effectively.



Competition : It is THE WEEK ! It is a week of meetings, stress, joy, tears... For a few days, the whole team goes abroad to experience this competition with teams from all over the world.

Post season : It's retrospection time of the season. We list our successes and the different points to improve.



Recruitment course : Students applying to ROBO'LYON are interviewed and selected to participate in the summer camp held in July. In one week of training, they discover the FRC season in an accelerated form.

RECRUITING



1

Communication to students
and presentation of
Robo'Lyon in the classrooms.

Online registration form.

2

3

Preliminary interview when
there are too many
applications.

Mandatory summer camp
and pre-selection at the end
of it.

4

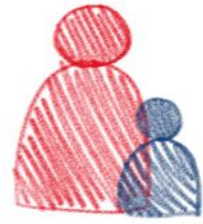
5

Trial period during the
pre-season.

Early December: the selected team is ready for the
launch of the season!

M

ENTORS



The mentors supervise, train, advise and ensure the smooth running of the association. They are volunteers and get involved to the extent of their ability and skills.



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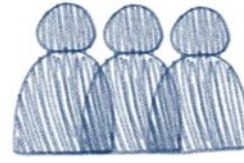
TUDENTS



This is the lifeblood of Robo'Lyon! About 8 students per level in order to guarantee the continuity of the team from one year to the next and to maintain our level of excellence. This year, 25 young people, including 7 girls, are eager to acquire new skills.

C

CODIR



Within ROBO'LYON, there is a steering committee (CODIR) made up of mentors and student referents. A meeting is held approximately every 2 months. 3 students are elected to the CODIR by the other students. They are the ones they can turn to with their ideas, requests and questions to be submitted during the CODIR meetings.



A

LUMNI



Former team members, while pursuing their studies after graduation, continue to give back to the community by sharing their knowledge.

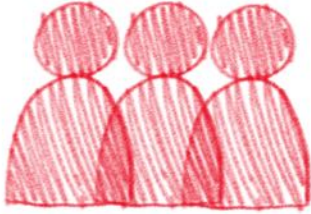




S

We take our inspiration from the professional agile methods in order to work fast and efficiently.

Scrum method is essentially based on continuous improvement and adaptation.



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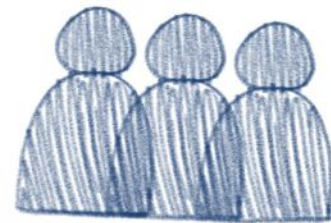
We work in “group projects” that we define from a work list we elaborate during Kick-off (backlog)

There is no hierarchy. Everyone is able to share his ideas and knowledge with the team. This is how we maintain flexibility, creativity, and efficiency in the team.

R

Every day starts with a “Daily meeting” during which we check what has been done, what will have to be done and what we should start to do straight away. We also share all the important team informations.

U



M

We define together, as a team, the week's objectives.

In order to make sure that every projects are on their way, the different “projects teams” have a meeting on Discord on a week's evening.

METHOD

TIDYING

Having clean and organized HQ is of major importance. We use the 5S method to optimize the tidying.
These are the rules :

JAPANESE WORD	ACTIONS ACCORDING TO THE WORD
SEIRI	SORT, DISCARD, RECYCLE, ARCHIVE, PLACE WORK TOOLS ACCORDING TO THEIR FREQUENCY OF USE
SEITON	TIDYING UP, CLASSIFYING TO LIMIT PHYSICAL MOVEMENT OR CARRYING HEAVY OBJECTS, OPTIMIZING THE USE OF SPACE
SEISO	CLEAN, REPAIR
SEIKETSU	ORDER THE DOCUMENTS OR THEIR WORKSTATION SO THAT ANOTHER PERSON CAN FIND THEIR WAY AROUND
SHITSUKE	BE RIGOROUS, APPLY THE 4 PREVIOUS OPERATIONS AND MAINTAIN THEM OVER TIME

The 5s method have numerous advantages : less materials loss, a safer and more pleasant workspace.

- Each tool or material must be immediately stored back in the right place after being used. We have 4 servants which allow us to work intelligently without losing the tools.
- Each item has a dedicated place in the workshop: boxes, shelves etc...
- If a student does not respect the rules, the mentors can decide to ban him/her from the workshop.
- A person in charge of tidying up the room can be appointed to ensure that the room is clean. During one day, he/she tidies the room and makes sure that all members respect the rules of tidiness.

CHARTER

STUDENT COMMITMENT:

As a student in the project I commit throughout the 2022/2023 school year to comply with ALL of the following (Failure to comply with the commitments listed will result in non-renewal of membership the following year):

BE PRESENT: We are a team. To be part of the team, I must be present, on time and for the entire time the team meets (see attached calendar)

SPEAK UP: Communication is the key to teamwork. Your ideas matter and we want to hear them.

LISTEN: There is a time to talk and a time to listen. Everyone's ability to listen is the key to a successful team.

LEARN: The goal of our program is to make you smarter. Learn as much as you can, and try hard.

PROGRESS: Take ownership of your work and become a valued member of the team. Good, hard work benefits everyone.

GROW: All team members are treated as adults as long as they act like an adult.

BUILD: Each of us learns. We don't put down our team members, we support them. If someone needs help, we help them with the intention of helping them build themselves and the team.

TIDY / CLEAN: Our workspace is our home. We must all work to keep it clean, safe and productive.

ACTIVATE: Time is our most valuable resource. Always keep quality in mind, but get things done quickly.

INVESTIGATE YOURSELF: Robotics is hard work and hard work is fun and FUN. Live it to the fullest because there is nothing better and more rewarding.

NEVER GIVE UP: We succeed because we never stop trying to improve. As long as we don't give up, we win.

I ALSO COMMIT TO :

- To use the image of Robo'Lyon while respecting the values of the association.
- Not to diffuse the access codes of the Robo'Lyon network outside the members of Robo'Lyon and to use them legally. Any illicit action will lead to exclusion from the association. In accordance with the regulations, the contact information of all connections will be kept for 2 years.
- Respect the COVID sanitary rules (wash your hands regularly, wear a mask, clean the tools used... when the situation requires it...)

CHARTER



PARENT ENGAGEMENT:

Parents must meet face-to-face with an adult team member (a mentor or teacher).

Parents are expected to support their child in his/her schoolwork.

Parents acknowledge that they have been clearly informed of the importance of their child's involvement. They therefore agree to their child's full participation in this year's program.

DRESS CODE :

The Robo'Lyon outfit consists of a t-shirt and a red jacket.

This outfit must be worn during events. In the workshop, the outfit is strongly recommended, but is not mandatory.

During the competition, the outfit is required , it highlights our sponsors present on the competition t-shirts of the year.

Team gear may be exchanged with other FRC members, but should NEVER be sold to them.

Finally, hair must be tied back for safety reasons.



INVESTMENT AND TIME SPENT AT ROBO'LYON :

The key word for those who want to join Robo'Lyon: investment. The presence of the students is required on the days defined in the calendar of the beginning of the school year. It is necessary to be present every Saturday from 9am to 5pm, then during school vacations and to be available one evening of the week for vocal meetings.

During the season, from the beginning of January until the competition, the pace accelerates. It is a very busy period during which all team members must be involved as much as possible (weeknights, weekends...) because the building period is very short!

OUR MISSION



Robo'Lyon's main mission is to help students grow; to give them the opportunity to acquire technical skills and "soft skills": oral fluency, teamwork capacity...

Robo'Lyon empowers students to become the leaders of tomorrow. Robo'Lyon gives everyone access to STEM (Science, Technology, Engineering and Mathematics) from an early age.



OUR TEAM

1. CAD, PROTOTYPING AND MACHINING
2. ELECTRONICS, PNEUMATICS AND PROGRAMMING
3. PILOTING, SCOUTING AND FIELD
4. COMMUNICATION AND TOOLS

03. jobs

C A D

OMPUTER
IDED
ESIGN

To imagine, design and model the different elements / mechanisms of the robot on 3D software. This is the beginning of the construction of the robot. In CAD, the optimization of the parts (shapes, weight, size...) is at the heart of the modeling process.



MACHINING



&

Machining allows us to produce the parts modeled in CAD. To machine the wooden parts of the mechanisms, we use the CNC (numerically controlled machine tool) and the 3D printer for the plastic parts. For the final version of the robot, some parts are made of aluminum, we then call upon the know-how of our sponsors and partners (MAHP, Groupe NOEL ...)

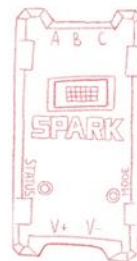
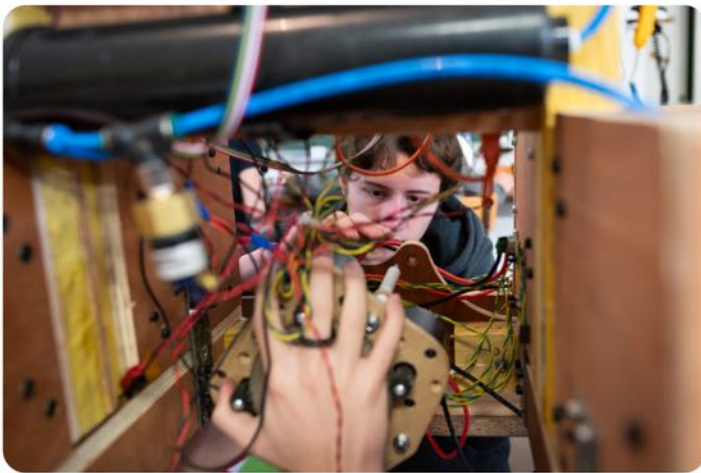
For a mechanism to be optimal, it is necessary to go through several prototypes, therefore several machining and multiple test phases.

PROTOTYPING



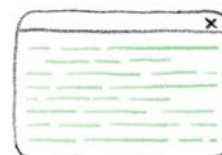
ELECTRONICS & PNEUMATICS

The robot is motorized and programmed. The robot is composed of electrical and pneumatic parts (Arduino, motors, cylinders, wiring, ...) that need to be programmed.



PROGRAMMATION

We use the C++ language to program the robot. Programming allows us to manage the motors of the different mechanisms and integrate the visual recognition. Programming is absolutely necessary in the autonomous period (15 seconds at the beginning of the game).



DRIVING



To drive the robot during competition, we select the best driver and co-driver each year. The Drive team trains on robot n°2 before going to the competition. During the matches, this duo drives the robot so that it performs the different tasks to accomplish on the field as quickly as possible.

STRATEGY & SCOUTING

It consists in reading and understanding the game manual's rules with the whole team, to work together to develop game strategies. But also, to train the drivers to control the robot, to scout by recording data on the designs and performances of other teams' robots, the results of practice rounds, and the games' results. And finally, analyzing the scouting results enables us to develop strategies and select team alliances.



FIELD

We analyze the year's game field and determine the building method. We build the field elements for the robot's training.



COMMUNICATION



The communication team is in charge of managing and organizing internal and external events (presentations, meetings, fairs...). In cooperation with the rest of the team, we talk about Robo'Lyon on social networks (Insta, FB, LK), on our website and via our newsletter.

The communication team informs on the robot's evolution by following and presenting the work of the different technical poles.

We regularly develop and update the website. We are in charge of searching for sponsors and partners in order to raise the necessary funds to build the robot and travel to the competition.



@robolyonoff



Robo'Lyon



Robo'Lyon



www.robolyon.com

It's the whole team's job!

TOOLS



Discord : daily messages/ exchanges



One drive : storage and sharing of files



Nextcloud : storage and sharing of photos and videos



Trello : project management and work organization



Figma : graphism

GRAB**CAD**

GRABCAD : The CAD drive



GITHUB : The programming drive

1. KICK-OFF PROCESS
2. COMPETITION PROCESS
3. AWARDS

04. COMPETITION

KI



**A FIRST® ROBOTICS
COMPETITION** season starts
in January, after the kick-off.
But what is a kick-off?
It is the launch of the year's
game. FIRST® is on Twitch live
with all the teams in the world to
share the rules of the new game.
These rules take two forms: an
explanation video and
a "game manual"

CK-

OFF



COMPETITION

VOCA

- **Game:** Yearly challenge that changes every year
- **Field:** dimensions: 27ft by 57ft

- **Game element :** item of the game of the year with which the robot interacts (ball, cone...)
- **Alliance :** Association of 3 robots. 2 alliances, one blue and one red one red, compete in each match.
- **Match:** A match lasts 2.15 minutes and is divided into 3 phases: autonomous period, teleoperated period and end game.

BUL

POINTS:

- **Points:** are earned by a set of game actions
- **Penalty points:** if one alliance commits a fault, the other alliance gains points
- **Ranking points:** They are used to determine the ranking of the teams during the qualification phase. During each match it's possible to gain up to 4 ranking points.
- **The Blue alliance :** website which gathers all the FIRST teams, the match videos and the different awards won.

ARY

- **Explanatory videos:**
- A video about the game in general
- Several videos on the field and game elements

Game manual is composed of:

- The rules of the competition that never change
- The rules of the game of the year
- The dimensions of a field and of each game element
- The maximum dimensions of our robot

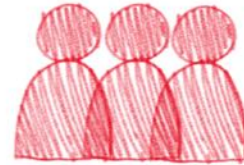
ANALYSIS

1. Viewing of the game video sent by FIRST® (Twitch live)



2. Reading of the game manual sent by FIRST®

3. Summary by group in front of the rest of the team to ensure that everyone has understood the game



4. Determine the possible actions (catch a ball, go to a ball), the cycles of these actions (go to a ball THEN catch a ball THEN throw the ball) and time needed for each action.

5. When everyone has the same vision of the game, we develop a strategy for our robot and decide which mechanisms we want to create.





COMPETITION PROCESS

INSPECTION

To check the robot's conformity

TRAINING

The drivers train on the real field and make possible adjustments

QUALIFICATION

The alliances drawn at random play against each other: about 10 matches.
Ranking given at the end of the matches.

PLAY-OFFS

Alliances formed by the best teams compete to qualify
(quarter-final, semi-final, final)

**WILL GO TO
CHAMPIONSHIP IN HOUSTON**

COMPETITION WINNERS

the first two teams of the Alliance that wins the competition

AWARD WINNERS

the FIRST[®] Impact
or the Engineering Inspiration
Award

COM

In a match, the red alliance and the blue alliance compete against each other. Each alliance is composed of three robots. Each drive team comes to the field with its robot and then stays in the alliance station.

The drive team includes the driver, co-driver, team captain, field technician, and the human player who interacts directly during matches (for example, in 2018, he had to fill chests with cubes given by the robot).

PETI

TION



A match starts with a 15 second autonomous period during which the robots are programmed to start playing and scoring without. This period is followed by a 1:35 teleoperated (robot controlled) period, during which the players try to score as points as possible in order to win the match.

Links of games played by Robo'Lyon in 2022

https://www.thebluealliance.com/match/2022ilch_qm31

https://www.thebluealliance.com/match/2022ilch_qm78

AW

FIRST® Impact.

This is the most prestigious award of the competition. It honors the team that is the best role model for other teams and that incorporates the goals and values of FIRST®.

Students make a presentation in front of judges and hand over a video of approximately 2 minutes. At the Championship, the team who wins the FIRST Impact Award enters the Hall of Fame and is qualified for the championship during 10 years.

Engineering Inspiration Award :

This award recognizes the team that has done the most to spread the knowledge and values of engineering in their community.

AR

Robot, creativity et innovation :

Autonomous Award
Creativity Award
Industrial design Award
Innovation in control Award
Quality Award
Excellence Award

Dean's List :

Rewards a student with outstanding leadership within the team

Team characteristics :

Gracious Professionalism® Award
Team Spirit Award
Sustainability Award
Image Award
Rookie inspiration Award
Juges' Award

®

DS

Rookie All Star Award :

("Rookie Team of the Year Award"). A rookie team is a team competing for the first year. It recognizes the team for its performances, organization and impact on its community.

1. FIRST® COMMUNITY
2. THE BEST TEAMS
3. VERY IMPORTANT PERSONS
4. FIRST® VOCABULARY

05

FIRST®

THE COMMUNITY

The FIRST® community is **WAY MORE** than just a robotics competition.

The FRC is a **PLACE WE MEET** and **EXCHANGE** with other young people passionate about science, technology, engineering and mathematics. The FRC, in particular, **GATHERS** teams from all over the world who **SUPPORT** each other in their pursuit for excellence.

To stay connected to this community, there are many **TOOLS** such as online forums and social networks. Following the most influential teams allows to stay informed of the latest developments and to be aware of upcoming events. It is also an opportunity to connect with other teams and to be inspired by their work.

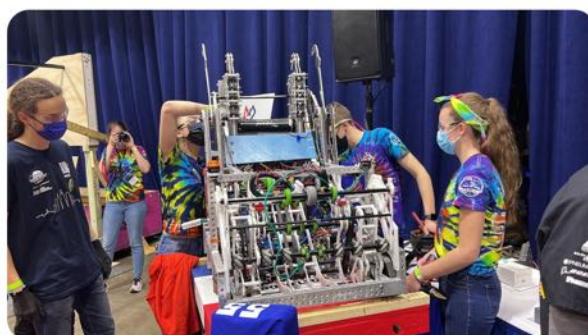
The notion of **EXCHANGE** and **INSPIRATION** is at the heart of the FIRST® community.

Teams willingly **SHARE** their 3D files and other technical information online, allowing everyone to **IMPROVE**.

Regional **MATCHES**, which can be watched live or replayed, as well as **ROBOT REVEALS** are also key moments to discover what's new and how other teams are doing.

The robots reveals are videos published by the teams after the 6 weeks of construction to present their robot : [Robot Reveal 2022 - Home Run 5553](#) | [FRC team 1690 Orbit 2022 robot reveal - "PARKER"](#)

But to truly **GET INTO** the spirit of the FIRST community, it's essential to go to the competitions in person. This is an opportunity to **WATCH** the best teams, to learn more about their organization and way of working, but also to **MEET** the other participants. In this community, the spirit of **COOPERATION** and **HELP** is strong, and this is what makes it so rich and successful.



B E S T TEAMS



TEAM 16 - Bomb Squad
frcteam16.org



TEAM 2767 - Stryke Force
strykeforce.org



TEAM 1114 - Simbotics
simbotics.org



TEAM 1678 - Citrus Circuits
citruscircuits.org



TEAM 217 - ThunderChickens
thunderchickens.org



TEAM 33 - Killer Bees
www.killerbees33.com



TEAM 67 - The HOT Team
www.hotteam67.org



TEAM 254 - The Cheesy Poofs
team254.com



TEAM 148 - Robowranglers
robowranglers148.com



TEAM 359 - Hawaiian Kids
waialuarobotics.com



TEAM 2056 - OP Robotics
2056.ca

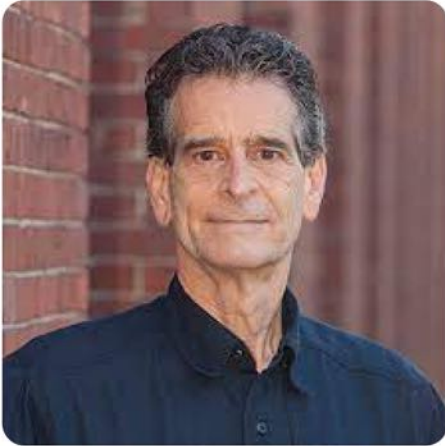
Team 16 - Bomb Squad - Team 33 - Killer Bees - Team 67 - The HOT Team - Team 118 - Robonauts - Team 148 - Robowranglers - Team 217 - ThunderChickens - Team 254 - The Cheesy Poofs - Team 359 - Hawaiian Kids - Team 1114 - Simbotics - Team 1678 - Citrus Circuits - Team 2056 - OP Robotics - Team 2767 - Stryke Force



FIRST

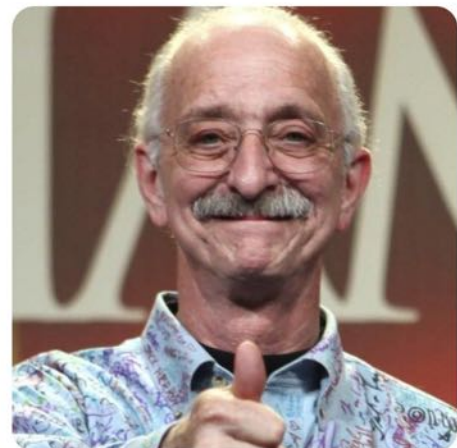


ICONIC FIGURES



Dean Kamen is the founder of FIRST®. He is best known for inventing the Segway and the personal insulin pump. He holds more than 450 patents in various technological fields, including medicine.

Woodie Flowers (died in 2019) is the creator of the FIRST® Robotics Competition. This engineer and MIT professor introduced FIRST® values such as "gracious professionalism" (innovate while respecting others and the rules) and "coopertition" (cooperation + competition).



Chris Moore is the president and chief executive officer (CEO) of FIRST . He joined in 2021, bringing his great experience of leadership and field engagement, as well as a passion for creating programs that serve youth, families and communities.



FIRST

VOCA

Coopertition[®]

Coopertition is based on the concept and philosophy that teams can and should help and cooperate with each other even when they are competing.

Coopertition is about learning from teammates and mentors.

Coopertition means always competing, but helping others when you can.

BULARY

Gracious Professionalism[®]

Gracious professionalism is part of the FIRST[®] philosophy. It is about encouraging quality work, emphasizing the value of others and respect for individuals and the community.

With Gracious Professionalism, fierce competition and mutual gain are not separate concepts.

Kind professionals learn and compete like crazy, but treat each other with respect and kindness in the process. They avoid treating anyone like losers. No tough talk, but no cheesy platitudes either. Knowledge, competition and empathy are subtly blended.

In the long run, gracious professionalism is part of the pursuit of a meaningful life. One can add to society and have the satisfaction of knowing that one has acted with integrity and sensitivity.



LINKS



ROBOLYON.COM



