

# Schedule

9:00 am	Registration	Please sign in on arrival
9:15 am	Dining Hall	Opening Speaker – Shawn Lim (FIRST)
10:00 am	Break	Snacks available or bring your own
10:10 - 11:40am	Morning Workshops	Listed Below
11:40 – 12:40pm	Lunch	Pizza + Drink + Cookie for \$5
12:40 – 2:10pm	Afternoon Workshops	Listed Below
2:15 – 2:30pm	Dining Hall	Prizes and Games
2:30 – 3:15pm	Dining Hall	Closing Speaker – Kim Cooper (FIRST)
3:15 – 4:00pm	Dining Hall	Cake!!

Chairmans/Outreach
Team Management
Other
District
Mechanical/Design
Electrical
Programming
Rookie
Business

Use this colour guide to help plan your day!

Scroll down to see the workshop schedule.

Please note, this year with the number of workshops there are two pages for morning workshops and two for the afternoon workshops.

You can check the time of each workshop as well.

## Morning Workshops

Room	105 (Max. 25 people)	203/204 (Max. 50-60 people)	Learning Commons East	201 (Max. 20 people)	205 (Max. 25 people)
10:10 - 10:50am	Finding the Career of your Dreams – Imagining Your Future After FIRST  Shannon Pole	Introduction to Mechanical Systems  1241  Malavya Shah		Using Software Simulation to Improve Robot Performance  Bonnie Yeu	Writing a Winning Business Plan  771  Jennifer Zhao/ Emily Oliviera
10:50 - 11:00am			Break		
11:00 - 11:40am			Mentor Mingle  771  Thuy Vallance/ Brad Read		

## Morning Workshops Continued

Room	106 (Max. 35 people)	Theater (Max. 100 people)	209 (Max. 35 people)	104 (Max. 25 people)
10:10 - 10:50am	<p>How To Have a Successful Drive Team</p> <p>610</p> <p>Nicholas Oprescu-Havriliuc</p>	<p>District Model FIRST CANADA</p> <p>Shawn Lim</p>	<p>Gracious Expansionism: Growing Your Team</p> <p>910</p> <p>Kevin Swift</p>	<p>Programming for Beginners</p> <p>771</p> <p>Gabriele Martin</p>
10:50 - 11:00am	Break	Break		Break
Room	106 (Max. 35 people)	104 (Max. 25 people)		208 (Max. 35 people)
11:00 - 11:40am	<p>Outreach Action Plan</p> <p>771</p> <p>Kristen Ashworth</p>	<p>Rookie Season 101</p> <p>4814</p> <p>Matt and Minakshi</p>	<p>Introduction to Wiring an Electrical Board Design</p> <p>771</p> <p>Gigi Chan and Vicky Wang</p>	

## Afternoon Workshops

Room	105 (Max. 25 people)	209 (Max. 35 people)	208 (Max. 35 people)	201 (Max. 20 people)	205 (Max. 25 people)	206 (Max. 15 people)
12:40 – 1:20pm	<p>Create a Summer STEM Camp</p> <p>3504</p> <p>Lauren Scheller-Wolf, Sree Mekala and Corinne Hartman</p>	<p>Improve Robot Performance</p> <p>5036</p> <p>Tahmid Seikh, Osaffat Khan and Sohaib Nadeem</p>	<p>LEGO Mindstorm Program at Library</p> <p>3161</p> <p>Roger Balech and Angel Hsieh</p>	<p>Blender – Software to Make Computer Animations of Robots</p> <p>Todd Jahnke</p>	<p>Managing Sponsorship and Finance</p> <p>771</p> <p>Jennifer Zhao and Amanda Adam</p>	<p>FLL Referee Training Session</p> <p>Jeff Laucke</p>
1:20 – 1:30pm	Break	Break	Break			
Room	105 (Max. 25 people)	104 (Max. 25 people)	209 (Max. 35 people)			
1:30 – 2:10pm	<p>The Benefits of Interactive Presentations</p> <p>1360</p> <p>Hakiran Grewal</p>	<p>Machining Strategies</p> <p>1241</p> <p>Corey Lehman</p>	<p>Building a Brand and Image for Your Team</p> <p>910</p> <p>Kevin Swift</p>			

## Afternoon Workshops Continued

Room	203/204 (Max. 50-60 people)	106 (Max. 35 people)	102 (Max. 35 people)	207 (Max. 25 people)	104 (Max. 25 people)
12:40 – 1:20pm	Chairman's Award 771  Marie Jolicoeur-Bécotte and Ayra Kathuria	Making the Most of Competing in a District System  910  Kevin Swift	Tips for Those New to FIRST  1241  Corey Lehman	Developing FIRST in an International School and Connections to China  6162  Caroline Huang, Hector Han, William Neal, Oliver Zhu	Walkthrough of Build Season  610  Charlie Fisher and Walter Raftus
1:20 – 1:30pm		Break	Break		Break
Room		106 (Max. 35 people)	102 (Max 35 people)		208 (Max. 35 people)
1:30 – 2:10pm		How to PID  610  Charles Ju and Maaran Murugathas	Making Your Mark in FIRST as a Rookie Team  6070  Kim Nguyen		Increasing Student Initiative and Independence  4920  Trestan Elsea

# FRC Morning Workshops

## SWATposium 2016

### Finding the Career of your Dreams – Imagining Your Future After FIRST (90 Minutes)

When you think about the future, do you feel doubt and confusion about your path? Do you hear yourself struggling to answer the question – What am I going to do with my life? And you are surrounded by a multitude of options for what you could do. In this presentation the focus will be on WHY you do What you do. By choosing to know and embrace your WHY, the What's will take care of themselves.

**Presenter:** Shannon Pole

Following a degree in engineering, and a few 'lost years' focusing on the What of it all, Shannon continued her learning journey, realised her WHY and became certified in top leadership and results based skills. Shannon now runs an internationally recognized training institute, working with young professionals and students like you who are ready to connect to the career of their dreams and finally answer the question – What are you going to do with your life?

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### Introduction to Mechanical Systems (90 Minutes)

This workshop will cover the basics of mechanical systems used in FRC. These include linkage systems, elevators and intakes. Students will also learn how to effectively

determine the required gear ratio for different FRC scenarios such as drivetrains and arms while learning how to create a basic gearbox.

**Presenter:** Malavya Shah (1241/1285)

**About:** Malavya Shah has been a part of FIRST Robotics since 2007 and attended University of Waterloo for Mechanical Engineering. He is currently the lead mechanical design mentor for Team 1241 and 1285, while also teaching robotics workshops for children in the Toronto Area.

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## Mentor Mingle (40 Minutes)

Take this time to connect with other mentors to share the highs and lows of running a FIRST Robotics team. It's great to connect and get tips to improve your experience, that and there will be hot beverages and treats to lure you in.

**Presenters:** Thuy Vallance and Brad Read (771)

**About:** This is Mrs. Vallance's second year mentoring SWAT 771. She graduated from Engineering Physics and was in the Health and Medical Physics profession before finding her true calling as a teacher. She is passionate about inspiring innovation and creativity in young people. She looks forward to this year's challenge and the new season with the team.

Mr. Read is a current teacher of Physics and Mathematics at St. Mildred's-Lightbourn School (SMLS). He is originally from Ontario, and taught in schools in Scotland, Germany and New Brunswick. He has worked with LEGO Robotics and this is his first year in FRC with SWAT 771. He looks forward to being a mentor to this inspiring and dedicated group.

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## Using Software Simulation to Improve Robot Performance (90 Minutes)

Join this session and learn how physics-based modeling can bring your design to the next level of sophistication. There will be demonstrations on how modeling lets you and your team better understand your system, evaluate between design options as well as predict behavior of a robot, even before prototyping! Bonnie will walk through how commonly used mechanisms and sensors are modeled and then how models can be used for analysis to make design decisions.

**Presenter:** Bonnie Yeu (Maplesoft)

**About:** Bonnie Yeu is a Senior Application Engineer for Maplesoft. Bonnie is a graduate of the University of Waterloo, where she studied Mechanical and Mechatronics Engineering. Bonnie has been with Maplesoft since 2011, where her focus has been on the use of Maple and MapleSim for engineering applications. She has also been a FLL coach and FIRST robotics judge.

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## Writing a Winning Business Plan (90 Minutes)

This workshop will go over the basics of a writing business plan. We will review how to write an effective executive summary, product description and market analysis. Students will also engage in an interactive activity to put their skills to the test. Please bring along your team's business plan, if you have one, so we can better tailor the workshop.

**Presenters:** Jennifer Zhao and Emily Oliviera (771)

**About:** Jen has been a member of SWAT 771's business team for 4 years. She has trained as the junior lead for two years and is now the business lead. She helped write the team's award winning business team, attended sponsorship presentations, and enjoys interacting with potential sponsors.

Emily has been a member of the business team for three years. She has contributed to SWAT 771's business plan, enjoys presenting to sponsors, and likes spending time with the business team.

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## How to Have a Successful Drive Team (40 Minutes)

A successful robotics team is often enabled by a drive team that can operate in unison during difficult situations. This session will teach you how the driver, operator, coach and human player have to think alike and act together for victory.

**Presenter:** Nicholas Oprescu-Havriliuc (610)

**About:** Nicholas has been the operator for Team 610 for two years during all of the regionals and finals for the competition season (Toronto, Hawaii, St. Louis). Nicholas was the driver at the World Robot Conference – 2015 in Beijing China. Throughout this time he got to learn a lot about different drive teams and how to make them successful. He also has experience in the programming, energy systems, and design and manufacturing fields.

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## Outreach Action Plan (40 Minutes)

SWAT, like many FRC teams participates in many outreach activities in a year. This workshop will focus on how to find opportunities, how to prepare and what to do once you get there. There are some great opening questions guaranteed to get others to stop and find out more. We'll share these questions and more.

**Presenter:** Kristen Ashworth (771)

**About:** Kristen has been a member of SWAT for 3 years. She began on the game piece subteam and is now leading the Outreach subteam. She will be presenting with our Chairman's team this year and really gets the importance of outreach.

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## District Model (40 Minutes)

Ontario will be moving to a new format for the FIRST Robotics Competition (FRC) called the District Model. Districts will bring changes to the cost, registration, payment, number/size/duration of events, practice schedule, bagging/ unbagging rules and qualifications method for attending championship events. This workshop will teach you how to optimize your team's budget and its chances for qualifying for the World Championship under the new District Model. Find out what challenges are involved with this transition, and how your team can help FIRST Robotics Canada make the District transition a successful one.

**Presenter:** Shawn Lim (FIRST Canada)

**About:** Mr. Lim is the Director of District Implementation at FIRST Robotics Canada. In 1996, he was a member of the very first Canadian competitive robotics team at Woburn Collegiate Institute, team 188. He and two other Woburn Robotics members founded Flatline Solutions Inc (FSI), a smart-meter data acquisition company; now a part of Quadlogic Meters Canada. In 2006 he was awarded a Woodie Flowers Finalist Award for outstanding robotics mentorship. In 2008, he successfully exited FSI and began a career as a teacher at Runnymede Collegiate Institute where he developed course curriculum integrating robotics into his classroom. He also was a key mentor on Runnymede's FIRST Robotics team 1310. In 2010, Mr. Lim accepted a teaching position at the Crescent School and helped lead 610 to win the FIRST Robotics Competition World Championships.

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## **Rookie Season 101 (40 Minutes)**

Topics covered will include how to market your team, build season strategy, what to expect at a competition and how to achieve the championship qualification criteria – all from the perspective of a rookie team.

**Presenter:** Matt and Minakshi (4814)

**About:** Matt is in his 7th year of FRC and this will be his 3rd year as a member of WE FIRST. He helps with strategy, mechanical, and electrical subsystems. Prior to joining 4814 he was a student on 610, acting as a robot operator in the World Championship winning year for the team.

Minakshi is going into her 4th year of FRC and has been a member of WE FIRST for 3 years. She assists with business strategy and outreach events. Prior to mentoring, Minakshi was a member of 4814.

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## **Gracious Expansionism: Growing Your Team (90 Minutes)**

The Foley Freeze (910) has grown from about 8 students in 2005 to 54 students for 2017. We would like to share with you some of our lessons learned in regards to recruiting new students, managing all of them, and keeping them all engaged. Also learn about organizational structure, balancing mentor/student work load, and developing student leadership skills.

**Presenter:** Kevin Swift (910)

**About:** Kevin Swift is an alumni and mentor of FIRST Team 910 – The Foley Freeze. As the team’s assistant coach, he manages the team’s operations and has seen the team grow from a fledgling group of students to a well-established organization over the last 9 years.

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## **Programming for Beginners (40 Minutes)**

It’s fun to be interested in programming, but it makes life hard if you don’t understand how to read code. This workshop will focus on explaining lingo and syntax in a more relatable way. Along with taking a more hands on and interactive method to learning.

**Presenter:** Gabriele Martin (771)

**About:** Gaby is a 3rd-Year on Swat 771 and is the new programming lead. They have a passion for all things robotics and likes to learn and teach new things. They hope to pursue a degree in mechatronics next year and wants to stay involved in the FIRST community.

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## **Introduction to Wiring and Electrical Board Design (40 Minutes)**

In this interactive workshop, you will learn the basics for wiring your robot and electrical board design. You will be introduced to the electrical board and shown all the aspects. You will then learn to wire the different parts. This includes stripping wires, putting terminals on the ends and connecting them to the talons and the power distribution board. The electrical board design is essential for a successful robot. You will also learn about SWAT 771's way to design a neat and organized electrical board using CAD.

**Presenters:** Gigi Chan and Vicky Wang (771)

**About:** Gigi has been on SWAT for 4 years and is the new electrical lead. She has run a few electrical training sessions within her team and looks forward to help rookie members with electrical.

Vicky is a 4th-year member on the team and is one of the co-captains. She has a lot of mentoring experience and you can see her helping other teams at competitions all the time.

# FRC Afternoon Workshops

## Create a Summer STEM Camp (40 Minutes)

Girls of Steel, FRC 3504, has experience offering 3-day, one-week, and two-week summer robotics camps. Join us at this workshop to learn about creating a camp curriculum that fits your team's ideas and schedule. Running a STEM and robotics camp is a great way to inspire the kids in your community.

**Presenters:** Lauren Scheller-Wolf, Sree Mekala, Corinne Hartman (3504)

**About:** These are experience member of the Girls of Steel team, an all-girls team based in Pittsburgh, Pennsylvania. This successful team has been friends with SWAT since their inception in 2011.

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## The Benefits of Interactive Presentations (40 Minutes)

When presenting to Sponsors, at Robotics conferences or just generally your audience will be happier if you choose an interactive presentation. Find out a variety of ways to add this impact to your presentations.

**Presenter:** Hakiran Grewal (1360)

**About:** Hakiran is a member of Team 1360, Orbit Robotics coming from Holy Name of Mary College School.

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## Improve Robot Performance for Low-Resource and Young Teams (40 Minutes)

In 2014, our rookie year, our team finished 44th of 47 teams after qualifications. Two years later, we made it to the playoffs for the first time and captained an alliance. We'll be talking about the improvements we made to our team and our build season to be able to make that kind of progress in 2 years.

**Presenters:** Tahmid Sheikh and Osaffat Khan and Sohaib Nadeem (5036)

**About:** Tahmid Seikh is the current captain of Team 5036 and lead for design and programming. He joined the team in the 2014-2015 school year.

Osaffat Khan is currently in his first year at UOIT, studying mechatronics engineering. He's a former co-captain and former student lead for electrical and pneumatics. He joined 5036 in 2013-2014.

Sohaib Nadeem is currently in his first year at UOIT, studying mechatronics engineering. He's a former co-captain and former student lead for design and manufacturing. He joined 5036 in 2013-2014.

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## FRC Machining Strategies (40 Minutes)

Team 1241 THEORY6 is fortunate enough to have a very well equipped machine shops with includes Milling Machines, Lathes, CNC Router, CNC Lathe, CNC Milling center. In this session team 1241 will explain strategies used during the build season to quickly manufacture a robot. This is targeted for both beginner teams without a shop space and teams who may want to compare their machining process.

**Presenter:** Corey Lehman (1241)

**About:** Corey Lehman is the robotics/manufacturing teacher at Rick Hansen S.S. and has been involved with FIRST Robotics for the past 4 years.

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## **Creating an Introductory LEGO Mindstorm Robotics Program at Your Local Library (40 Minutes)**

This workshop will feature Team 3161's newest ongoing project at the Oakville Public Library. The presenters will take participants through the process of establishing an educational program at the library as well as the curriculum delivered.

It is recommended that you have a basic knowledge of working with Lego Mindstorm.

**Presenter:** Roger Balech and Angel Hsieh (3161)

**About:** Roger Balech is the lead mentor of team 3161.

Angel Hsieh is a Co-Captain of the FRC team 3161.

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## Making Your Team Great Again: Building a Brand and Image for Your Team (40 Minutes)

Whether your concern is recruiting students and mentors, acquiring sponsorship, or being memorable at a competition, having a recognizable team can benefit your team in many ways. The Foley Freeze has developed an award winning image and would like to share with you the evolution of their brand and tips for developing your own.

**Presenter:** Kevin Swift (910)

**About:** Kevin Swift is an alumni and mentor of FIRST Team 910 -The Foley Freeze. As the team's assistant coach, he manages the team's operations and has seen the team grow from a fledgling group of students to a well-established organization over the last 9 years.

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## Blender – Software to Make Computer Animations of Robots (90 Minutes)

Blender, an open source 3D animation package with built in game engine. Blender can be used to create a model of a robot and then program it with forward and inverse kinematics in order to simulate a learning platform. This simulation can then interact with an external program - see [MORSE](#) - an academic grade simulator for robotics fully based on Blender Game Engine.

**Presenter:** Todd Jahnke

**About:** Todd Jahnke, MDM, Classical & Computer Animation, has had the good fortune to have worked alongside some of the best animators and digital media artists in the world at

studios such as: Walt Disney Feature Animation, Warner Bros., C.O.R.E., etc. As the current Project Consultant for Animation Curriculum at Conestoga College, and former animation professor at Mohawk & Humber Colleges, Todd is passionate about teaching and inspiring a new generation of animators.

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## **Managing Sponsorship and Finance (90 Minutes)**

This workshop will cover the basics of attaining Sponsors and managing the finances for your team. We will cover the basics of branding, marketing and presenting to sponsors. Students will also participate in an interactive business workshop.

**Presenters:** Jennifer Zhao and Amanda Adam (771)

**About:** Jen has been a member of SWAT 771's business team for 4 years. She has trained as the junior lead for two years and is now the business lead. She helped write the team's award winning business plan, attended sponsorship presentations, and enjoys interacting with potential sponsors.

This is Amanda's second year as a member of SWAT 771 and her first year as the Business Jr. Lead. She dedicates her time to both the programming and business sub-teams, and mentors FLL on her spare time. Last year Amanda contributed to the two-time regional winning business plan and helped to promote SWAT to judges at the World Championships.

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## FLL Referee Training Session (90 Minutes)

This is an official training session if you hope to be a referee at an official (or unofficial) FIRST Lego League event this year. FRC team members encouraged.

**Presenter:** Jeff Laucke

**About:** Jeff has been a coach for the Rosedale Royal Thunder FLL team since Ocean Odyssey (2005), the Director of the Sarnia Regional Tournament since Nanoquest (2006), and a referee at the Ontario Championships since Climate Connections (2008). He refereed at the Toronto Open in 2013 and the World Festival in 2015 and 2016 and is now the Head Referee for Ontario.

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## Chairman's Award (90 Minutes)

Confused about the Chairman's Award? Don't know what you'll need to win? Want some first-hand advice from SWAT 771's Chairman's presenters? Then "Chairman's 101" is the workshop for you. We'll cover what you'll need to submit, what to keep in mind when organizing your outreach, walk through every part of the submission process, offer some helpful tips that we've learned and much more! Sign up for a 90 minute in depth workshop today.

**Presenters:** Marie Jolicoeur-Bécotte and Ayra Kathuria (771)

**About:** Marie is part of team SWAT 771. This is her third year on the team. Her first year she was the Robot Room Lead, last year she was the Awards Jr. Lead and a chairman's presenter, and she is now the Awards Lead as well as a chairman's presenter once again.

Now In her fourth year as member of SWAT 771, Ayra Kathuria serves as Co-Captain for her team. Over the course of her FIRST Career she's served as Jr. Award's Lead and Award's Lead, and was recently a semi finalist for the Dean's List Award. As a two time Chairman's Presenter her experience with both the award and the FIRST community is vast, while her passion for the program continues to grow. She'll be one of the Co-Presenters for "The Chairman's Award" at this year's SWATposium, so if you're looking for the first-hand advice be sure to drop in.

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## **Making the Most of Competing in a District System (40 Minutes)**

Being a district team can be a bit different than being a regional-only team. After 8 years of competing in districts, The Foley Freeze would like to share some of our experiences and lessons learned regarding district competition and how it affects your decision making. Topics included will be thinking strategically about your whole season, the pros/cons of building a practice bot, optimizing your un-bag window, choosing which competitions to attend, and competing outside of your district.

**Presenter:** Kevin Swift (910)

**About:** Kevin Swift is an alumni and mentor of FIRST Team 910 -The Foley Freeze. As the team's assistant coach, he manages the team's operations and has seen the team grow from a fledgling group of students to a well-established organization over the last 9 years.

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## How to Program PID (40 Minutes)

Live program a PID (Proportional, Integral and Differential/Derivative) to teach how to code your own PID loops and how to tune them. We are going to program a PID loop line and use the smart dashboard to tune a PID using a drivetrain.

**Presenters:** Charles Ju and Maaran Murugathas (610)

**About:** Charles Ju is a 4th-year member of the team and is the head of Programming. He has programmed the Autonomous for the last two years and worked in the pits at 6 competitions.

Maaran Murugathas is a 3rd-year member of the team. He programmed vision on last year's robot and worked on autonomous.

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## Tips for Those New to FIRST (40 Minutes)

Rookie teams as well as new students on teams will learn what to expect during the course of the year. Topics such as pre-season, build season, competition season and off season will be addressed. This is a great opportunity to ask questions of a FIRST HUB. A timeline will be presented showing opportunities for you and your team to get involved from now until kickoff.

**Presenter:** Corey Lehman (1241)

**About:** Corey Lehman is the robotics/manufacturing teacher at Rick Hansen S.S. and has been involved with FIRST Robotics for the past 4 years.

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## Making Your Mark in FIRST as a Rookie Team (40 Minutes)

With more than 3100 FIRST Robotics teams in the world, and almost 180 teams in Ontario alone, how can a Rookie team successfully enter the world of FIRST Robotics? Join Team 6070: Gryphon Machine as they take you through the chronicles of their successful 2016 Rookie season. Featuring activities and audience interactions, the members of Team 6070 will be sharing all the lessons, secrets, tips and tricks they learned as they grew to make their own mark in the FIRST Robotics Competition.

**Presenter:** Kim Nguyen (6070)

**About:** Kim has been a Gryphon Machine Student Member since the 2016 FIRST Season and the 2017 Captain of Marketing

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## Developing FIRST in an International School and Connections to China (90 Minutes)

- Team 6162 networking with other FRC teams in China in June, 2016
- Development of leadership structures in the London International Academy (LIA) STEM/FRC program
- Development of students' skills in the LIA STEM/FRC program
- Development of the STEM Program at LIA and its relation to FRC

**Presenters:** Caroline Huang, Hector Han, William Neal, Oliver Zhu (6162)

**About:** Caroline Huang - Leader, CAP Alpaca, Team 6162: Caroline, from Beijing, China was appointed by the previous year's team as the student leader for the 2016-2017 school year. So far, Caroline has the team off to a great start, having managed the selection of a new name and logo for the team and divided the team into six operating group. Originally from Beijing, China, Caroline hopes to study either Engineering or Business at one of McGill, Waterloo, Queens or UBC.

Hector Han - Minister of Mechanics, Cap Alpaca, Team 6162: Hector Han, from Chengdu, Sichuan, was selected by the students of the previous year to be a team leader for the 2016-2017 FRC season. Hector coordinates the efforts of the Mechanics sub-group of the Cap Alpaca FRC team. Hector was a participant in the 2016 First Stronghold competition in Windsor Ontario and wishes to study Aviation Management at Western University.

William Neal - Lead Mentor, Cap Alpaca, Team 6162: William Neal is the Director of STEM at London International Academy and lead mentor of the Cap Alpaca FRC team. William is passionate about unlocking vast amounts of unrealized talent in students and teachers through an ongoing exploration of the frontiers of education.

Oliver Zhu, mentor, Cap Alpaca, Team 6162: Oliver initiated LIA's FRC team in November, 2015 right around the registration deadline. Through a determined and persistent effort, Oliver seems to have willed the team into existence and launched it onto its current trajectory having successfully guided the team through its first competition along the way. After one year working in the LIA STEM program, Oliver provided professional development workshops to teachers in China for three weeks in June, 2016.

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## Walkthrough of Building Season (40 Minutes)

A timeline of 610's Design and Manufacturing (D&M) side of the build season, and a breakdown of the things we do, deadlines we try to meet, and the things we believe would be very beneficial for other teams to incorporate.

**Presenters:** Charlie Fisher and Walter Raftus (610)

**About:** Charlie has been a member of Design and Manufacturing of Team 610 for 2 years, and was their human player last year. He was involved in the design of the landing gear for last year's robot, Scorpion. He is looking forward to another year on Team 610.

This will be Walter's fourth and final year on team 610. He has been on design and manufacturing for his entire time on the team, and is a current Co-Head of the division, and was an Assistant Head last year. He led the small team responsible for creating 610s hanger for the 2016 season.

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## Increasing Student Initiative and Independent Responsibility (40 Minutes)

In this workshop, we will explore different methods to encourage student leadership and initiative, so a team's work and responsibility can be distributed more efficiently among its members.

**Presenters:** Trestan Elsea (4920)

**About:** Trestan Elsea is a grade 12 student, and team 4920's media department head, as well as communications director. In the future, he hopes to become an engineer as they have a positive impact on the world.