

## 2022 FTER STEM SummerCamp

**Robotics / Python / Java / Tech&Communication / Scratch**

May 23 - Aug 26 (Total 14 weeks) Online via ZOOM

## Robotics 机器人

Grade Group 分班	Time (EST)	Days	Weeks	Course Title 课程	Tuition 学费
Beginner 9 yrs. +	16:30 ~ 18:00	T Th*	4	G4 + (5/23 ~ 6/17)	\$300 / 15+10 hrs / 4 weeks
Beginner2 9 yrs. +	16:30 ~ 18:00	T Th	5	G4 + (6/20 ~ 7/22)	\$300 / 15+10 hrs / 5weeks
Beginner3 9 yrs. +	16:30 ~ 18:00	M W	5	G4 + (7/25 ~ 8/26)	\$300 / 15+10 hrs / 5 weeks
Advanced	16:30 ~ 18:00	M W	5	G4 + (6/20 ~ 7/22)	\$300 / 15+10 hrs / 5weeks
Advanced2	16:30 ~ 18:00	T Th	5	G4 + (7/25 ~ 8/26)	\$300 / 15+10 hrs / 5weeks

\*Will add 2 additional classes based on students availability; \*\* \$30 license for 1 year. No programming experience required for beginner. 1.5 hours per class, 2 hours discord support time per week

## Python Programming 编程

Grade Group 分班	Time (EST)	Days	Weeks	Course Title 课程	Tuition 学费
Beginner 9 yrs. +	16:30 ~ 18:00	M W*	4	G4 + (5/23 ~ 6/17)	\$300 / 15+10 hrs / 4 weeks
Beginner2 9 yrs. +	16:30 ~ 18:00	M W	5	G4 + (6/20 ~ 7/22)	\$300 / 15+10 hrs / 5weeks
Beginner3 9 yrs. +	16:30 ~ 18:00	T Th	5	G4 + (7/25 ~ 8/26)	\$300 / 15+10 hrs / 5 weeks
Advanced	16:30 ~ 18:00	T Th	5	G4 + (6/20 ~ 7/22)	\$300 / 15+10 hrs / 5weeks
Advanced2	16:30 ~ 18:00	M W	5	G4 + (7/25 ~ 8/26)	\$300 / 15+10 hrs / 5weeks
Project	19:00-20:30	M W	5	G4 + (6/20 ~ 7/22)	\$300 / 15+10 hrs / 5weeks
Project2	19:00-20:30	M W	5	G4 + (7/25 ~ 8/26)	\$300 / 15+10 hrs / 5weeks

\*\* No programming experience required for beginner. 1.5 hours per class, 2 hours discord support time per week

## Java Programming 编程

Grade Group 分班	Time (EST)	Days	Weeks	Course Title 课程	Tuition 学费
Beginner 11 yrs. +	19:00 ~ 20:30	T Th	5	G6 + (6/20 ~ 7/22)	\$300 / 15+10 hrs / 5 weeks
Beginner 11 yrs. +	19:00 ~ 20:30	T Th	5	G6 + (7/25 ~ 8/26)	\$300 / 15+10 hrs / 5 weeks
Project	19:00-20:30	M W	5	G6 + (6/20 ~ 7/22)	\$300 / 15+10 hrs / 5weeks
Project2	19:00-20:30	M W	5	G6 + (7/25 ~ 8/26)	\$300 / 15+10 hrs / 5weeks

\*\* No programming experience required for beginner, 1.5 hours per class, 2 hours discord support time per week

## Tech &amp; Communication

Grade Group 分班	Time (EST)	Days	Weeks	Course Title 课程	Tuition 学费
T&C 10 yrs. +	19:00 ~ 20:30	M W*	4	G5 + (5/23 ~ 6/17)	\$300 / 15+10 hrs / 5 weeks
T&C2 10 yrs. +	19:00 ~ 20:30	M W	5	G5 + (6/20 ~ 7/22)	\$300 / 15+10 hrs / 5 weeks
T&C3 10 yrs. +	19:00 ~ 20:30	M W	5	G5 + (7/25 ~ 8/26)	\$300 / 15+10 hrs / 5 weeks

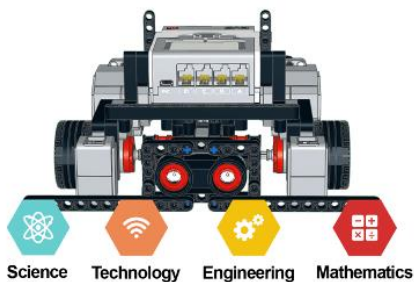
\*\* No programming experience is required, 1.5 hours per class, 2 hours discord support time per week

## Scratch

Grade Group 分班	Time (EST)	Days	Weeks	Course Title 课程	Tuition 学费
Jr 6 yrs. +	19:00 ~ 20:00	T Th*	4	G1 + (5/23 ~ 6/17)	\$220 / 10+10 hrs / 4weeks
Jr2 6 yrs. +	19:00 ~ 20:00	T Th	5	G1 + (6/20 ~ 7/22)	\$220 / 10+10 hrs / 5 weeks
Jr3 6 yrs. +	19:00 ~ 20:00	T Th	5	G1 + (7/25 ~ 8/26)	\$220 / 10+10 hrs / 5 weeks

\*\* No programming experience is required, 1 hours per class, 2 hours discord support time per week

## Robotics Class



This class gives kids the opportunity to learn the fundamentals of robotics, including the logic and programming knowledge required to design and develop solutions to real-world problems. Students use simulation software to control a virtual EV3 robot, incorporating different type of sensors and robot attachments to create fun programs.

**Beginner:** Over the course of 10 weeks, student will learn about loops and various sensors, including Ultrasonic and Color. Using simulation software, they will programmer virtual robots to complete certain tasks, like using the color sensor to stay inside a marked black square... Also they will apply what they learn to design and program robots for a sumo competition as last project.

**Advanced:** Students will learn more advanced programming and new sensors, including Compass and Infrared, to create more complex and powerful programs. Students will combine their knowledge of variables and programming logic operations to complete challenges from the World Robotics Olympiad and design programs to have robots compete in fully autonomous soccer matches.

- 1.5 hour/class, 10 hours discord support. \$300/10 classes/5 weeks, \$30 license for one year
- 9 yrs. old +, No programming experience required for beginner

## 课程简介

本课程为孩子们提供了学习机器人技术基础的机会，包括设计和开发针对实际问题的解决方案所需的逻辑和编程知识。学生使用仿真软件来控制虚拟 EV3 机器人，并结合不同类型的传感器和机器人附件来创建有趣的程序。

**初级班:** 在 10 周的课程中，学生将学习线圈和各种传感器，包括超声波和彩色传感器。他们将使用仿真软件对虚拟机器人进行编程，以完成某些任务，例如使用颜色传感器将其留在标记为黑色的方块内。最后作业为机器人相扑比赛，将学到的知识应用到机器人的设计和编程中。

**进阶班:** 学生将学习更多高级编程和包括 Compass 和 Infrared 在内的新传感器，来创建更复杂，功能更强大的程序。结合运用变量和编程逻辑运算的知识，完成世界机器人奥林匹克竞赛的挑战，设计程序以使机器人参加全自动足球比赛。

- 1.5 小时 / 次，10 小时 discord 在线解答，\$300 / 10 次课 / 5 周，\$30 一年的软件许可证
- 九岁以上，初级班无需任何编程经验



## Python Class

**Python** is one of the most powerful, yet simple programming languages used today. Is used across various industries in all sorts of applications, ranging from web development to data science. It uses simple syntax that makes it beginner-friendly, making it a great choice for a first programming language.

**Beginner:** In this course, we will introduce the basic concepts behind not only Python but programming in general. We will start by introducing basic data structures and then move into control structures and loop structures before learning simple graphics. By the end of this course, students will be able to apply and utilize the concepts taught within this course to create simple game. This will prepare students for many more advanced courses in computer science taught in high schools and colleges.

**Advanced:** Python Advanced is an intermediate level course building off of what students learned in Python Beginner. Python is used in many fields, from training AI to developing web applications. Students will learn to use the many powerful Python libraries that are used in professional and scientific settings. This course will introduce new concepts such as web development, advanced algorithms, and machine learning using decision trees. This develops their skills to the next level, bringing them closer to meeting the standards of professional Python programmers.

- 1.5 hour/per class, 10 hours discord support, \$300/10 classes/5 weeks
- 9 yrs. old +, No programming experience required for beginner

## 课程简介

Python 是当今使用功能强大，同时也是最简单的编程语言之一。从 Web 开发到数据科学，涉足各个行业，各项应用中均得到广泛的使用。它以其简洁、易读、易学、易维护及强大的可扩展性，深受初学者的喜爱，从而成为学习编程语言的首选。

**初级班:** 我们不仅引导学生了解基础编程，还会深入 Python 背后的基本概念。从介绍基本数据结构开始，在学习简单图形之前，引领孩子掌握控制结构和循环结构。课程结束时，学生即可运用课程中学到的概念来创建简单的游戏，为孩子们在今后的计算机科学学习中面临的更多挑战做好准备。

**进阶班:** 作为一门中级课程，以从初级班中学到的内容为基础。从 AI 培训到 Web 开发各项应用程序，Python 已广泛运用于许多领域。学生将学习如何利用功能强大的 Python 资源，解决实际问题，从而运用在各自的专业和科学项目之中。本课程还将介绍新概念，例如 Web 开发，高级算法和机器学习中的决策树训练。提升技能至更高的台阶，引领孩子更接近或更能满足专业 Python 程序员的标准。

- 1.5 小时 / 次，10 小时 discord 在线解答, \$300 / 10 次课 / 5 周
- 九岁以上，初级班无需任何编程经验



## Python Project

**Python** is one of the most powerful, yet simple programming languages used today. Is used across various industries in all sorts of applications, ranging from web development to data science. It uses simple syntax that makes it beginner-friendly, making it a great choice for a first programming language.

**Project:** This project-based course focuses on developing students' computer science problem-solving skills. As one of the most popular computing languages, Python has tons of packages of pre-made code called libraries or add-ons, making it one of the most versatile languages while remaining easy to learn. Project class provides students an opportunity to become familiar with a few of these packages such as the time module for time-related needs, turtle for simple graphics, and pygame for more complex graphics and animation. Through the creation of games like a speed typing tester and nostalgic arcade games like Pong and Galaga, students not only master these packages, but they also deepen their understanding of Python and develop essential problem-solving skills not just vital for computer science. It builds on core Python knowledge by introducing program planning to students, thus providing greater training in how to use and apply basic concepts to the creation of algorithms for more complex problems. For this course, basic Python experience is expected with a solid understanding of core concepts ranging from variables and loops, up to functions and classes.

- 1.5 hour/per class, 10 hours discord support, \$300/10 classes/5 weeks
- 11 yrs. old +, Python programming knowledge and experience required

## 课程简介

Python 是当今使用功能强大，同时也是最简单的编程语言之一。从 Web 开发到数据科学，涉足各个行业，各项应用中均得到广泛的使用。它以其简洁、易读、易学、易维护及强大的可扩展性，深受初学者的喜爱，从而成为学习编程语言的首选。

**项目班:** 本课程通过多个不同的项目开发来培养学生在面临实际应用时的综合能力，作为最流行的编程语言之一，Python 丰富的标准库和强大的可扩展性使得它的应用性非常广泛。课程通过数个标准库件的运用，不但熟练掌握库件，更主要的目的是让学生可以灵活应用所学到的知识在多个实际项目中，并且开始独立调试程序。标准库件包括时间库，图像，游戏等。需要学生已经具备 Python 的基本知识，熟悉 Python 编程语言的核心概念和结构，包括变量，逻辑和控制语句，类等，帮助学生通过学习完成从项目需求到独立设计，编程，调试的全过程。

- 1.5 小时 / 次，10 小时 discord 在线解答, \$300 / 10 次课 / 5 周
- 十一岁以上，需要具备 Python 的基本知识和有编程经验



## Java Class

**Java** is a High Level, class-based, object-oriented programming language that is designed to have as few implementation dependencies as possible. It is a general-purpose programming language intended to let application developers write once, run anywhere, meaning that

compiled Java code can run on all platforms that support Java without the need for recompilation, currently more than 3 billion devices run Java. it is used for: Mobile applications (Specially Android apps), Desktop applications, Web applications, Web servers and application servers, Games, Database connection... As Java is close to C++ and C#, it makes it easy for programmers to switch to Java or vice versa.

**Beginner:** In this course, we will cover core programming concepts and structures using the Java programming language. Key concepts that students will learn include loops and logic control statements, with a focus on real-world applications and critical thinking; students will have opportunities to apply their knowledge in a final project they choose, such as making a Discord chat bot or game. We will also discuss the fundamentals of class-based, object-oriented programming and how it compares to other coding languages such as Python. This course does not require any previous coding experience and aims to provide a solid foundation for more advanced high school- and college-level courses.

- 1.5 hour/per class, 10 hours discord support, \$300/10 classes/5 weeks
- 11 yrs. old +, No programming experience required for beginner

## 课程简介

Java 是一种面向对象的高级编程语言，具有功能强大和简单易的特征。Java 可运行于多个平台，允许程序开发人员编写一次即可在任何地方运行，即已编译的 Java 代码可以在支持 Java 的所有平台上运行而无需重新编译。目前有 30 亿个设备在运行 Java，Java 可以编写多种应用程序。

**初级班:** 我们将介绍使用 Java 编程语言的核心概念和结构，包括逻辑和控制语句，重点放在实际应用程序的使用上；学生可以将所学到的知识应用到现实案例中。课程结束时，将指导学生完成一个最终项目，例如创建游戏或聊天机器人。本课程不需要任何以前的编码经验，旨在为高中和大学水平的课程提供坚实的基础。

- 1.5 小时 / 次，10 小时 discord 在线解答, \$300 / 10 次课 / 5 周
- 十一岁以上，初级班无需任何编程经验





## Java Project

Java is a High Level, class-based, object-oriented programming language that is designed to have as few implementation dependencies as possible. It is a general-purpose programming language intended to let application developers write once, run anywhere, meaning that compiled Java code can run on all

platforms that support Java without the need for recompilation, currently more than 3 billion devices run Java. it is used for: Mobile applications (Specially Android apps), Desktop applications, Web applications, Web servers and application servers, Games, Database connection... As Java is close to C++ and C#, it makes it easy for programmers to switch to Java or vice versa.

**Project:** This course will be mostly focused on Java projects, with minor reviewing or teaching of content where necessary. Students will have the opportunity to extensively practice programming concepts through activities like writing graphics- and text-based games, deepening their understanding of Java in the process. Most importantly, by flexibly applying their knowledge in different contexts, students learn critical problem-solving skills that aren't just relevant for Java. For this course, some Java coding experience is expected, with a solid understanding of core concepts ranging from variables, and loops, up to methods, classes, and basic inheritance.

- 1.5 hour/per class, 10 hours discord support, \$300/10 classes/5 weeks
- 11 yrs. old +, Java programming knowledge and experience required

## 课程简介

Java 是一种面向对象的高级编程语言，具有功能强大和简单易的特征。Java 可运行于多个平台，允许程序开发人员编写一次即可在任何地方运行，即已编译的 Java 代码可以在支持 Java 的所有平台上运行而无需重新编译。目前有 30 亿个设备在运行 Java，Java 可以编写多种应用程序。

**项目班:** 本课程是基于 Java 语言的多个项目开发，在布置项目任务时会根据需求做简短的不同知识要点的回顾和总结。学生有机会可以接触到多个不同领域的项目开发，例如：基于文本命令处理和图像设计的游戏软件等，主要的目的是培养学生可以灵活应用所学到的知识在多个实际项目中，并且开始独立调试程序。需要学生已经具备 Java 的基本知识，熟悉 Java 编程语言的核心概念和结构，包括逻辑和控制语句，类和继承等，旨在帮助学生通过学习完成从项目需求到独立设计，编程，调试的全过程。

- 1.5 小时 / 次，10 小时 discord 在线解答, \$300 / 10 次课 / 5 周
- 十一岁以上，需要具备 Java 的基本知识和有编程经验

## Tech & Communication Class

Communication goes hand in hand with developing technology, where teamwork and collaboration are crucial, yet it is a skill that is often overlooked. In this course, students will learn how to articulate their STEM ideas confidently and present it to an audience. Unlike other public speaking classes, this course focuses on communication, and the creation of products, rather than just the presentation of them. Students will be able to improve their current skills while also having plenty of opportunities to practice. These versatile communication techniques that students will learn can be applied to all aspects of life, from creating a presentation in school or submitting a proposal in the workplace to even improving day to day interactions.

**T&C:** Tech and Communication will be a unique course that integrates STEM or technology as communication content by covering skills like how to speak and what to say, allowing students to articulate their STEM ideas confidently. Topics will include effective research, creating a presentation, speaking techniques, as well as question and answering. This class will culminate in a mock competition and includes workshops for students to receive feedback. As a course on communication with a focus on technology, it will target a variety of students, but is primarily aimed for those who already have basic experience with STEM.

- 1.5 hour/per class, 10 hours discord support, \$300/10 classes/5 weeks
- 10 yrs. old +, need basic experience with STEM

### 课程简介

现代社会越来越注重团队协作，沟通交流务必与技术发展齐头并进。然而这项技能经常被人们忽视，在本课程中，学生将学习如何自信地表达自己的科技观点，以及如何将自己的理念展现给观众。与普通的演讲辩论的不同之处，该课程侧重于创作和交流。学生将通过大量的实际练习来提高他们个人的技能。而这种沟通交流技能将有益于学生实际生活的各个方面，包括目前在学校及将来在工作中创作演讲文稿，提交提案，并提高日常沟通技巧。

**科技与沟通艺术:** 有别于公众演讲和辩论，这是一门独俱一格的课程，将技术交流作为交流内容，引导学生展现科技发展以及如何沟通和演讲，让学生自信地表达他们的技术研究课题。课程主题包括有效的研究和创作演讲文稿，演讲技巧以及处理问答环节，进行模拟比赛，然后举行研讨会。

- 1.5 小时 / 次，10 小时 discord 在线解答，\$300 / 10 次课 / 5 周
- 十岁以上，具备一定的 STEM 基本知识



## Scratch Class

**Scratch** is the world's largest coding community for young children. It provides a visual programming language with a simple and intuitive interface that allows young people to create digital stories, games, and animations. Scratch promotes computational thinking and problem-solving skills, creative teaching and learning, self-expression and collaboration, and equity in computing. Scratch is always free and is available in more than 70 languages.

**Scratch Jr:** In this course, ScratchJr is an introductory programming language that enables young children (ages 6-8) to create interactive stories and games. Children piece together graphical programming blocks to make characters move, jump, dance, and sing. Designed to be an introductory programming language to Scratch.mit.edu, ScratchJr serves as a fantastic foundation of computational skills for younger children. ScratchJr is available as a free app for both iPad and Android tablets.

- 1 hour/per class, 10 hours discord support, \$220/10 classes/5 weeks
- 6 yrs. old +, No programming experience required for beginner

## 课程简介

Scratch 让初学者不需要先学习语言和语法便能设计程序，通过学习制作过程中，启发和激励同学培养独立思考和解决问题的能力。经由操作（如设计数字故事、游戏、动画）去理解学习程式设计、数学和计算知识，同时获得创造性的思考，逻辑编程，和协同工作的体验。Scratch 目前支持超过 70 多种语言。

**Scratch Jr:** 本课程是帮助 6-8 岁的同学开始学习初步逻辑编程，设计互动故事和游戏。学生可以通过拖曳预先设定好的积木式程序模件，堆叠出各种指令例如：移动，跳跃，跳舞和唱歌等动作，设置或控制角色及背景的行动和变化，从而通过功能封装的方式简化了编程学习并完成程序设计。

- 1 小时 / 次，10 小时 discord 在线解答, \$220 / 10 次课 / 5 周
- 六岁以上，无需任何编程经验





## 主讲团队 **FTER**

**(Foundation for Technological Education and Research)**

**机器人冠军队 FTC11697 Tech-tonic** 队伍自 2016 创立以来，每次出场比赛都拿到 FTC 自动驾驶的最佳奖，18/19 赛季在近 200 支 FTC 参赛队伍中勇夺新州锦标赛冠军，19-20, 20-21, 21-22 赛季都是首批直接晋级州锦标赛，受疫情影响，后续比赛被迫取消或压缩。软件团队根据几年的实战经验，自疫情开始就自编教材独家开设网上机器人班，学生覆盖新州、宾州、纽约、明尼苏达、俄亥俄州、麻省和加州等，广受粉丝好评！

2020 年春季开始推出 **STEM** 系列课程并成立 **FTER** 机构，为了培养学生的实际编程能力，除了传授相应的电脑知识外，每门课中特意安排数个实战项目并指导学生独立完成。成立二年来，到目前合计推出 43 期（1000 小时以上的网上教学），学生目前覆盖全美 15 州。

2021 年 9 月 **FTER** 组织机器人班的学生参加了 **WRO** 年度机器人锦标赛，这也是同学们第一次亮相美国和世界竞技舞台。来自 NJ、OH、NY 的 13 位学生组成 5 支团队参赛，5 支团队全部晋级并代表美国参加 10 月份的 **WRO** 世界锦标赛，其中 12 位学生获得满分 100 分。本年度美国共出线 9 支团队，**FTER** 代表队包揽了一半席位。全球有 15 个国家 740 支以上的队伍参加各国角逐，仅有 200 支队伍从各国出线进入到世界锦标赛。在 90 支世界锦标赛决赛队伍中，**FTER** 5 支团队分别取得位列 28、38、47、60 和 66 名的较好成绩。

这是支由近三十位高中/大学生/研究生组成的 **STEM** 团队，课程包括机器人初级/进阶班/年度比赛训练营，Python 初级/进阶班/项目班，Java 初级班/项目班，科技与沟通艺术，Scratch 等。

## 部分主讲老师

- Michael S.** – Former FTC team 11697 President & software lead, certified Java programmer, Python programmer, NYU Stern BTE Freshman
- Leon W.** - FTC team 11697 President & programmer, EBHS Senior
- Charles J.** - has EV3 experience with RobotCorps, Python/Java programmer, Pingry HS Junior
- Patrick Z.** - FTC team 11697 Vice President & programmer, HPHS Junior
- Richard Z.** - Experienced with Java and Python, BRHS Senior (UPenn class 2026 Math)
- Sean Z.** - Proficient in Python and Java, Purdue Computer Science Freshman
- Larry L.** - Web developer (John Hopkins University course), Lua, and Python. Rutgers Prep Sophomore
- Stanley C.** - Proficient in Python, Java and Octave, CMU Junior (Math + CS)
- Alex X.** - Excellent in Python, Java. CMU Junior (Python Class teacher Associate, Computer Science)
- Rachel A.** - Proficient in Java and Python, MIT Computer Science Freshman
- Edison W.** - Experienced with Java and Python, EBHS Senior
- Frank Z.** - Excellent with Java and Python, USC Graduate Computer Science
- Forest S.** - Excellent with Python/C++ on Machine Learning, MATLAB & Java, Graduated From Boston University with Master Degree in Robotics Major
- Elizabeth J.** - has EV3 and Java experience, Montgomery HS Junior
- Avery C.** – Winner & finalist of Debate Tournament, years public speaking experience, EBHS Junior
- Melinda X.** - Model Congress, Won best debater at regionals, Forensics team, Pingry Freshman