



# TAE coding 2018 SUMMER SCHEDULE

Technology Applied Education

5400 Trabuco #100 | Irvine, CA 92620 | 949-445-1118 | master@taecoding.com

## 2018 SUMMER SESSION 1

### 9<sup>TH</sup> AND UPS SESSION 1 [6/12-7/12, 5 WEEKS]

Course	Grade	Time	Location	Days	Tuition
[CS61] Intro to Data Science	9 <sup>th</sup> & Up	TU, TH 6:00 - 9:00 PM	5400 Trabuco	6/12, 6/14, 6/19, 6/21, 6/26, 6/28, 7/3, 7/5, 7/10, 7/12	\$790

### 7<sup>TH</sup> AND UPS SESSION1 [6/9-7/14, 6 WEEKS]

Course	Grade	Time	Location	Days	Tuition
[CS21] Introduction to Programming in Python	7 <sup>th</sup> & Up	SAT 12:00 - 3:00 PM	5400 Trabuco	6/9, 6/16, 6/23, 6/30, 7/7, 7/14	\$500
[CS22] Programming Fundamentals in Python	7 <sup>th</sup> & Up	SAT 3:00 - 6:00 PM	5400 Trabuco	6/9, 6/16, 6/23, 6/30, 7/7, 7/14	\$500
[CS31] Web Animation and Game Development	7 <sup>th</sup> & Up	SUN 12:00 - 3:00 PM	5400 Trabuco	6/10, 6/17, 6/24, 7/1, 7/8, 7/15	\$500
Office Hour		SAT 11:00 - 1:00 PM	5400 Trabuco		

### 4<sup>TH</sup> – 6<sup>TH</sup> SESSION1 [6/18-7/20 4 WEEKS]

Course	Grade	Time	Location	Days	Tuition
[CS11] Introduction to Programming in Scratch	4 <sup>th</sup> & 6 <sup>th</sup>	MWF 1:00 - 3:00 (PM)	5400 Trabuco	12 lessons: 6/18, 6/20, 6/22, 6/25, 6/27 6/29, 7/9, 7/11, 7/13, 7/16, 7/18, 7/20	\$600
[CS11] Introduction to Programming in Scratch	4 <sup>th</sup> & 6 <sup>th</sup>	MWF 3:00 - 5:00 (PM)	5400 Trabuco	12 lessons: 6/18, 6/20, 6/22, 6/25, 6/27 6/29, 7/9, 7/11, 7/13, 7/16, 7/18, 7/20	\$600

\*\*\* No classes on the week of July 4, 2018

# 2018 SUMMER SESSION 2

## 7<sup>TH</sup> AND UPS SESSION2 [7/21-8/26, 6 WEEKS]

Course	Grade	Time	Location	Days	Tuition
<b>[CS21]</b> Introduction to Programming in Python	7 <sup>th</sup> & Up	SAT 12:00 - 3:00 PM	5400 Trabuco	7/21, 7/28, 8/4, 8/11, 8/18, 8/25	\$500
<b>[CS22]</b> Programming Fundamentals in Python	7 <sup>th</sup> & Up	SAT 3:00 - 6:00 PM	5400 Trabuco	7/21, 7/28, 8/4, 8/11, 8/18, 8/25	\$500
<b>[CS31]</b> Web Animation and Game Development	7 <sup>th</sup> & Up	SUN 12:00 - 3:00 PM	5400 Trabuco	7/22, 7/29, 8/5, 8/12, 8/19, 8/26	\$500
<b>[CS32]</b> Web Design and Development	7 <sup>th</sup> & Up	SUN 3:00 - 6:00 PM	5400 Trabuco	7/22, 7/29, 8/5, 8/12, 8/19, 8/26	\$500
<b>[CS51]</b> Competition Programming	7 <sup>th</sup> & Up	SAT 9:00 - 12:00 AM	5400 Trabuco	7/21, 7/28, 8/4, 8/11, 8/18, 8/25	\$500
Office Hour		SAT 11:00 - 1:00 PM	5400 Trabuco		

## 4<sup>TH</sup> – 6<sup>TH</sup> SESSION2 [7/23-8/17 4 WEEKS]

Course	Grade	Time	Location	Days	Tuition
<b>[CS11]</b> Introduction to Programming in Scratch	4 <sup>th</sup> & 6 <sup>th</sup>	MWF 1:00 - 3:00 (PM)	5400 Trabuco	12 sessions: 7/23, 7/25, 7/27, 7/30, 8/1, 8/3, 8/6, 8/8, 8/10, 8/13, 8/15, 8/17	\$600
<b>[CS11]</b> Introduction to Programming in Scratch	4 <sup>th</sup> & 6 <sup>th</sup>	MWF 3:00 - 5:00 (PM)	5400 Trabuco	12 sessions: 7/23, 7/25, 7/27, 7/30, 8/1, 8/3, 8/6, 8/8, 8/10, 8/13, 8/15, 8/17	\$600



# Why Early Coding Education is important?

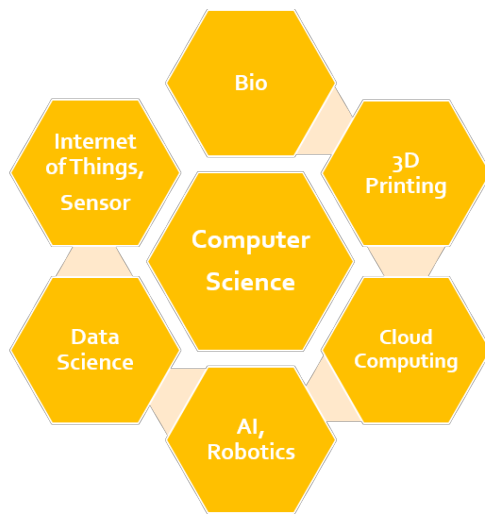
Taehee Jung is a vice president and senior developer at PIMCO, focused on client-facing technologies. Prior to joining PIMCO in 2010, he was with 20th Century FOX as a senior consultant, and National Bankers Group Inc as a computer information system director. In addition, he has many years of experience in teaching various computer science courses for undergraduate and master students at private institutes. He received an undergraduate and master degree in computer science from the University of Southern California. He has 20 years of professional and educational experience, holds an Oracle Certified Java Developer, and a Chartered Financial Analyst (CFA).

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## I. Industrial Revolution and Trend

### The 4th Industrial Revolution

A new era of the 4th Industrial Revolution is imminent. It refers to the integration of advanced information technologies, such as Artificial Intelligence(AI), Internet of Things(IoT), Cloud Computing, Big Data into technologies in existing industries, which will bring about innovative changes to all aspects of society. In other words, all things will be connected by networks, all actions will be recorded as data, and AI with self-learning capability will make important decisions based on accumulated Big Data. Such advancement will inevitably lead to elimination or replacement of current workforce with AI, all the while increasing the desperate need for competent professionals in advanced information technologies. We are already witnessing this "future" in the case of self-driving automobiles and unmanned shops.



## Integration of Computer Science (CS + X)

We can also see that Computer Science(CS) is being integrated with other disciplines. Google calls these transdisciplinary trends as "CS + X," where "X" can be anything. For example, animation could be "CS + art," and smart lenses could be "CS + medicine." In addition, many universities are offering "CS + X" degrees in order to enable their students to innovate in this time of change. Stanford University has been offering "Joint Major" degree in CS and a number of humanities disciplines since 2014. With this kind of convergence, computer science with the software technology will be indispensable knowledge regardless of occupations and fields.

## Early Coding Education Trend

The world has recognized the necessity of early coding education for young children so that the children will not only stay abreast of changes but also lead and affect these changes themselves. Currently, many countries are implementing early coding education. England mandated coding classes for all children between the ages of 5 and 16, and South Korea enforced mandatory coding education in middle school and high school curriculum. In the United States, President Obama started a nationwide campaign called "Hour of Code" to interest children in computer science. Mark Zuckerberg, Facebook founder and Bill Gates, Microsoft founder provided free tutorials for this "Hour of Code" campaign.

## II. What do you teach in coding?

### Fundamentals of Programming Language

Early coding education teaches children the "fundamental concepts of programming language." Coding refers to making commands using a programming language so that the computer can execute. Just like human languages, there are many

programming languages, such as low-level languages called machine languages as well as high-level languages like C ++, Java, Python, and Scratch. By using programming languages with the most similarity to human languages and good visual expressions, proper early coding education should teach the fundamental concepts of language in a fun and effective way, so that children can easily learn any language in the future.

## **Computational Thinking**

Early coding education also teaches children "Computational Thinking." Computational thinking refers to the thinking process of identifying problems and finding solutions so that computer can execute the commands efficiently. Algorithm is the formalization of this process. With various algorithmic problems, proper early coding education should teach children to naturally understand the computational thinking process.

### **III. What can you learn by coding?**

#### **Logical Problem Solving Skills**

Children can learn "Logical Problem Solving Skills" through various algorithm training. In other words, children can learn how to logically solve a large and difficult problem by dividing them into small problems and sequentially solving them. This is very helpful for math, science, and logical writing.

#### **Creative Thinking Skills**

Children can also learn "Creative Thinking Skills" by making various computer application programs. In other words, children can learn creative ways of thinking by developing what they only imagined via use of websites, mobile apps, animations, and games. This is very helpful in art, creative writing, and various project preparation. Furthermore, Children can experience a sense of accomplishment and a boost in self-esteem from sharing their creations with family and friends.

### **IV. How can we learn coding?**

#### **The First Programming Language**

One of the most common questions parents ask is what kind of programming language children should

learn first. I would recommend Scratch, a block coding platform developed by MIT for elementary school students. It is a great tool to build a foundation in programming language, especially for those students with weaker mathematical skills and typing skills. As for middle school and high school students, I would recommend Python, which has excellent visual expression and high applicability in many fields.

## **Websites / Mobile Apps / Games**

All areas of society require computer applications. I would recommend learning how to develop websites, mobile apps, animations, and games. Children will acquire an ability to realize what is needed in real life creatively and moreover, by providing their own capabilities to meet the needs of the communities, they will be able to create many opportunities for the future.

## **Computing Olympiad / Coding Contest**

USA Computing Olympiad (USACO) and middle/high school coding contests presented by colleges require resolution of various levels of algorithmic problems. Especially, many university research centers and industry-leading companies, such as Facebook, Amazon and Google also pose interview questions based on algorithmic issues. I would recommend participating various coding contest. Children will develop an ability to logically solve more complex problems in the real world and, furthermore with the achievement, they will be able to seize more opportunities in the future.

### **V. Conclusion**

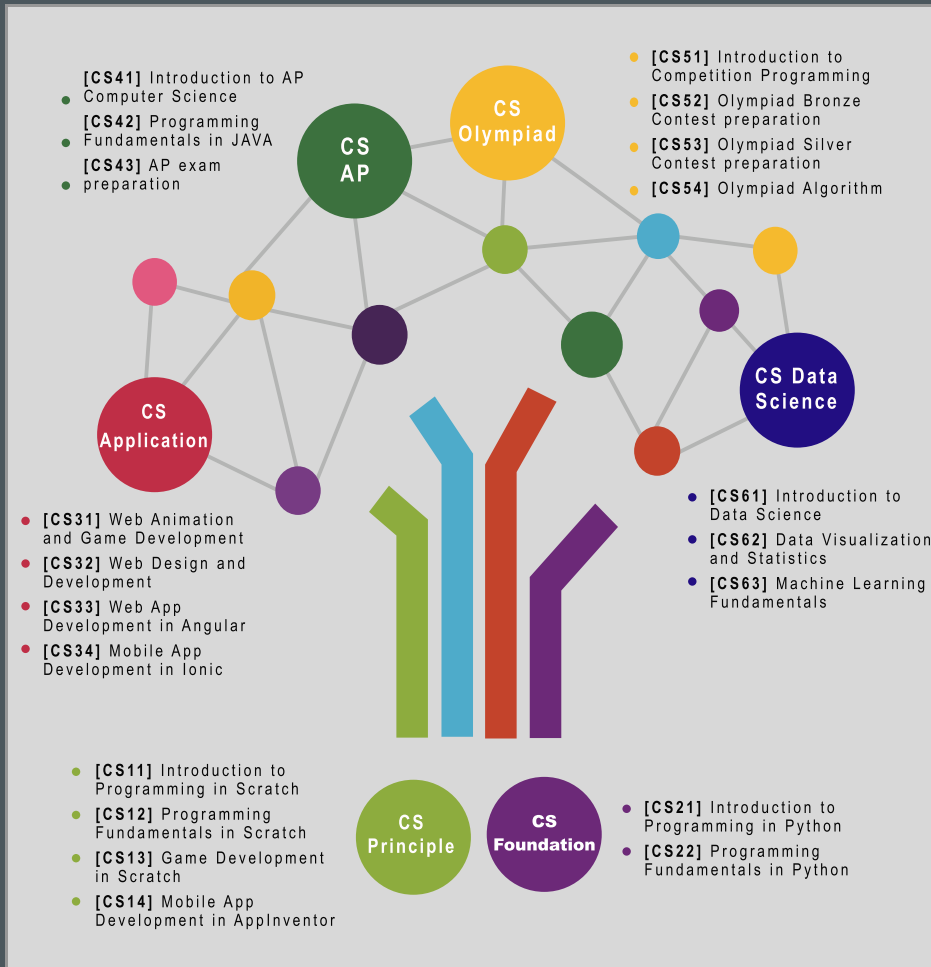
In 2017, over 200 million students around the world learned coding, and over 90% of US parents wished to include coding in the school curriculum. In this age, coding should be a core subject to learn, just like math and reading. In this time of great change, I hope that our children become logical and creative leaders in any field through proper early coding education.







## TAE Coding Tracks



## 2017-2018 Session USA Computing Olympiad

### TAE Coding Achievement

#### Gold / Silver Winners

Jaden Lee	Sage Hill High	9th
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#### Bronze Winners

Jeremy Koo	University High	12th
Jae Hwan Lee	Northwood High	11th
Kangyeon Lee	University High	11th
Junha Kim	Troy High	9th
Justin Chung	Northwood High	9th
YoonSeong Roh	Irvine High	9th
Jaden Lee	Sage Hill High	9th
Andrew Chung	Sierra Vista Mid	8th
Minseo Kim	Pioneer Middle	8th
Shaun Baek	Jeffrey Trail Mid	8th

"Everyone should learn to program."

- Steve Jobs -



## EARLY CODING EDUCATION



Research  
Projects

# DATA SCIENCE MACHINE LEARNING

**HIGH SCHOOL and COLLEGE students**

learn Data Science and Machine Learning  
with university professor and professional analyst.



**Data Scientist:  
The Sexiest Job of  
the 21st Century**

**CS61**

**Intro to Data Science**

**CS62**

**Data Visualization and  
Statistics**

**CS63**

**Machine Learning  
Fundamentals**

**CS64**

**Machine Learning  
Research Project**



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A new era of the 4th Industrial Revolution is imminent. We are already witnessing advancements in technology, such as artificial intelligence, the Internet of Things(IoT) and Big Data rapidly changing every aspect of our society. Preparing our children for these unprecedented changes is critical and imperative.

We at TAE Coding believe that learning coding is as important as learning to read and write for today's students. Through programming education, the students will develop logical thinking and creative algorithmic problem-solving skills. Quality coding education can empower them to be creative leaders in any field in this new era of change.

TAE Coding is a specialist in early coding education. We have designed various learning tracks to accommodate and foster different interests and goals. Each track provides a streamlined guide for our students to learn not only the fundamentals but also advanced programming through systematic curriculum.

## TRACKS OFFERED

### CS PRINCIPLE TRACK [GRADES: 4<sup>TH</sup> – 6<sup>TH</sup>]

- **[CS11]** Introduction to Programming in Scratch
- **[CS12]** Programming Fundamentals in Scratch
- **[CS13]** Game Development in Scratch
- **[CS14]** Mobile App Development in App Inventor

### CS FOUNDATION TRACK [GRADES: 7<sup>TH</sup> AND UP]

- **[CS21]** Introduction to Programming in Python
- **[CS22]** Programming Fundamentals in Python

### CS APPLICATION TRACK [GRADES: 7<sup>TH</sup> AND UP]

- **[CS31]** Web Animation and Game Development
- **[CS32]** Web Design and Development
- **[CS33]** Web App Development in Angular
- **[CS34]** Mobile App Development in Ionic

### CS AP TRACK [GRADES: 7<sup>TH</sup> AND UP]

- **[CS41]** Introduction to AP Computer Science
- **[CS42]** Programming Fundamentals in JAVA
- **[CS43]** AP Exam Preparation

### CS OLYMPIAD TRACK [GRADES: 7<sup>TH</sup> AND UP]

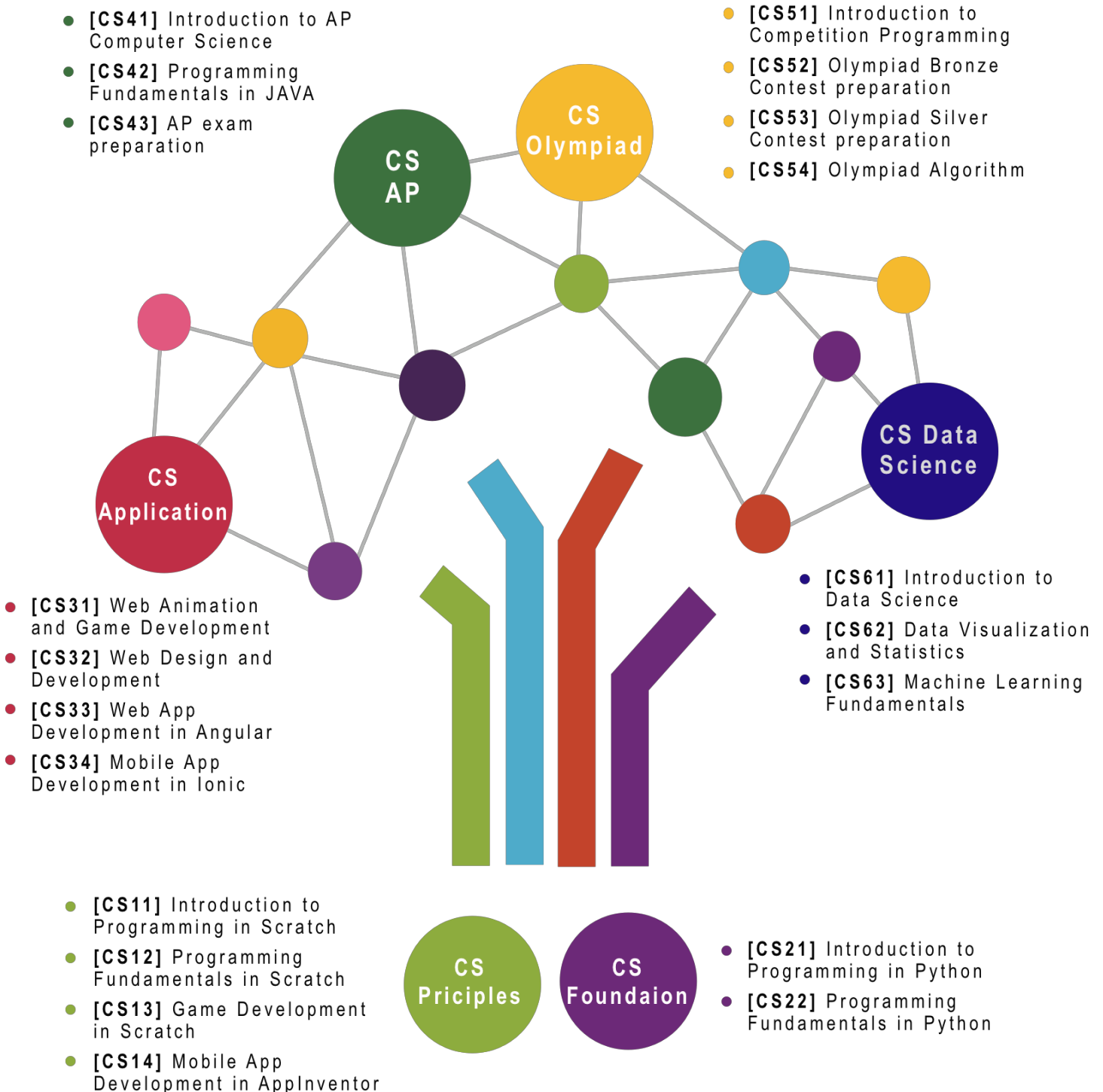
- **[CS51]** Introduction to Competition Programming
- **[CS52]** Olympiad Bronze Contest Preparation
- **[CS53]** Olympiad Silver Contest Preparation
- **[CS54]** Olympiad Algorithm

### CS DATA SCIENCE TRACK [GRADES: 7<sup>TH</sup> AND UP]

- **[CS61]** Introduction to Data Science
- **[CS62]** Data Visualization and Statistics
- **[CS63]** Machine Learning Fundamentals



## COURSE TRACK TREE







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In this Computer Science Principle Track, students will learn essential concepts for programming principles by learning Scratch and App Inventor. Both Scratch and App Inventor are block-based programming languages developed by MIT. Scratch and App Inventor are visually powerful to facilitate the learning of complex programming principles. Students will also learn how to create interactive data-oriented animations and games and how to share their creations with others. By the end of this track, students will have a strong foundation for programming principle and logical computational thinking to move on to more advanced tracks.

**Length:** 4 Courses

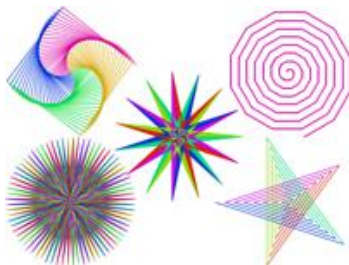
**Recommended Grades:** 4<sup>th</sup> – 6<sup>th</sup>

**Prerequisites:** None



## [CS11] INTRODUCTION TO PROGRAMMING IN SCRATCH

This is the first course in Computer Science Principle Track. Students will learn essential programming concepts, such as variables, operators, expressions, conditional statements, loops, and functions. Also, students will learn how to create basic interactive animations and games. Quizzes and homework will be assigned on a weekly basis.



## [CS12] PROGRAMMING FUNDAMENTALS IN SCRATCH

This is the second course in Computer Science Principle Track. On top of the essential programming concepts, students will learn more advanced programming concepts, such as string, list manipulation, and recursions. Also, students will learn how to create more advanced data-oriented animations and games. Quizzes and homework will be assigned on a weekly basis.



## [CS13] GAME DEVELOPMENT IN SCRATCH

This is the third course in Computer Science Principle Track. With all the programming concepts, students will focus on developing more complicated and interactive games. Also, students will learn how to publish and share their creations with others in the world. By working through projects, students will also learn the basic life cycle of computer science. Quizzes and homework will be assigned on a weekly basis.



## [CS14] MOBILE APP DEVELOPMENT IN APP INVENTOR

This is the last course in Computer Science Principle Track. Students will learn the essential constructs of App Inventor and how to design and develop functional mobile apps for smartphones and tablets. Quizzes and homework will be assigned on a weekly basis.



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In this Computer Science Foundation Track, students will learn essential concepts for programming principles by using Python. Python is an expressive programming language to facilitate the learning of complex programming principles and, also a popular versatile language even suitable for data science. By the end of this track, students will have a strong foundation of programming principles and logical computational thinking to move on to learn how to develop the advanced applications.

**Length:** 2 Courses

**Recommended Grades:** 7<sup>th</sup> and up

**Prerequisites:** None



## **[CS21] INTRODUCTION TO PROGRAMMING IN PYTHON**

This is the first course in Computer Science Foundation Track. By learning Python programming, students will learn essential programming concepts, such as variables, constants, operators, expressions, conditional statements, loops, and functions. Quizzes and homework will be assigned on a weekly basis.



## **[CS22] PROGRAMMING FUNDAMENTALS IN PYTHON**

This is the second course in Computer Science Foundation Track. Students will learn string, list, range sequences, the power of list iteration, string and list methods. Also, students will learn the data structures and other practical tasks of Python programming. Quizzes and homework will be assigned on a weekly basis.



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In this Computer Science Application Track, students will learn how to develop the advanced applications for desktop, web and mobile with the latest industry standard technologies and tools, including JavaScript, HTML5 and CSS, VSCODE IDEA, Typescript, Angular, Ionic and Node.js. By working through fun projects, students will also learn the core software development principles. More importantly, they will learn the common structures in applications and how to apply them to learn new technologies more quickly. By the end of this track, students will have a strong foundation of developing applications and move on to more advanced applications.

**Length: 4 Courses**

**Recommended Grades: 7<sup>th</sup> and up**

**Prerequisites: CS Foundation Track**



## [CS31] WEB ANIMATION AND GAME DEVELOPMENT

This is the first course in Computer Science Application Track. Students will learn the constructs of JavaScript programming and how to build animations, interactive art and games in Typescript. Also, students will learn how to publish websites with animations and interactive games. Quizzes and homework will be assigned on a weekly basis.



## [CS32] WEB DESIGN AND DEVELOPMENT

This is the second course in Computer Science Application Track. Students will learn the constructs of HTML5 and CSS for web designing and styling. Students will also learn how to integrate CSS and JavaScript to give a professional look and feel. Quizzes and homework will be assigned on a weekly basis.



## [CS33] WEB APP DEVELOPMENT IN ANGULAR

This is the third course in Computer Science Application Track. Students will learn Google Angular framework, which is the latest application development technology. By learning Angular framework, student will be able to build applications suitable for all platforms, such as web, mobile web, native mobile, and native desktop. Quizzes and homework will be assigned on a weekly basis.



## [CS34] MOBILE APP DEVELOPMENT IN IONIC

This is the fourth course in Computer Science Application Track. Students will learn Ionic 2, one of the most popular open source frameworks especially for building mobile applications. Students will learn how to develop their own mobile applications and how to publish it. Quizzes and homework will be assigned on a weekly basis.