FINANCIAL MARKETS SIMULATION CENTRES

PROGRAM CODE: AESPA01

Smart Programming and Its Applications
-Building Robotics with Arduino

Highlights

- Learn to program one of the most widely used microcontroller Arduino and its huge and growing ecosystem of sensors and parts.
- Be introduced to the principles of electronics and prototyping tools.
- Understand and utilize the immersed community of Arduino projects from self-driving cars to flying drones and robots
- Prototype your ideas for real-world applications and meaningful projects
- Take home the hands-on projects we build in the program
- Take away an Arduino and myriads of parts and sensors to continue self-development at home
- Need only bring your personal (Windows) laptop or MacBook to start the program
- Experience working with other platforms like Raspberry Pi 3 microprocessors
- Hands-on sessions with seasoned electronics and programming instructors

Program Duration
4 Days, 9:00am to 5:00pm

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Program Background

This program is designed to introduce programming and coding techniques to anyone from thinking kids to developing adults and beyond. Learn Arduino, Scratch, Python, AppInventor and Raspberry Pi etc.

We believe that coding involves the training of the mind to solving complex problems. It helps a person break down complex problems into multiple simpler problems that are solvable, and that the computational thinking skills gained can be applied into many areas in life.

Our immersive style of facilitation and our dedication to sharing makes this a must attend program to learn about smart programming and its applications. We would be working hard together and in turn we will also be having fun together too!

In recent years, there is an unprecedented level of importance attached to the ability to code and create useful real-world applications. Computational thinking has become a subject of increasing international awareness. Earlier this year, the U.S. President endorsed mandatory computer programming education in schools and many countries in the world are also making programming an essential and compulsory subject in school curriculums.

Here are a few reasons why learning programming and hardware is important:

1. Programming is basic literacy in the digital age.

Our reliance on technology will only increase. The students of today must be able to not only actively consume this technology but also to understand and control it, becoming an active part of this huge digital shift.

2. Programming can change the world.

For the last several centuries, people relied on the written word to spread ideas. The ability to write was the ability to create change. Today, writing alone is not enough. To change behavior, it is crucial to leverage the digital and AI medium to automate

3. "You have an idea for the next big innovation? Great! Can you bring it to life?"

Everyone has ideas. Only a select few can make them happen. The ability to code and create separates those who merely have an idea from those who can make their ideas a reality.

4. Programming and hardware don't have to be hard to learn.

Learning how to program and create is like learning any other skills in that it must be practiced and tested out. With just a computer, we can use our programming and hardware skills to build things that could help the world.

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If you aren't learning how to create, now's the time to start!

Program Content

- **An Overview of Arduino**
- **The World of Arduino and Parts**
- **Dancing Light with LED**
- **Ecosystem of Sensors**
- **Detecting Light, Temperature and Humidity**
- **Detecting Motion**
- **Obstacle Detection with Ultrasonic Distance Sensor**
- **Following Line using Infrared Line Sensor**
- **Switching On/Off Applications and Anything in Between**
- **Taking Input from a Keypad**
- **LCD Output**
- **LED Display**
- **Using a Relay**
- **Servo Motor**
- **Wireless Communication using WiFi and BLE**
- **IoT Logging**
- **Building Robots**

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Who should attend?

The Smart Programming and Its Applications - Building Robotics with Arduino Explorer Program is designed to develop thinkers, it is meant for

- Hobbyist to prototype their ideas
- Students to learn programming and electronics
- Teachers to craft meaningful projects for students
- Innovators to make their ideas into reality

This program is suitable for secondary school students, tertiary students and teachers. And it is also suitable for any adult with a penchant to learn and be immersed in the latest technological advances.

Alpha Guide(s)

Mr Tan Wee Siong, a Mathematician and Information Technologist by training, is a Business Domain Expert Facilitator with The Alpha Explorer Program.

Wee Siong earned his Bachelor of Science degree majoring in Mathematics from the National University of Singapore and a Master of Business degree specializing in Information Technology from Curtin University of Technology, Australia. He also holds a Graduate Diploma in Financial Management from the Singapore Institute of Management.

Wee Siong has more than two decades of multi-faceted experience in Information Technology and its applications. He has been involved in software development in the mainframe applications for many years in banks and American MNCs where he was responsible for the design and implementation of banking systems and global B2B e-commerce to meet new business requirements.

Besides being involved in Web Programming and Applications, Internet of Things (IoT), he also contributed to the education of the next generation of Information Technology practitioners in many education institutions.

In addition to the above, Wee Siong has been covering the Asia Pacific region for businesses and has also contributed to the education of the next generation of Information Technology practitioners as an undergraduate supervisor with the Singapore Institute of Management.

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Mr Hew Ka Kian comes with a solid training in the workplace dealing with electronics and programming since graduating from Nanyang Technological University.

His interests in creating things have seen him dabbling in AI like Genetic Algorithm, hardware like Raspberry Pi and Arduino and making apps for Android and iOS app.

Another aspect of Ka Kian is his belief and passion in sharing the joy and knowledge in programming and electronics with like-minded people.