Introduction

HKSAR government recently announced a $50 billion budget for the development of new technologies, including Artificial Intelligence, FinTech and Smart City. A series of summer courses is developed for nurturing our young talents.

Offered by: e-Learning Development Laboratory, the Department of Electrical and Electronic Engineering

Course designer: Dr. Wilton Fok, Director, e-Learning Development Laboratory, a Faculty Best Teacher Awardee and University Outstanding Teaching Awardee

Enquiry: e-mail: elearning@eee.hku.hk / Tel: 2219-4282.

Type of Programme: Non-credit-bearing course

Area of Interest: Engineering, Science, Technology, Computer Studies

Medium of Instruction: Cantonese with supplementary in English

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Course 1: Smart STEM for the Smart City

Course Code: ELRN1801
Difficulty level: ★★

Smart city technology is acknowledged to be the driving force of the urban development and changes. The advocacy of the technologies and concepts of “Smart City” has enabled further development on “Smart Living”, “Smart Mobility”, “Smart Transportation” and “Smart People” which are some of the new directions for the STEM activities for schools and youngsters.

Course Objectives:
The course provides young people with all-rounded tastings of the wide range of Smart City technologies, facilitating their learning with both theoretical concepts and practical skills for nurturing them to be the future smart talents for the smart city. Participants are expected to:

1. Understand and adopt technology for achieving smart people, smart living and smart mobility;
2. Learn logical and computational thinking while using different types of software and technology tools (i.e. Microbit, Arduino, Aurasma, Data Analysis tool) to achieve certain targets.
3. Design and innovate their own experiments and smart tools individually and in group.

Course Contents:
1. **Designing Smart application for Smart People and Smart Living** - Learn how to apply IFTTT (IF This Then That) to implement a smart home so as to turn on home devices intelligently. You will learn how to turn your home into a smart home by yourself.

2. **Developing your Smart Transportation for Smart Mobility** - Learn to develop a smart city with driverless vehicle, autonomy driving with the use of an Arduino controlled model car; learn to use BBC Microbit to program a smart traffic lights for controlling the lighting sequence and with the use of sensors.
3. **Develop Augmented Reality (AR) for Smart Living and Learning** - AR software Aurasma.com and other technologies will be introduced to the participants to build their own multimedia AR application, e.g. to play a video or display the image and text, when a mobile device scan on the corresponding historical image.

4. **Technological business and entrepreneurship skill training** – participants will be trained to innovate a new tech start up with the concept of technologies learnt the course.

5. **Technical visit to the Cyberport/Science Park** – A visit to the base of technology incubation will be arranged to widen the participant exposure and understanding of the high tech career.

6. **Inspiration sharing by successful talent** – successful young talent such as the “Son of Star”, Young ICT Achiever Awardee and Winner of the Gold Award National Internet+ Competition will be invited to give sharing to the participants in two sessions to inspire the participants on their career and future development pathway.

**Take away package:** Each participant will be provided with a file of course materials, a BBC Microbit hardware and a development tools CDROM.

![Image]

**Level-of-study:** Students promoting to S1-S3 in Sept 2018

**Date:** July 23-27, 2018 (Mon to Fri)

**Time:** 9:30 – 12:30, 13:30 – 16:30 (lunch break* 12:30-13:30)

* Participants can enjoy their lunch time with their own option of canteens. For young participants, escort service during the lunch hour can be provided upon the request by the parents.

**Venue:** HKU Main Campus at Pokfulam

**Instructors:** Dr. Wilton Fok and teachers with the Chief Executive's Award for Teaching Excellence

**Course Fee:** HK$6,000

**Deadline for Application:** May 31, 2018

**Area of Interest:** Urban Development, Smart City, Engineering, Science, Technology
Course 2: Robotic Technologies

**Course Code:** ELRN1802
**Difficulty level:** ★★★

**Course Description:**
Coding and computation think is the new core knowledge for our next generation. Robots may become our colleagues in the future workspace and we should learn how to communicate with them. More and more educators are looking to add coding and electronics to their maker education programs. Arduino is one of the most common open source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor or a finger on a button - and turn it into an output such as starting a motor and turning on an LED. In fact, the Arduino has incorporated into learning and teaching and enhances students’ learning effectiveness. It could be used as the brain of a robot. This course aims to facilitate participants to learn the knowledge on using Arduino and programming for the implementation of our own robot and gaming devices.

**Course Objectives**
- To learn using Arduino programming
- To gain design skill and practical hands-on engineering experience for robotic design
- To inspire creativity and innovation

**Course contents**

**Technical skills**
- Basic operation and application of Arduino
- Input/output microcontroller
- Hands-on practice for LED, buzzer, and servo control
- Run a serial program for program debug
- Design procedure of making a program
- Design flow from idea to actual programming and debugging
- Hands-on software programming of a joystick and making a robot arm
- Design a program to control the servo through serial port
- Robot arm construction and programming

**Managerial and soft skills**
- Rule of thumb of product design
- Analyze the possibility and difficulty of their project
- Project time management
- Creative thinking

**Other activities**
- Robotic competition
- Visit to The Advance Robotic Lab in HKU /Science and Technology Lab

**Course Period:** July 16, 2018 to July 20, 2018 (Mon to Fri)
* Participants can enjoy their lunch time with their own option of canteens. For young participants, escort service during the lunch hour can be provided upon the request by the parents

Course Fee: HK$6,500 (including material fee)

Take away package: Each participant will be provided with a file of course materials, a Robotic arm development kit and a development tools CDROM.

Students: Local S2-S5

Medium of Instruction: Cantonese with supplementary in English

Level-of-study: S1-S3
Each student will have one Internet accessible Window based computer with USB. Admin right is required to install the Arduino program.

Deadline for Application: May 31, 2018

Area of Interest: Engineering, Science, Technology, Computer Studies
Course 3: Future Artificial Intelligence and FinTech

Course Code: ELRN1803
Difficulty level: ★★★

Course Objectives:
FinTech is a hot topic and is rapidly developing in the global financial centre like Hong Kong. With the use of advance technology such as algorithm trading, mobile payment, cryptocurrency, artificial intelligence, the landscape of the financial industry is changing and new skills and talents are demanded. On the other hand, Artificial Intelligence is another fast growing area. AI can be applied in many areas such as pattern recognition, security, fraud detection, stock market prediction etc. The course objectives are as follows:

1. To introduce the latest technologies on FinTech and Artificial Intelligence
2. To appreciate the application of Artificial Intelligence in different areas
3. To inspire the innovation and entrepreneurship sense of the learners

Course contents

1. Managing financial big data
2. Technical Analysis & Algorithm Trading
3. Cyber security & Mobile payment Technologies
4. Introduction of Artificial Intelligence engine TensorFlow
5. Using TensorFlow for pattern recognition and financial applications
6. FinTech Entrepreneurial project
7. Sharing by FinTech practitioners / MBA graduate of the University of Cambridge
8. Technical visit to the FinTech Centre in the Cyberport/ HK Stock Exchange Connect Hall/ HK Monetary Authority Information Centre

Level-of-study: students promoting to S3-S6
Date: Jul 30, 2018 to August 3, 2018 (Mon to Fri)
* Participants can enjoy their lunch time with their own option of canteens. For young participants, escort service during the lunch hour can be provided upon the request by the parents.
Venue: HKU Main Campus at Pokfulam
Course Fee: HK$7,500
Area of Interest: Engineering, Science, Technology, Computer Studies, Business, Accounting and Finance