CAMPUS **PARIS EIFFEL**

SUMMER **CERTIFICATE PROGRAM**

ECE PARIS
GRADUATE SCHOOL OF ENGINEERING

SMART OBJECTS

Certificate awarded by: ECE Paris: Graduate School of Engineering
Welcome event: Monday June 30th, 2014 **Start date:** Monday June 30th, 2014 **End date:** Thursday July 24th, 2014
Total ECTS: 9 **Total contact hours:** 72
Program requirement: a minimum 18 years of age
Program location: ECE Paris - Campus Eiffel I, 10 Rue Sextius Michel, 75015 Paris
Language of instruction: English

PROGRAM FEE: 1,850€

FEE INCLUDES:

- Orientation/Welcome Event
- Weekly cultural visits/activities
- Computer accounts at the school (WIFI access)
- Access to the school's MediaCenter
- Official transcript of grades
- Program Certificate
- Certificate Ceremony

PROGRAM OVERVIEW/OBJECTIVE:

"Everything that can benefit from a connection will have one. As people we are already online. The next step is to get things and places online. And we are moving fast in that direction. The vision of more than 50 billion connected devices by 2020 may seem ambitious today, but with the right approach, it is within reach."[1]

Take any object around you, a fork, a key ring, a lock, a bottle, a shoe, a golf club, a dog collar or even a baby diaper and imagine its new role if this object, associated to sensors, was able to communicate. Your fork could tell you that you are eating too fast, your golf club could help you improve your gesture, and your baby's diaper could tell you when it is wet… Connected to your smartphone and to the Web, the smart object can become a coach, analyze facts and figures, make statistics, share your achievements on social networks and gather data that can become a source of value once made anonymous and merged on a population level.

This trend is highly represented amongst French actors of the industry. We can name Parrot with their Flower Power that gives voice to your houseplant, Withings and their Smart Body Analyzer, HapiFork by HapiLabs, Netamo and their thermostat, plus a number of other startups and established companies…

At the same time, modular platforms such as Arduino or Raspberry Pi have given access to an easy way of prototyping to a large community of innovators. The development of a demonstrator is no longer restricted to R&D teams but has become accessible to a new generation of "makers". With its VPE[2] program, ECE Paris has developed an expertise in coaching innovative projects in particular in the field of connected devices. With easy to use prototyping environments, students can quickly go from the idea to the proof of concept. The purpose of this Summer School program is to initiate students to the environment of smart objects together with a "Do It Yourself" experience.

The session is based around a project and split in three parts:

- Device: the sensors, the wireless communication technology, the prototyping modules…
- Mobile: mobile phone operating systems, Android framework, application development…
- Web: what is LAMP? Environment setup, basic PHP, application development…

This 72 hour program will mostly take place in labs. If successfully validated, it will give access to a certificate counting for 9 ECTS.

CONTACT summer@pariseiffel.fr

[1] Ericsson white paper 284 23-3149 Uen | February 2011
[2] Valorisation des Projets des Elèves (Student project valorization)

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PROGRAM COURSE LIST

Course Title	ECTS (credits)	Contact hours	Level (undergraduate or graduate)
Device	**9**	**7 sessions of 3h 9:30-12:30 July 1st to July 10th**	**undergraduate**
Mobile		**7 sessions of 3h 13:15-16:15 July 1st to July 10th**	**undergraduate**
Web		**7 sessions of 3h 9:30-12:30 July 15th to July 24th**	**undergraduate**
Project		**Free access to labs 13:15-16:15 July 15th to July 24th**	

COURSE 1

Course Title	*The connected device*
Learning outcomes	Be able to prototype an embedded system that includes a sensor and a wireless communication standard using dedicated modules and platforms.
Pre-requisites	C programming, basic knowledge of microcontroller architectures.

COURSE CONTENT:

What is a smart device? What are the common architectures? How to make a quick prototype of an original concept using standard modules?

The goal of this course is to answer these questions first through a presentation of the following topics:

- Sensors
- Radio networks such as Bluetooth Low Energy, 6LowPan / Zigbee…
- Microcontrollers, development kits and standard modules

Secondly, an application is chosen and students will prototype their own system starting from the connected device to its mobile application and web interface.

SMART OBJECTS

COURSE 2

Course Title	*Android Development*
Learning outcomes	Be able to build your own Android applications
Pre-requisites	Java Development
Recommended readings	*Java in a Nusthell*, by David Flanagan *Seven Languages in Seven Weeks*, by Bruce A. Tate

COURSE CONTENT:

Learn how to program your own Android applications: with some knowledge in Java, it is possible to build bridges between standard development and mobile application conception. The point here is to understand how to make a graphical interface for Android, how to build links between your screens and to get your own app at the end of the course.

COURSE 3

Course Title	*LAMP / Web development*
Learning outcomes	Be able to understand web architecture and build your own website
Pre-requisites	Software development basis : functions, loops, scripting Linux terminal commands : how to move and explore in Linux file system
Recommended readings	*Adapt: Why Success Always Starts with Failure* by Tim Harford

COURSE CONTENT:

The main purpose of this program is to discover the web development. Understand how to design a website, how to conceive web pages for small blogs or wide social networks and how to build and manage data for all of them. Learn what are the different jobs around the web universe and to communicate with them.