Improve Your Career Options with a Professional Certificate

UCI Division of Continuing Education’s professional certificate and specialized studies programs help you increase or enhance your current skills or prepare for a new career. Courses are highly practical and instructors are qualified leaders in their field. Convenient online courses make it easy to learn on your own time, in your own way. A certificate bearing the UC seal signifies a well-known, uncompromising standard of excellence.
Computer size is dropping and the number of sensors is dramatically increasing; the digital world is indeed becoming more aware of and more connected to the physical world while the job market for technical professionals who can leverage these connections to drive business value is also growing exponentially.

By 2020, it is predicted that there will be over 50 billion devices connected to the internet. Over 100 times as many as existed just 10 years ago – that’s nearly 7 devices for every person on the planet. These devices will span industrial, commercial and consumer markets and, via Ambient Computing will be able to intelligently communicate with each other and intelligently respond to human interaction and business needs in a remarkable variety of ways. Ambient Computing, The Internet of Things (IoT), Big Data and the Cloud create a new very fertile ecosystem that has and will make our lives more effective and enjoyable and provide vast new opportunities for business to improve their operational efficiencies and provide opportunities for growth.

The Specialized Studies Program in Ambient Computing and the Internet of Things provides students with the knowledge and skills required to take advantage of this next major shift in technologies and the related exponential growth in the job demand. We will explore the tools, technologies, platforms and languages used to create exciting new connected devices. According to the Gartner research organization, 75% of executives are currently pursuing Ambient and IoT related products and/or processes in their organization to drive business value. The economic impact of Ambient and IoT is estimated to be between $10-15 trillion in the next 5-10 years. The program is designed to help both individuals and business leverage this new and exciting technological wave, understand the related technologies and create solutions that focus on the benefits of simple inter-activity and large-scale connectivity.

**Who Should Enroll**

The program is ideal for those who are looking to build foundational knowledge in Ambient Computing and IoT to improve their business operations and increase their career options. For those already in the industry, the program includes practical application courses designed to increase the depth and breadth of their understanding of Ambient Computing and IoT. The curriculum is also designed for those who are looking to enter this growing field.

**For More Information**

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Program Benefits
- Understand the business opportunities of Ambient Computing and IoT
- Design organic computing devices that sense, perceive, and react appropriately
- Have fun using new technologies that will be an ever-increasing part of our future
- Identify the main components of IoT devices
- Understand the concept of Ambient Intelligence to increase personal and industry productivity and effectiveness
- Utilize IoT standards for interoperability, machine-to-machine communication, and security
- Utilize a variety of techniques to connect to and read sensor data
- Explain different IoT technologies and their applications
- Discern the basic functionality of the Arduino and Raspberry Pi hardware systems
- Understand how to secure and monitor the entire system of devices, the connectivity, and the information exchange
- Identify related network concepts including cellular, Wi-Fi, Bluetooth LE, ZigBee, and ZWave
- Orchestrate signals and objects to fulfill complex events or end-to-end business processes

Program Requirements
A specialized studies certificate is awarded upon completion of 9 credit units (3 required courses) with a grade of “C” or better in each course. All requirements must be completed within 5 years after the student enrolls in his/her first course. Students not pursuing a certificate are welcome to take individual courses.

Program Fees
Actual fees may differ from the estimate below. Fees are subject to change without prior notice.
- Course Fees (9 required units) $2,175
- Candidacy Fee $35
- Textbooks $550
- Total Estimated Cost $2,760

IEEE Members receive 15% off of one course per quarter.

Corporate Training
Our Corporate Training specialists can deliver this program or customize one that fits your organization’s specific needs. Visit ce.uci.edu/corporate or call (949) 824-1847 for information.
the environment by receiving inputs from add-on devices such as sensors, and can control the world around them by adjusting lights, motors, and other actuators. In this class you will learn how and when to use the different types of sensors and actuators, and how to connect them to devices. Since the external world uses continuous or analog signals and the hardware is digital you will learn how these signals are converted back-and-forth and how this must be considered as you program your device. You will also learn how to build more sophisticated hardware systems using the Raspberry Pi and related expansion boards to create fun and exciting IoT devices.

Networking and Securing IoT Devices
I&C SCI X482 (3 units)
In order to be effective, IoT devices must communicate with the world around them. This class will begin with an overview of networking fundamentals that are essential to efficient IoT device design. Participants will then dive deeper into some of the networking issues that typically occur for IoT devices and how to solve them. Another key concern for networked IoT devices is Security. Since there are now so many IoT devices in literally everyone’s daily life and since the technology is relatively new, security has become a major concern for IoT device designers and their customers. Many existing IoT devices use out-of-date software, which may be vulnerable to attack. The course will cover how to design strong security into IoT devices to reduce the risk of security related issues with the device.

Designing and Integrating IoT Devices
I&C SCI X481 (3 units)
The explosive growth of the “Internet of Things” is changing our world and the rapid drop in price for typical IoT components is allowing people to innovate new designs and products at home. In this class we overview the current components of typical IoT devices and trends for the future. IoT design considerations, constraints and interfacing between the physical world and your device will also be covered. You will learn how to make design trade-offs between hardware and software. Participants will use both the Arduino and Raspberry Pi hardware/software platforms. The Arduino and Raspberry Pi sense

For class schedule, visit ce.uci.edu/IoT
Ambient Computing and the Internet of Things: Applications and Opportunities Specialized Studies

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