Computer Engineering for the IoT
Master’s Degree Course in Computer Engineering for the IoT

Context
The Internet of Things (IoT) is a global and dynamic network, with an extended and pervasive connectivity between conventional calculating devices and new generation daily objects (Smart Objects). Smart Objects give a digital alias to real identities, enabling their entrance into IoT and gradually blending the border between the physical and virtual word. In fact, we are witnessing a fundamental change of paradigm, moving from an Internet approach exclusively thought for human users to the IoT centred on autonomous, intelligent, adaptive and interoperable Cyber-Physical devices, which have become providers and users of innovative services at the same time. The IoT will revolutionize any applicative context taking advantage from synergic technologies and methodologies from sectors such as Big Data, Cyber-Physical Systems, Opportunistic Networking, Autonomic and Cognitive Computing.

The Master of Science (MSc) in Computer Engineering for the IoT provides students with in-depth knowledge and practical skills on the design, development and management of advanced Internet of Things, Big Data and cloud/edge computing. The program offers lectures (in English), and learning-by-doing teaching with laboratories, seminars and internships in Integrators, Telecommunication and Information Technology research centres and companies. The final thesis project offers students the opportunity to develop further specific skills in the framework of hands-on experiences in international ICT research labs.

Learning objectives and outcomes
The MSc in Computer Engineering for the IoT aims at training new professional figures who can work in various fields such as: Embedded System Designers (experts developing software for embedded systems used in IoT systems), IoT System Designers (experts developing IoT innovative systems and complete IoT systems - heterogeneous too – in diversified application domain) and IoT Data Analytics Specialists (experts promoting solutions for Big Data analysis with particular reference to data produced by IoT systems).

Main topics
– Low level and Embedded System programming
– Programming Internet of Things Systems
– Methodologies for IoT design
– IoT Security
– Cloud and Edge Computing
– IoT Networking
– Big Data Management
– Electronics for IoT Devices

Employability and careers
Graduates from a MSc in Computer Engineering for IoT can work as:
– Embedded System Designer (a computer engineer that designs and develops embedded systems software)
– IoT System designer (a computer engineer that designs and develops innovative IoT systems and provides solutions to integrate heterogeneous IoT systems in various domains)
– IoT data analytics specialist (a computer engineer that designs and develops big data analysis solutions specifically addressed to the IoT domain).

The skills and methodologies acquired in the study program, will enable graduates to either find employment or work as freelance for: companies specifically operating in the field of IoT systems development, system integrators and consulting companies, developers and providers of ICT applications and services.

Keywords
Internet of Thing, Big Data, IoT Security, IoT Interoperability, Embedded computing, Cloud/edge computing.

Duration: 2 years
Start date: October 1, 2021.
Total number of hours (number of ECTS credits): 3000 hours (120 ECTS credits)
Admission requirements: A minimum of three-year undergraduate degree (or equivalent) in a related field, with preference for graduates in Computer Engineering, Telecommunication Engineering, Computer Science, Electronics Engineering and Information Technology.

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