INFORMATION, COMMUNICATION AND MULTIMEDIA TECHNOLOGIES

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Who is this course for? People who have a Bachelor's degree in Arts and Multimedia, Communication Sciences, Computer Science for Business Management, Public Relations, Communication and Telecommunications Networks, Information Systems and Software, Multimedia Communication Technologies, a similar subject, or a legal equivalent.

Publication in the Official Gazette: Notice no. 10144/2012 (2nd series), no. 144 of 26 July

The Master's degree in Information, Communication and Multimedia Technologies is taught using a blended learning system and has an evening timetable. It has three specialisations that cover different and complementary areas, which means students must choose a specialisation when they register for the course. It focuses heavily on qualifying its students for professional work and aims to provide theoretical and practical knowledge with particularly emphasis on practical expertise; it includes a project rather than a dissertation. The course is especially designed for students who intend to improve their vocational qualifications, although they can also pursue an academic career.

Student profiles vary according to the specialisation chosen and range from Bachelor's degrees in communication and multimedia fields to degrees in computer science or telecommunications.

The central theme of the Master's course are next-generation networks (fibre optic, Wi-Fi, mobile networks and the internet of things) and, depending on mologythe specialisation chosen, covers digital content production (multimedia and audiovisuals), the creation of advanced computer services (mobile and cloud computing), the management, monitoring and use of next-generation telecommunications networks, including sensor networks, and security and privacy protection.

This type of Master's course requires access to laboratories and places where content, products and services can be developed and tested. Partnerships and agreements have been established with the Porto Digital Association, which manages the fibre optic and Wi-Fi networks for the city of Porto, the Porto Metropolitan Area, OPOLAB (a co-working and 3D printing space), Alcatel-Lucent Canada, and the Regional Health Administration for the North in order to ensure that students can carry out their project work in real settings and implement digital content and services for infrastructure and next-generation networks.

The agreement concluded with OPOLAB in 2013 allows students interested in this field to carry out their first business experiments in co-working and pre-incubation spaces.

What makes this course different?

ISMAI is linked by fibre optic cable to Tecmaia (the Maia Science and Technology Park) and to the metropolitan telecommunications network managed by the Digital Porto Association, which connects Maia, Matosinhos, Porto and Santa Maria da Feira. This network connects primary schools, museums, parish councils, health centres, the Casa da Música concert hall, OPOLAB, Exponor, the port of Leixões, science and technology parks, etc., and reaches more than 200 sites. It is complemented by a television network that covers almost 5,500 locations in 15 social housing areas in the city of Porto, a Wi-Fi network and a sensor network. The network includes a range of data centres and an advanced MPLS telecommunications laboratory set up at ISMAI in partnership with the Porto Digital Association and Alcatel-Lucent. For students of the telecommunications specialisation, the syllabus includes specialised training that gives them access to Network Routing Specialist industry certification (NRS1 and NRS2).

As well as general-interest television channels, the television network includes an IPTV channel, which enables multimedia and audiovisual content created by students of the course's multimedia production specialisation to be broadcast and seen. The partnerships with the Porto Metropolitan Area and the Regional Health Administration allow students to work with audiovisual solutions for a diverse range of themes, ranging from ethnographic and tourist topics to telemedicine. For example, previous students on the course were involved in a project to collect immaterial heritage in the Porto Metropolitan Area, for which 34 films were made on themes chosen by the municipalities.

Students of the computer science specialisation will have the chance to develop and use APIs, databases and content created in recent years for the Porto Metropolitan Area. With the city of Porto's transformation into a smart city, the combination of sensor networks, Wi-Fi networks and mobile devices raises several security and privacy issues. Students on the security and privacy specialisation will be involved in solving current, urgent problems.

SPECIALISATION **SECURITY AND PRIVACY**

This specialisation develops specialised knowledge about protecting computer networks and systems, protecting privacy, cryptography, safe computing, information security management, critical systems, fault-tolerant systems and service continuity.

Professional opportunities

Managing security for computer networks and systems; detecting and solving problems related to privacy for intelligent system and network users.

SPECIALISATION **SECURITY AND PRIVACY**

YEAR 1
SEMESTER 1 • 30 ECTS

5   Entrepreneurship and Technological Innovation

5   Multimedia Communication

5   Security and Privacy

5   Open-Access Next-Generation Networks

5   Applied Cryptography

5   Psychology of Security

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YEAR 1
SEMESTER 2 • 30 ECTS

5   Applied Scientific Research Methods

5   Copyright, Intellectual Property and the European Union Regulatory Framework

5   Information Security Management

5   Distributed Security

5   Safe Computing

5   Applications Based on Secure Protocols

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YEAR 2
SEMESTER 1 • 30 ECTS

30   Security and Privacy Project I

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YEAR 2
SEMESTER 2 • 30 ECTS

30   Security and Privacy Project II

SPECIALISATION **TELECOMMUNICATIONS**

Based on the prerequisite that students already have a Bachelor's degree in the computer science or telecommunications field, this specialisation develops specialised knowledge in next-generation IP networks, including routing, managing and monitoring networks and sensors, and MPLS technology in transport and access networks.

Professional opportunities

Management and administration of computer networks and systems; programming, monitoring and configuring computer networks and systems; telecommunications services for companies and telecommunications operators.

SPECIALISATION **TELECOMMUNICATIONS**

YEAR 1
SEMESTER 1 • 30 ECTS

- 5   Entrepreneurship and Technological Innovation
- 5   Multimedia Communication
- 5   Security and Privacy
- 5   Open-Access Next-Generation Networks
- 5   Data Communication and Networks
- 5   Network Management and Monitoring

YEAR 1
SEMESTER 2 • 30 ECTS

- 5   Applied Scientific Research Methods
- 5   Copyright, Intellectual Property and the European Union Regulatory Framework
- 5   Next-Generation Telecommunications Services
- 5   Access Network Technologies
- 5   Sensor Networks in Intelligent Environments
- 5   Transport Network Technologies

YEAR 2
SEMESTER 1 • 30 ECTS

- 30   Telecommunications Project I

YEAR 2
SEMESTER 2 • 30 ECTS

- 30   Telecommunications Project II

SPECIALISATION **MULTIMEDIA PRODUCTION**

This specialisation provides specialised knowledge about designing and developing multimedia and audiovisual products, including preparation and location scouting, selecting materials, editing, post-production and subtitling.

Professional opportunities

All forms of multimedia and audiovisual production, including the creation, production and distribution of institutional videos, documentaries, fictional films and digital marketing.

SPECIALISATION **MULTIMEDIA PRODUCTION**

YEAR 1
SEMESTER 1 • 30 ECTS

5   Entrepreneurship and Technological Innovation

5   Multimedia Communication

5   Security and Privacy

5   Open-Access Next-Generation Networks

5   Pre-Production and Production of Audiovisual Content

5   Multimedia for Education and Distance Learning

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YEAR 1
SEMESTER 2 • 30 ECTS

5   Applied Scientific Research Methods

5   Copyright, Intellectual Property and the European Union Regulatory Framework

5   Mobility, Social Networks and Collaborative Creation

5   Creative Processes

5   Film Shooting

5   Film Editing

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YEAR 2
SEMESTER 1 • 30 ECTS

30   Multimedia Production Project I

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YEAR 2
SEMESTER 2 • 30 ECTS

30   Multimedia Production Project II

SPECIALISATION **COMPUTER SCIENCE**

Based on the prerequisite that students already have a Bachelor's degree in the computer science or telecommunications field, this specialisation aims to enable students to gain specialised knowledge about developing software and information systems, with particular emphasis on mobile and cloud computing, information architecture and service-oriented architectures.

Professional opportunities

Senior professional positions in information systems; analysis and programming of systems and applications, including mobile devices; computer project management; cloud computing, data mining and big data.

SPECIALISATION **COMPUTER SCIENCE**

YEAR 1
SEMESTER 1 • 30 ECTS

- 5   Entrepreneurship and Technological Innovation
- 5   Multimedia Communication
- 5   Security and Privacy
- 5   Open-Access Next-Generation Networks
- 5   Geoinformatics
- 5   Agile Software Engineering Methods

YEAR 1
SEMESTER 2 • 30 ECTS

- 5   Applied Scientific Research Methods
- 5   Copyright, Intellectual Property and the European Union Regulatory Framework
- 5   Information Security Management
- 5   Mobile Applications and Location-Based Services
- 5   Cloud Computing and Distributed Architectures
- 5   Service-Oriented Architecture

YEAR 2
SEMESTER 1 • 30 ECTS

- 30   Computing Project I

YEAR 2
SEMESTER 2 • 30 ECTS

- 30   Computing Project II