MASTEAM

MASTER IN APPLIED TELECOMMUNICATIONS AND ENGINEERING MANAGEMENT

6/6/2018
UPC – Rankings as of Feb 2018

- **Academic Ranking of World Universities (ARWU) - Shanghai**
  - In the 234-267 rank in Europe and the 17-22 rank in Spain

- **Times Higher Education (THE) WUR**
  - In the 200-251 rank in Europe and the 6-7 rank in Spain

- **QS World University Rankings**
  - 120th in Europe and 6th in Spain

- **Academic Ranking of World Universities (ARWU) - Shanghai**
  - Engineering, Technology and Computer Science (2016)
  - In the 76-100 rank globally and the 2nd rank in Spain

- **QS World University Rankings by Subject**
  - Engineering and Technology
  - 24th in Europe and 2nd in Spain

- **Times Higher Education (THE) by Subject**
  - Computer Science
  - In the 40-53 rank in Europe and 1st in Spain

[https://www.upc.edu/rankings/en](https://www.upc.edu/rankings/en)
UPC – Rankings as of Feb 2018

Times Higher Education (THE) Young University Rankings
In the 60-86 rank in Europe and the 5-7 rank in Spain

Shanghai Ranking’s Global Ranking of Academic Subjects
Instruments Science & Technology
8th globally and 1st in Spain

QS World University Rankings – Top 50 under 50
8th in Europe and 3rd in Spain

QS World University Rankings by Subject
Architecture and the Built Environment
9th in Europe and 1st in Spain

National Taiwan University Ranking by subject
Telecommunications, Electrical and Electronic Engineering
47th globally and 1st in Spain

QS World University Rankings by Subject
Civil and Structural Engineering
8th in Europe and 1st in Spain

https://www.upc.edu/rankings/en
UPC Facts & figures

- 1st Spanish university in funding of EU Horizon 2020 research projects, and among the firsts across Europe

5G Barcelona

- Local and EU H2020 research project – MASTREAM groups involved
- i2Cat, UPC, CTTC, Atos, Telefonica, MWCapital, local & regional government, among other partners
- Presence of local partners in 22 out of 37 5G H2020 EU projects
5G Barcelona field trial

5G, THE NEW REVOLUTION

Beyond mobile data

- Continued user experience
- Emergency services
- IoT Massive Deployment
- Dynamic network management

10GB/s
Faster connection

- 1ms
Lower latency

10TB/s
More connectivity

+- Mbps
More flexibility
MASTEAM
MASTER IN APPLIED TELECOMMUNICATIONS AND ENGINEERING MANAGEMENT
MASTEAM

- Master in **Telecommunications Engineering**, with emphasis in
  - Internet of Things
  - Smart Cities
  - Mobility – 5G
  - Management

Areas: sensors, embedded systems, radiocommunications, optical communications, signal processing, IP protocols and services, network security, programming, data analytics and big data, project management, business plans

- **Official** program, accredited by Ministerio & Generalitat
  - Access to PhD program
  - Grants
MASTEAM

- “Mejores 5 másteres de Ingeniería en España 2016”
  http://www.elmundo.es/mejores-masters/ingenieria.html

Applied Telecommunications and Engineering Management  5º puesto

Destaca por sus contenidos actualizados y punteros, la activa metodología de aprendizaje, la internacionalización y la adaptación a las necesidades de la industria.

Universidad Politécnica de Cataluña

Sede: Barcelona
Teléfono: 934 137 056
http://eetac.upc.edu/en/masteam
Nº de plazas: 30
Duración: 60 ECTS
Precio: 3.286 Euros
“Master of Excellence” grants by FCLP

Best candidate receives 5000 euros grant

http://www.fundaciocatalunya-lapedrera.com/es/content/becas-m%C3%A1steres-de-excelencia
Two EETAC master students have received an Excellence Grant from Fundació Catalunya-La Pedrera

Albert Toro (MASTEAM) and Marta Granados (MAST) have been awarded by the Fundació Catalunya-La Pedrera in the eighth edition of the Scholarship Program for Masters of Excellence.

On October 17th, The Fundació Catalunya-La Pedrera celebrated the ceremony of the Excellence Grants program, in which Albert Toro (MASTEAM) and Marta Granados (MAST) received their grants in the eighth edition of the Scholarship Program for Masters of Excellence.

This initiative aims to recognize talent, promote excellence and impulse postgraduate quality. In this edition of the program have been awarded 52 scholarships in 51 programs among all the masters taught in Catalonia.

The awarded masters must fulfill several conditions, such as being taught by recognized professors with a research career, and being consolidated programs with a trajectory of excellence.
Faculty & Research

- World-class research in the areas of the master

Versions: (draft-toutain-lpwan-ipv6-static-context-hc)

- A. Minaburo
- Acklio
- L. Toutain
- IMT-Atlantique
- C. Gomez
- Universitat Politècnica de Catalunya
- March 02, 2017

**LPWAN Static Context Header Compression (SCHC) and fragmentation for IPv6 and UDP**

draft-ietf-lpwan-ipv6-static-context-hc-01

Abstract

This document describes a header compression scheme and fragmentation functionality for IPv6/UDP protocols. These techniques are especially tailored for LPWAN (Low Power Wide Area Network) networks and could be extended to other protocol stacks.
Faculty & Research

UPC patents that can be licensed and contact with us

The Universitat Politècnica de Catalunya and the Technical University of Munich have patented a technology that can transform everyday objects into portable medical equipment. The technology can detect an abnormality in the heart (electrocardiograph) and other data used for cardiovascular diseases. The detection system is based on the activity of two metal sensors in contact with the skin and can be used at home or in the United States and China, among other countries. The technology is presented in the United States next week at the Medical Device Manufacturers Association Conference.

Cardiovascular diseases that can be detected include arrhythmias, angina, heart attack, and stroke. The technology works by detecting a change in the electrical activity of the heart and can be used to monitor heart function continuously.

Now, researchers from the Technical University of Munich have presented an innovative medical device that can monitor heart function in real-time and is compact and mobile. The device is designed to be worn on the body and can detect abnormal heart rhythms, providing a continuous monitoring system that is more accurate than traditional monitoring devices. The device is compatible with smartphones and uses a simple-to-use interface to provide real-time heart monitoring and data analysis.
Faculty & Research

- World-class research in the areas of the master

UPC patents technology that can provide a cardiovascular diagnosis into a total of 17.5 minutes, a time that is not used for cardiovascular diagnosis.

Cardiovascular diagnosis is a type of test that translates an electrocardiogram performed on a smartphone in less time than those offered by conventional equipment.

Now, researchers are working on an electrocardiograph that translates an electrocardiogram into a smartphone in less than 17.5 minutes.

The Universitat de Barcelona (UPC) has announced that it will present its new technology at the Mobile World Congress next week at the Mobile World Congress.
5G Barcelona field trial
Alumni

- LinkedIn: 170+ contacts
Alumni

- LinkedIn: 170+ contacts
Structure

- **60 ECTS**
  - 1 year at full-time, or 1.5, 2 or more at part-time
  - 1 ECTS = 9h of classroom activities + 16 h of autonomous activities

- **Mandatory** contents: 15 ECTS

- **Optional** contents: 33 ECTS
  - Total optional offer: 42 ECTS

- **Master Thesis**: 12 ECTS
  - Performed during 2nd semester (full-time) or later
Semester 1A (14 weeks)

1A1 (7 weeks)
- Optimization for Applied Engineering Design (3)
- Network Engineering (3)
- Next Generation Wireless Communications and IoT (3)
- Sensors and Interfaces (3)
- ICT-based Entrepreneurship (3)

1A2 (7 weeks)
- Optical Networks for Cloud-Based Services (3)
- IoT & Ubiquitous IP (3)
- 5G Mobile Network Planning (3)
- Applied Image Processing (3)
- Body Sensor Nodes (3)
- Augmented Reality & Smart Objects (3)

Semester 1B (14 weeks)

1B1
- Network Security Authentication & Authorization (3)
- Low-power Systems with Energy Harvesting (3)
- Software Defined Radio (3)
- Big Data & Data Mining (6)
- Project on ICT-based Business Models (3)

1B2
- Service Engineering (3)
- Creativity & Engineering (3)
- Master Thesis (12)
- Mandatory course
- Optional course

In parenthesis, the number of ECTS credits
Mobility, Double Degree, Internships

- **Master Thesis** in more than 30 institutions in Europe, China, Mexico…

- **Double Degree** agreements
  - 1 year MASTEAM + 1 year abroad = 2 master degrees
    - University of L’Aquila (Italy)
    - Cranfield University (UK) – 8 different masters (automotive, aeronautical communications, etc)
    - Currently finishing agreements with KTH (Stockholm - SWE), IST (Lisbon - PT), Karlstad (SWE)…

- **Internships**
  - Up to 600h, paid
Internships / Cooperation with companies

- Master Theses, Internships

- Currently we have **more demand** from companies than available students!

- MASTEAM talks and presentations
  - Cellnex: SIGFOX technology, business models
  - Ficosa/Idneo: Connected car, Project management
  - Ajuntament Barcelona: Smart City network, Security
  - Datumize: Dark Data and IoT
  - Schibsted: Networking in Container/Docker environments
  - … check the EETAC website!
Weekly talks, seminars, visits
MASTEAM talks - Building Quantum Technologies - Carlos Abellán

Wednesday 9 November, 17:30h, C4-001 (Sala de Actos / Main Hall), Campus Castelldefels UPC.

The Master’s degree in Applied Telecommunications and Engineering Management (MASTEAM) organizes a weekly series of activities (talks, technical visits, discussion pannels) that complement the academic activities with real-world experiences from companies, research centres and institutions in the main topics of the master: Internet of Things, Smart Cities, 5G mobile communications, Software-Defined Networking (SDN) and Radio (SDR), cloud computing, among others.

This week’s activity will be a talk from Mr Carlos Abellán (ICFO, Institute of Photonic Sciences).

Title: Building Quantum Technologies

Abstract: In this talk we will review the state of quantum technologies at the industry level as well as current challenges and efforts towards creating scalable products. Following a pragmatic and intuitive approach, we will also discuss about those quantum effects that motivates the development of technologies. Finally, I will present a new worldwide scientific collaboration that will perform, on November 30th, several fundamental quantum physics experiments using the contribution of thousands of people like us.

Bio: BSc in Telecom engineering and MSc in Photonics Science. Experienced on bringing state-of-the-art technology from concept to customer validation. PhD student at ICFO, the Institute of Photonic Sciences, and trained at the Haas School of Business (UC Berkeley).

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Twitter: @cabellan
QUESTIONS?

More info at https://eetac.upc.edu/en/study/masters-degrees/masteam
1A1

- Optimization for Applied Engineering Design
  - DEPT: ENTEL (3)
  - Optimization with Engineering Applications
  - Nature-Inspired Algorithms. Colonies and Swarms
  - Biogeography-based techniques

- Network Engineering
  - DEPT: ENTEL (3)
  - Introduction to large-scale dynamic systems
  - Network models
  - Competitive and cooperative systems
  - Dynamic systems
Next Generation Wireless Communications and IoT

- **DEPT: TSC (3)**
  - 4G/5G networks
  - Dense cell deployment: Small Cells, HetNets, Vertical HO
  - Spectrum management: cognitive networks
  - Cooperative communications: Network Coding
  - WSN and Internet of Things

Sensors and Interfaces

- **DEPT: EEL (3)**
  - Signal chain design
  - Sensor performance assessment
  - Analog sensors and signal conditioning
  - Digital sensors and their interfaces
  - Signal chain design
1A1

- ICT-based Entrepreneurship
  - DEPT: OE (3)
    - Innovation models
    - Business models of ICT-based companies
    - Customer development. Lean startup concepts
    - Canvas analysis
    - Process analysis
    - Sales for ICT-based startups
Next-Generation Optical Networks Infrastructures for Future Cloud-Based Services

- **DEPT: TSC (3)**
  - Enabling technologies for advanced optical fiber-based networks
  - Optical systems for cloud computing and data centers interconnects
  - Enabling optical systems for energy-efficient optical networks
  - Control/Management plane for optical transport networks

IoT and Ubiquitous IP

- **DEPT: ENTEL (3)**
  - Internet evolution
  - Internet of Things: technologies and applications
  - Wireless experience enhancement
  - Mobility support
1A2

**5G Mobile Network Planning**
- **DEPT: TSC (3)**
  - Mobile system planning: coverage and capacity optimization
  - Green networks: spectrum and energy efficiency
  - HetNets
  - Self-Organizing Networks (SON)

**Applied Image Processing**
- **DEPT: TSC(3)**
  - Recent advances in 2D and 3D image capture and representation devices.
  - Next generation video coding standards for Ultrahigh-Definition and 3D systems
  - Efficient algorithms for image segmentation
  - Techniques for representation, description and analysis of color, motion and shape
  - Image processing software tools for application oriented design
1A2

- **Low-power Systems with Energy Harvesting**
  - *DEPT: EEL (3)*
  - Low-power embedded systems
  - Analog front and back ends
  - Power Management strategies
  - Battery management and energy supervision
  - Energy harvesting and power conditioning

- **Augmented Reality & Smart Objects**
  - *DEPT: AC (3)*
  - Hardware for augmented reality
  - Software and algorithms for augmented reality
  - Smart object typology
  - Applications
1B1

• Service Engineering
  ➢ DEPT: ENTEL (3)
  - Introduction to networked services
  - Dimensioning of services
  - Provisioning of telecom services
  - Operations Management
  - Conclusions, Advanced topics and Future trends

• Body Sensor Nodes
  ➢ DEPT: EEL (3)
  - Physiological and body position and movement sensors
  - Low-noise sensor interfaces
  - Interference reduction
  - Sensor node implementation (Laboratory project)
1B1

- Creativity & Engineering
  - DEPT: OE* (3)
    - Problem solving and killer applications
    - Critical thinking and the role of the mind in learning
    - Promoting creativity and team leadership
    - Creative techniques

  * Coordinated by Professor A. Elias (TSC)

- Big Data & Data Mining
  - DEPT: AC (6)
    - Storing big data
    - Processing big data
    - Tools and techniques to analyze big data
    - Automatic recognition of patterns in large data set
    - Recommender systems
1B2

- **Network Security Authentication & Authorization**
  - *DEPT*: ENTEL (3)
    - Security Introduction
    - Secure Storage of Credentials
    - Passwords/credentials auditing
    - User/service authentication
    - Authenticated services and credential sharing

- **Software Defined Radio**
  - *DEPT*: TSC (3)
    - Cognitive and Software Defined Radio
    - Cloud-RAN
    - Digital signal generation and processing strategies
    - Advanced high-efficient transceiver architectures
    - Linear and nonlinear characterization and compensation
1B2

- **Project on ICT-based Business Models**
  - **DEPT: OE (3)**
  - Planning activities to develop a new business model
  - Project management
  - Generation of an innovative idea (students project, first part)
  - Activity plan to develop a new business model (students project, second part)
  - Selling the project (students project, third part)