MASTEAM
Welcome meeting
Autumn 2019 intake

4th September 2019
Outline

- Institutional presentation
  - Your new university, campus, and school

- MASTEAM
  - Course structure, academic details, internships, etc

- Practical information
  - Legal aspects, information systems, etc

- Annex: summary of courses
Facts & figures

- UPC, the Technical University of Catalonia
  - Founded in 1971, from century-old schools
  - 18 schools in 6 cities and 9 campuses

https://www.youtube.com/watch?v=wDyRDtz-uho
Facts & figures

- UPC Figures (course 2018/19)
  - 30000 students
    - of which 22800 at bachelor, 5200 at masters, and 2200 in PhD programs
    - 1400 incoming mobility students per year
  - 3100 teaching and research staff
  - 2000 administrative and service staff

- Well positioned in rankings (specifically in the ICT field) and presence in European research projects

http://www.upc.edu/en/the-upc/the-institution/facts-figures
Facts & figures – Rankings as of Feb 2019

**Academic Ranking of World Universities (ARWU) - Shangai**
In the 236-265 rank in Europe and the 18-20 rank in Spain

**Times Higher Education (THE) WUR**
In the 253-287 rank in Europe and the 10-11 rank in Spain

**QS World University Rankings**
120th in Europe and 7th in Spain

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

**Best Global University Rankings (US News)**
Engineering
13rd in Europe and 1st in Spain

**Best Global University Rankings (US News)**
Computer Science
6th in Europe and 1st in Spain
Facts & figures – Rankings as of Feb 2019

Times Higher Education (THE) Young University Rankings
In the 61-88 rank in Europe and the 5-7 rank in Spain

Shanghai Ranking’s Global Ranking of Academic Subjects
Instruments Science & Technology
28th globally and 1st in Spain

QS World University Rankings – Top 50 under 50
8th in Europe and 2nd in Spain

QS World University Rankings by Subject
Architecture and the Built Environment
8th 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
8-9 rank in Europe and 1st in Spain
UPC Facts & figures

Top Spanish university as recipient of funding from EU Horizon 2020 research projects, and among the first positions at the European level

5G Barcelona

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

https://5gbarcelona.org/en-labs/
https://5gbarcelona.org/pilots/remotepsurgeon-pilot/
https://www.youtube.com/watch?v=jR18RemPaQE
Faculty & Research

• World-class research in the areas of the master

Carles Gomez

Roles

<table>
<thead>
<tr>
<th>Role</th>
<th>Email</th>
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<tbody>
<tr>
<td>Chair of IPv6 over Networks of Resource-constrained Nodes (6lo)</td>
<td><a href="mailto:carlesgo@entel.upc.edu">carlesgo@entel.upc.edu</a></td>
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<tr>
<td>Reviewer in Internet of Things Directorate (iotdir)</td>
<td><a href="mailto:carlesgo@entel.upc.edu">carlesgo@entel.upc.edu</a></td>
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RFCs

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<tr>
<th>RFC</th>
<th>Date</th>
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<tbody>
<tr>
<td>rfc6606</td>
<td>May 2012</td>
<td>Problem Statement and Requirements for IPv6 over Low-Power Wireless Personal Area Network (6LoWPAN) Routing</td>
</tr>
<tr>
<td>rfc7668</td>
<td>Oct 2015</td>
<td>IPv6 over BLUETOOTH(R) Low Energy</td>
</tr>
<tr>
<td>rfc8352</td>
<td>Apr 2018</td>
<td>Energy-Efficient Features of Internet of Things Protocols</td>
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Active Drafts

- draft-bormann-lwig-7228bis
- draft-gomez-frag-lpwan-considerations
- draft-ietf-lpwan-ipv6-static-context-hc
- draft-ietf-6lo-blemesh
- draft-gomez-lpwan-rto-considerations
- draft-gomez-tcpm-ack-pull
- draft-ietf-lwig-tcp-constrained-node-networks
- draft-ietf-lpwan-schc-over-sigfox
- draft-zuniga-lpwan-schc-over-sigfox
Faculty & Research

The IEEE Communications Society Charles Kao Award for Best Optical Communications & Networking Paper

Prize
Plaque and honorarium of US$500 per author (up to a maximum total of US$2,000). If there are more than four authors, the maximum of US$2,000 would be split between each author.

Description
Award to recognize the best paper published in the IEEE/OSA Journal of Optical Communications and Networking.

2019 Award Recipients
Jordi Perelló, Joan M. Gené, Albert Pagès, Jose A. Lazaro, Salvatore Spadaro
Faculty & Research

- World-class research in the areas of the master

UPC patents system for cardiovascular pre-diagnosis—in under a minute—based on contact with user’s hands or feet

The Universitat Politècnica de Catalunya (UPC) has patented an affordable, easy-to-use electrocardiograph that can provide a cardiovascular pre-diagnosis in less than a minute. It is the first system to measure both the electrical activity of the heart (electrocardiogram) and its mechanical activity (arterial pulse wave) based on data collected via two metal sensors in contact with the user’s hands or feet. The prototype has already been granted patents in Spain, the United States and China, and applications have also been filed in Europe, Japan, Korea and India. The system will be presented next week at the Mobile World Congress, along with other projects that reflect the University’s technological capabilities.

27/02/2017

Cardiovascular diseases caused three out of every ten deaths in 2012. According to the World Health Organization, that translates into a total of 17.5 million deaths. Many of these tragic outcomes could be prevented through early diagnosis, but the equipment used for cardiovascular diagnosis is usually complex to use and unaffordable for most people.

Now, researchers with the UPC’s Instrumentation, Sensors and Interfaces (ISI) Group, led by Ramon Pallàs, have patented an electrocardiograph that provides a cardiovascular pre-diagnosis in less than 60 seconds. The results are more accurate than those offered by existing devices and can be communicated to medical professionals from any place where there is mobile phone coverage.
Faculty & Research

The UPC's Faculty & Research department provides state-of-the-art education and training in the health sciences. The UPC has one of the largest research centers in Spain, the United States, and Europe. The next week will be presented on this research.

Cardiovascular disease (CVD) is a major public health concern worldwide. Now, researchers at the UPC have developed sensors that can be used for mobile phone applications. This device translates the electrical activity of the heart into a mobile phone signal that can be used for medical diagnostics.

27/02/2017

In the United States, the equipment for cardiovascular disease diagnosis is more accurate than the equipment used for mobile phones. However, the equipment used for mobile phone applications has been patented and is more accessible to the general public.
The UPC participates in a European trial of a treatment to reduce mortality of cardiogenic shock

The EURO SHOCK trial includes the main cardiovascular hospitals in nine European countries. The UPC is participating in the project with CardioSense, a device that provides an early cardiovascular diagnosis in less than 60 seconds. Over 400 patients will participate in the trial, which will begin on 1 February and continue for 34 months.

Jan 16, 2019

Cardiogenic shock is a very complex clinical condition that entails a reduction of blood flow in the most important organs of the human body due to a massive myocardial infarction. More than 50,000 patients are diagnosed this condition in Europe every year, and women and elderly patients have the worst prognosis. The last major breakthrough in this field was around 20 years ago, when it was shown that the prognosis could be improved by urgent reopening of the occluded coronary artery that causes the myocardial infarction and leads to the cardiogenic shock. However, despite several recent attempts to improve the survival of patients with this condition, no significant improvement in mortality has yet been achieved. Most patients with cardiogenic shock end up with multiple organ dysfunction syndrome, which has a mortality rate of around 50% during the first 30 days after its appearance.

The EURO SHOCK project is funded by the European Union’s Horizon 2020. The Research and Innovation programme is the first large-scale clinical trial to investigate the early application of extracorporeal membrane oxygenation (ECMO) to reduce mortality associated with cardiogenic shock. ECMO is a type of mechanical circulatory support with which deoxygenated blood is extracted from the patient’s veins, enriched with oxygen and administered directly to the arterial system, thus preserving the body’s critical organs during the most serious stage of the disease. In the European trial scheduled to begin on 1 February, patients will receive an immediate revascularisation to open the occluded artery (a stent angioplasty). If they give their informed consent, they will be randomised to receive either a standard treatment or the same treatment with the application of ECMO in the first few hours after the diagnosis of cardiogenic shock.

A team of researchers from the Universitat Politècnica de Catalunya - BarcelonaTech (UPC) and the August Pi i Sunyer Biomedical Research Institute (IDIBAPS) - Hospital Clinic de Barcelona (HCB) are participating in the project with CardioSense, a cardiovascular monitor that provides an early diagnosis with more accurate results than the current ones in less than 60 seconds. The results can be transmitted from anywhere with cell phone coverage. This “heart watchman” patented by the UPC detects both the electrocardiogram (the conventional signal of the heart’s electrical activity) and the arterial pulse wave velocity (related to blood pressure and arterial elasticity) through sensors touched by the patient’s hands or feet. The sensors can be placed on cell phone cases, tablets, watch straps, scales, steering wheel, handlebars or any other object that can be touched with both the user’s hands or feet at once. This system, developed by researchers of the UPC’s Instrumentation, Sensors and Interfaces Group (ISI), is headed by...
The UPC, a major player in the development of Industry 4.0

Of students now attending primary school, 63% will end up working in a job that does not yet exist. This disturbing fact is closely related to what is known as the fourth industrial revolution, Industry 4.0, which is transforming industry through a combination of production methods and advanced information technologies to make manufacturing adaptive and flexible. The main challenge is to make all the information available in real time by integrating the entities that make up the value chain.

Jan 09, 2019

Industry 4.0, recognised as an emerging sector in Catalonia and elsewhere, will interconnect people, machines and systems in a different way. Governments of countries and regions are striving to consolidate this transformation by promoting skills-building, training and new professional profiles in order to minimise the social disruption that it may cause.

The Universitat Politècnica de Catalunya (UPC) is one of the main agents for the development of Industry 4.0 in Catalonia, and a large part of its academic activity is directly or partially linked to valorising and capitalising on existing knowledge and accelerating knowledge creation. In fact, the UPC is already working to identify the lines of research and knowledge transfer and course offerings that will provide knowledge and talent for the technological bases of Industry 4.0.

In total, one hundred of the UPC’s research groups are related to the principles of Industry 4.0, and around fifty of them are participating directly in relevant projects. Also, about 40 of the UPC's master's degrees cover all the technologies involved in this field. In this scenario, "the UPC must be a scientific and technological hub of this new paradigm of industrial production in the digital age", explains Professor Luis Romeral, co-director of the Motion Control and Industrial Applications Research Centre (MCIA), which specialises in predictive maintenance for the industrial sector, technology based on the industrial internet of things, and big data analytics. The MCIA aims to predict failures and defects in the operation of industrial machinery, avoid emergency stoppages and dead times, and gain efficiency and productivity.
Alumni

- 93% of employed alumni
- 76% find a job in less than 3 months
- LinkedIn: 170+ contacts
Alumni

- 93% of employed alumni
- 76% find a job in less than 3 months
- LinkedIn: 170+ contacts
YOUR CAMPUS

CAMPUS DEL BAIX LLOBREGAT (CBL)
PARC MEDITERRANI DE LA TECNOLOGIA (PMT)
Work hard, play harder
A Campus (CBL) embedded in a Technological Park (PMT)
The PMT

What is the PMT?

- The PMT is a nerve centre for research and innovation that aims to foster relations between:
  - University engineering schools (CBL - Campus del Baix Llobregat of the UPC, and UOC – Open University)
  - Public research centres
  - Private companies involved in technological innovation
  - Technology-based spin-off companies

Topic Areas

- Information and Communication Technologies
- Aeronautics and Space Engineering
- Biological Engineering
- Agri-Food Engineering and Biotechnology
- Photonic Technologies
- Geo-Information and Remote Sensing
- Environmental Technologies
- Numerical Methods in Engineering

Website: http://www.pmt.es/front-page/not_available_lang?set_language=en&cl=en
Video: https://www.youtube.com/watch?v=tXwZwET0tl0
European Space Agency - Business Incubator (BIC)
Institute of Photonic Sciences
Telecommunications Technology Centre of Catalonia
School of Agricultural Engineering of Barcelona - UPC
Universitat Oberta de Catalunya (UOC, Open University)
International Center for Numerical Methods in Engineering (UPC, building shared with EETAC)
Foundation (Internet 2 Catalonia)
Companies established at the PMT

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<td>FOOD &amp; MUSIC</td>
<td>Thrombotargets Europe</td>
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<td>Rokubun</td>
<td>IRIS</td>
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D7 or Campus building – common services
Campus Library (D7)

Some figures:
- Covered area: around 3000 m², on 3 floors
- Seats: 300
- Computers: 77
- Laptops: 40
- Collections:
  - 16000 volumes at the room,
  - 1400 magazines,
  - 6000 volumes on warehouse
  - 20000 volumes in process of catalogue
- Global WiFi coverage
- Self-service printer machines
Canteen (D7)

- 7:30 AM – 8 PM during the course
- Breakfast, lunch
- Study room (open after hours and exam weekends)
Residence

Pius Font i Quer Accommodations in Castelldefels – Opened in September 2011.

- 187 rooms which include single studios, each with bathroom and kitchen, and apartments for two people, with a living-dining room, kitchen and bathroom, all fully equipped for habitation.
- Designed to accommodate university students, grant holders, researchers, guest lecturers and other users visiting the CBL and PMT, as well as general members looking for accommodation in Castelldefels.

http://www.resa.es
YOUR SCHOOL

CASTELLDEFELS SCHOOL OF TELECOMMUNICATIONS AND AEROSPACE ENGINEERING (EETAC)
EETAC

- Founded in 1991 as EUPBL in Sant Just Desvern
  - Bachelor in Telecommunications Systems Engineering
  - Bachelor in Networks Engineering (Telematics)
- 2001 – Changes its name to EPSC
  - Becomes a graduate school and starts the master program in telecommunications
  - Moves to Castelldefels Campus
- 2002 – Bachelor in Aeronavigation Engineering
- 2006 – MASTTEAM (2 years)
- 2007 – MAST – Master in Aerospace Engineering
- 2009 – Adaptation to the Bologna process (4 year BSc programs)
- 2010 – Changes its name to EETAC
- 2015 – MASTTEAM (1 year)
C4 building: classrooms, labs, teacher offices, research
C3 building: teacher offices, research labs + CIMNE
C3 & C4 buildings

Train station (through the bridge) → Main door
Parking and Olympic canal

C3
C4

Door
Red tower
Yellow tower
Blue tower
Faculty offices
## Academic Programs

<table>
<thead>
<tr>
<th>Bachelor degrees (4 years)</th>
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<tbody>
<tr>
<td><strong>Bachelor’s degree in Telecommunication Systems Engineering</strong></td>
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<tr>
<td><strong>Bachelor’s degree in Network Engineering</strong></td>
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<tr>
<td><strong>Bachelor’s degree in Aerospace Engineering (specialization in Air Navigation and Airports)</strong></td>
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<tr>
<td><strong>Double degrees (Telecom+Network, Aerospace+Telecom, or Aerospace+Network) in 5.5 years</strong></td>
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# Academic Programs

<table>
<thead>
<tr>
<th>Master degrees</th>
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<tbody>
<tr>
<td>Master of Science in Telecommunication Engineering &amp; Management (MASTEAM) – 1 year</td>
</tr>
<tr>
<td>Master in Aerospace Science And Technology (MAST) – 1.5 years</td>
</tr>
<tr>
<td>Master in Air Navigation and Airports (Air Traffic Controller habilitation – temporarily discontinued)</td>
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<tr>
<td>Master in Unmanned Aircraft (Drones) Systems Engineering, MUASED – 1 year</td>
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</table>

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<thead>
<tr>
<th>Doctoral courses</th>
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<tbody>
<tr>
<td>EETAC professors collaborate, among others, in the following PhD programs at UPC:</td>
</tr>
<tr>
<td>• Electronic Engineering</td>
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<tr>
<td>• Network Engineering (Telematics)</td>
</tr>
<tr>
<td>• Signal Theory and Communications</td>
</tr>
<tr>
<td>• Computer Science</td>
</tr>
<tr>
<td>• Management and Business Organization</td>
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<tr>
<td>• Aerospace Science and Technology</td>
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</table>
# University Departments and Faculty

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<tr>
<td>Computer Architecture</td>
<td>Physics and Nuclear Engineering</td>
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<tr>
<td>Electronics Engineering</td>
<td>Institute of Energy Technology</td>
</tr>
<tr>
<td>Network Engineering (Telematics)</td>
<td>Applied Mathematics I</td>
</tr>
<tr>
<td>Management and Business Organization</td>
<td>Applied Mathematics III</td>
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<tr>
<td>Signal Theory and Communications</td>
<td>Applied Mathematics IV</td>
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<tr>
<td>Construction Engineering</td>
<td>Applied Mathematics IV</td>
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<tr>
<td>Applied Physics and Aeronautics Engineering</td>
<td>Graphical Expression in Engineering</td>
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<tr>
<td>Materials and Structure Engineering</td>
<td>Agri-Food Engineering and Biotechnology</td>
</tr>
<tr>
<td>Geotechnical Engineering and Geo-Sciences</td>
<td>Control theory and industrial computers</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>165</strong></td>
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</table>
EETAC Research Groups

- Advanced Materials and Technologies for Communications
- Audio-visual Systems
- Broadband Networks and Services
- Control, Monitoring and Communications
- Distributed Systems Architectures
- Instrumentation, Sensors and Interfaces
- Intelligent Communications and Avionics for Robust Unmanned aerial Systems
- Mobile and Radio Communications
- Optical Communications
- Wireless Networks
- Astronomy and Astrophysics
- Combinatorial & Graph Theory and Applications
- Materials group
- Microgravity and Modelization group
- Non Linear Dynamic of Fluids group
MASTEAM
MASTER IN APPLIED TELECOMMUNICATIONS AND ENGINEERING MANAGEMENT
Scope and Objectives

- Telecommunication has evolved from audio and video communication for personal information exchange and entertainment to **pervasive data communication** in the **Mobility** and **Internet-of-Things** era.

- This master degree is intended for those willing to acquire the skills that will enable them to **conceive**, **design** and **implement cutting-edge engineering solutions** based on the latest telecommunication and Internet technologies in order to improve people’s welfare in a sustainable economy.
Scope and Objectives – 5G

5G Scenario as foreseen by ITU
Scope and Objectives – Internet of Things

- Optical networks, IP protocols, SDN
- IoT gateway
- Radiocomms, protocols, SDR
- Sensors
- Electronics, low-power
- Data centers, networks, protocols, SDN, NFV, Big Data
- Business models, service management
Approach/Strategy

- Courses cover a broad spectrum of topics including sensors to obtain data, wireless and optical technologies for data communication, advanced data-processing methods, algorithms for design optimization and the strategies to translate ideas into new devices and services.

- Yet other courses delve into cutting-edge applications such as the Internet of Things, smart objects, Body Area Networks, specialised tools such as image processing, or security, and aspects such as management and service engineering.

- Finally, students will consolidate their knowledge by applying it to a challenging problem during the master thesis.

- Teaching resources largely involve student participation in lectures, laboratory work and hands-on projects.
Structure of the program

- **Workload**: 60 ECTS credits = 1500h
  
  [https://es.wikipedia.org/wiki/European_Credit_Transfer_and_Accumulation_System](https://es.wikipedia.org/wiki/European_Credit_Transfer_and_Accumulation_System)
  
  - At UPC masters, 1 ECTS = 25h of student activities = 9h at **classroom** + 16h of **autonomous** learning

- **Mandatory contents**: 15 ECTS
  - 1A1 courses

- **Optional contents**: 33 ECTS
  - 1A2, 1B1, 1B2
  
  - Total optional offer: 42 ECTS

- **Master Thesis**: 12 ECTS
Structure of the program

First semester (7 weeks A1 courses + 7 weeks A2 courses)

- **A1**
  - OPTIM (3 ECTS)
  - NETENG (3 ECTS)
  - SENSORS (3 ECTS)
  - WICOM (3 ECTS)
  - ENTREPRENEURSHIP (3 ECTS)

- **A2**
  - OPTICAL (3 ECTS)
  - IMAGE (3 ECTS)
  - BODYSENSORS (3 ECTS)
  - ARASM (3 ECTS)
  - CREA (3 ECTS)
  - BUSINESS (3 ECTS)

Second semester (7 weeks B1 courses + 7 weeks B2 courses)

- **B1**
  - BIGDATA (6 ECTS)
  - IOT-IP (3 ECTS)
  - 5GNET (3 ECTS)
  - 5GPLAN (3 ECTS)
  - LOWPOW (3 ECTS)
  - MASTER THESIS (12 ECTS)

- **B2**
  - SERVICE (3 ECTS)
  - SDR (3 ECTS)
  - NETAUTH (3 ECTS)

Mandatory courses (15 ECTS)  Elective courses (33 ECTS out of a total offer of 45 ECTS)
Sequence constraints

Mandatory courses (15 ECTS)

Elective courses (33 ECTS out of a total offer of 45 ECTS)

Recommended

Pre-requisite
Calendar and Course Schedule

- Published in both the current website and Atenea’s MASTEAM course
  - Organized in 13 or 14 weeks – check the calendar
  - Holidays
  - Adjustments such as “Thursday Sept 26th becomes a Tuesday”

- Exam weeks, mid-semester and end of semester – check the exam calendars

- Lectures will take place mainly in classroom C4-021B
  - Ground floor, blue tower, in the middle of the C4 building
  - Laboratories: 334-5G, 331G (yellow tower), 127B and 129B (blue tower), among others

- Weekly talks / meetings on Wednesdays 17:30h
  - Research talks, companies, academic meetings
  - Attendance is **mandatory** – they are part of the program
# Academic Calendar (Autumn 2019)

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<td><strong>November 2019</strong></td>
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- **School day**
- **Non school day**
- **Holiday**
- **September 26th: Tuesday schedule**
- **Exams**
- **Marks publication deadline (12h)**
- **Deadline for revision of marks (12h)**
Academic Calendar (Spring 2019)

February 2020

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April 2020

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June 2020

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</table>

School day
Non school day
Holiday
Exams
Marks publication deadline (12h)
Deadline for revision of marks (12h)
Casteldefesta. Non school day
Half school day (29/04 Forum AeroTelecom):
April 28th Wednesday, school day from 11h to 18h
April 29th school day from 8h to 11h and from 18h to 21h
(April 28th and April 29th together are one Wednesday)
### Course schedules (Autumn 2019)

<table>
<thead>
<tr>
<th>MONDAY</th>
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<th>WEDNESDAY</th>
<th>THURSDAY</th>
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<tbody>
<tr>
<td>15:00-15:30</td>
<td>15:30-16:00</td>
<td>OPTIM 021B / 334G</td>
<td>WICOM 021B</td>
<td>ENTREP 021B</td>
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<tr>
<td>SENSORS 021B</td>
<td>NETENG 021B</td>
<td>OPTIM 021B / 334G</td>
<td>SENSORS 021B</td>
<td>NETENG 021B</td>
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<td>Talks/meetings</td>
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**Key**
- **OPTIM**: Optimization for Applied Engineering Design
- **NETENG**: Network Engineering
- **WICOM**: Next Generation Wireless Communications and IoT
- **SENSORS**: Sensors and Interfaces
- **ENTREP**: ICT-based Entrepreneurship
1A2 courses - Weeks 8 to 14 + exams week in January 2020

<table>
<thead>
<tr>
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<th>TUESDAY</th>
<th>WEDNESDAY</th>
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<tbody>
<tr>
<td>14:30-15:00</td>
<td>IMAGE 021B / 127B</td>
<td>CREA 021B</td>
<td>OPTICAL 021B</td>
<td>BUSINESS 021B</td>
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<td>15:00-15:30</td>
<td>BODYSENS 021B / 226B</td>
<td>Talks/meetings</td>
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<td>IMAGE 021B / 127B</td>
<td>ARASM 021B</td>
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<td>(15:00 to 17:30 on weeks 8, 10 and 13, 15:30 to 17:30 on weeks 9, 11 and 14)</td>
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- IMAGE: Applied Image Processing
- OPTICAL: Next-Generation Optical Network Infrastructures for Future Cloud-Based Services
- ARASM: Augmented Reality & Smart Objects
- BODYSENS: Body Sensor Nodes
- BUSINESS: Project on ICT-based business models
- CREA: Creativity and Engineering
BIGDATA  Big Data and Data Mining
IOT-IP    Internet of Things and Ubiquitous IP
5GPLAN   5G Mobile Network Planning
5GNET    Network Support for 5G
LOWPOW   Low-power Systems with Energy Harvesting

### 1B1 courses - Weeks 1 to 7 + exams week in October/November 2019

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<td>5GPLAN 021B/334G</td>
<td>BIGDATA 021B</td>
<td>LOWPOW 021B/230B</td>
<td>5GNET 021B/127B</td>
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### 1B2 courses - Weeks 8 to 14 + exams week in January 2019

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<td>SDR 021B / 330B</td>
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**SERVICE** Service Engineering  
**BIGDATA** Big Data and Data Mining  
**NETAUTH** Network Security - Authentication and Authorization  
**SDR** Software-Defined Radio
Enrolment & Qualification

- Enrolment takes place on February and September
  - First enrolment (today!) is face-to-face, presential, but the next ones can be done remotely via e-secretaria.
- You must enrol the 1x1 and 1x2 (where x = A or B) subjects – one enrolment per semester
- Marks are numerical, scale 0-10
  - You need at least a 5 to pass the course
  - In case you obtain a 9 or more, you can be eligible for “with honors” distinction (“Matrícula d’Honor”, MH).
    - Limited to the best 5% students in each course
    - But it is up to the professors to decide if any student deserves it
    - Discount in the next enrolment
Academic Performance

- If you do not pass 15 credits in your first year (2 semesters), you cannot continue your studies
  - You can request a (justified) one-time exception to the rule

- Alpha factor = credits passed / credits enrolled
  - If alpha < 0.5, your next enrolment will be limited to 24 credits
  - If alpha < 0.3 for 3 times, you cannot continue your studies
    - You can request a (justified) one-time exception to the rule
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 panels) 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).

LinkedIn: https://www.linkedin.com/in/carlosabellán
Twitter: @cabellan

Quan: 09/11/2016 de 17:30 a 18:30
On: C4-001
Persona de contacte: David Rincón
Teléfono de contacto: 37056
Afegeix un esdeveniment al calendari: iCal
Master Thesis

- Research / development work, to be defended.
  - Advised / directed by a EETAC teaching staff member
  - Written report + public presentation, evaluation committee
  - Outcome: research paper (journal, conference) + divulgative poster/blog entry

- Can be done at:
  - EETAC research groups
  - Research institutes (only those with a UPC agreement)
  - Companies (only those with a UPC agreement)

  External theses require an academic tutor-supervisor from EETAC

- Thesis proposals are published in the EETAC website
  [https://mitra.upc.es/SIA/PFC_PUBLICA.LLISTAT_OFERTS?w_codi_programa=1142](https://mitra.upc.es/SIA/PFC_PUBLICA.LLISTAT_OFERTS?w_codi_programa=1142)

- Collection of MASTEAM theses from previous years
  [https://upcommons.upc.edu/handle/2117/89303?locale-attribute=en](https://upcommons.upc.edu/handle/2117/89303?locale-attribute=en)
Internships

- You can do internships at companies (provided they have an agreement with EETAC), but you cannot obtain MASTEAM credits
- Maximum of 600h during the whole program
- When?
  - After having passed at least 15 ECTS credits
  - My advice: wait until the second semester or after 30 ECTS
- Your academic tutor must review and approve the work plan, considering your workload and academic records
- If you are older than 28 years, the School insurance does not cover the internship, and you should contract one. UPC has an agreement with CONFIDE
- More info: https://eetac.upc.edu/ca/els-estudis/practiques-academiques-externes
Mobility and Double Degrees

- Master Thesis in more than 30 partner institutions in Europe
  https://eetac.upc.edu/ca/fitxers/mobility-opportunities-masteam.pdf

- Double Degree agreements
  - 1 year MASTEAM + 1 year abroad = 2 master degrees
  - Master in Telecommunications Engineering, Università dell'Aquila (UNIVAQ), Italy. More details [here](#).
  - Cranfield University (UK):

- Negotiations ongoing with IST Lisbon and Karlstad University
Access to PhD programs

- To be admitted in a PhD program in the European Higher Education Area (EHEA), you must have:
  - An official Bachelor Degree and at least an official Master Degree
  - At least 300 ECTS credits between Bachelor and Master

- MASTREAM is an official Master degree recognized by Spanish and European authorities.

- Therefore, combined with a 240 ECTS Bachelor Degree (equivalent to 4 years full-time), it allows you to access an official PhD program
  - Foreign students must legalize/convalidate their Bachelor Degrees in the Spanish Ministry of Education
Industrial Doctorates Plan of the Government of Catalonia in which the UPC participates

List of authorized thesis for reading

DOCTORAL DEGREE IN BUSINESS ADMINISTRATION AND MANAGEMENT
# 2016/2017 Academic Year

**Doctoral programmes by subject area**

<table>
<thead>
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<th>Research area</th>
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<tr>
<td>ARCHITECTURE, URBANISM AND CONSTRUCTION</td>
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<tr>
<td>CIVIL ENGINEERING</td>
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<td>INDUSTRIAL ENGINEERING</td>
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<td>INFORMATION AND COMMUNICATIONS TECHNOLOGIES ENGINEERING</td>
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<td><strong>Undergraduate programmes</strong></td>
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<tr>
<td>ARTIFICIAL INTELLIGENCE</td>
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<td>COMPUTER ARCHITECTURE</td>
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<td>COMPUTING</td>
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<td>ELECTRONIC ENGINEERING</td>
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<tr>
<td>ERASMUS MUNDUS IN DISTRIBUTED COMPUTING</td>
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<td>ERASMUS MUNDUS IN INFORMATION TECHNOLOGIES FOR BUSINESS INTELLIGENCE (IT4BI – DC)</td>
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<td>ERASMUS MUNDUS IN INTERACTIVE AND COGNITIVE ENVIRONMENTS</td>
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<td>NETWORK ENGINEERING</td>
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<td>SIGNAL THEORY AND COMMUNICATIONS</td>
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<td>SCIENCES</td>
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Ethics

- As a UPC master student, **we expect you to**
  
  - Have a strong sense of **ethics**: cheating, copying & pasting, etc are not an option neither here nor in the professional world
  
  - **Academic Regulations for Bachelor and Master’s Degrees at the UPC**
    
    Section 3.1.2. Students’ rights and obligations during the assessment process
    
    (...) Irregular actions potentially leading to a significant variation of the marks obtained by one or more students will be considered a breach of the assessment regulations. Such behaviour will result in a descriptive mark of “Fail” and a numerical mark of 0 for the examination in question **and** the subject, without prejudice to any disciplinary proceedings that may result from that behaviour (…)

Ethics

As a UPC master student, we expect you to

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- Academic Regulations for Bachelor and Master’s Degrees at the UPC

  Section 3.1.2. Students’ rights and obligations during the assessment process

  (…) The total or partial reproduction of academic and research works, or their use for any other purpose, must have the express permission of the author or authors of the works (…)
Work load & Competences

● As a UPC master student, **we expect you to**
  
  ■ **Work hard**: a master student must demonstrate ability to produce good results and excel – be self-demanding!
  
  ■ Demonstrate **research-oriented and management skills**
  
  ■ Acquire and demonstrate **competences**
    • **Cooperative work** – working in teams
    • **Autonomous learning** – not everything will be provided
    • **Critical thinking** and self-evaluation of your work
    • **Good oral and written skills**
    • **Communication** – both with instructors and fellow students
  
  ■ Our mission is to help you discover **how far you can go**
PRACTICAL INFORMATION
Foreign (non-EU) students

**NIE / TIE card**
- Foreign visitor’s ID card
- You MUST obtain your NIE / TIE as soon as possible
- Visit
  - External relationships office at Castelldefels Campus
  - International and Corporate relations Bureau at Campus Nord Barcelona
  https://www.upc.edu/sri/en/students/international-students

**Legalisation of Academic documents**
- Spanish Ministry of Education
- Must be started as soon as possible, in order to have it finished by the end of your studies, and must include the average qualification
- Visit the Teaching Office cbl.oficina.docencia@upc.edu
Transport tips

- The Campus can be reached by
  - Train - fastest option from Barcelona
    - All R2sud and R2 lines stop at Castelldefels – do NOT take regional trains (R13, R15, R16)
    - 6 trains/h from/to Barcelona at peak hours, 4 otherwise
    - 20-25 mins from/to Sants-Estació (central station), 25-30 mins from/to Passeig de Gràcia, 35-40 mins from/to Estació de França
  - Buses
    - L95 has a stop just outside the campus, L94 a bit farther. Approx 1 h to/from Barcelona center.
    - Also, from any bus that stops at Castelldefels
    - L99: Direct bus Castelldefels center - Airport Terminal 1
  - Car
    - Parking area close to the Olympic Canal

- Check map and details here
Transport tips

● Fares & tickets
  ■ Castelldefels belongs to Zone 1 (cheapest fare)
  ■ Buy integrated tickets (1h15 mins changing between train, metro, bus, and tram). Avoid single tickets – they are much more expensive.
  ■ If you do at least 2 trips/day (14 per week) the monthly and 3-months passes (T-mes and T-trimestre, unlimited trips for 30 or 90 days) are the best option.
  ■ Train delays of more than 15 minutes entitle you to obtain a refund.

● Apps & Twitter for service notifications
  ■ Apps:
    • ADIF (real-time train schedule)
    • Rodalies de Catalunya (train issues)
    • Próximo Bus Barcelona (real-time bus schedule)
  ■ Twitter:
    • @rodalies, @rodalia2, @rod2sudcat
    • @avisosrodamies (personalized warnings)
    • @TMB_barcelona, @TMBinfo
EETAC information systems

- **ATENEA** [https://atenea.upc.edu/](https://atenea.upc.edu/)
  - An intranet for each course, with materials, assignments, etc
  - Generic courses: EETAC (Catalan), MASTEAM (English) with administrative information (normative, schedules, etc)

- **SIA / NetArea** [https://mitra.upc.es/SIA/MAPA.INICI](https://mitra.upc.es/SIA/MAPA.INICI)
  - Qualifications, transcript of records, schedules

- **e-Secretaria** [https://esecretaria.upc.edu/](https://esecretaria.upc.edu/)
  - Personal / academic data
  - Administrative processes: enrolment, academic requests, etc

- All the systems share the same login/password credentials, activated 24h after your enrolment
- The three platforms are accessible from EETAC’s website
MASTEAM Atenea course

Spring 2016 semester - Academic Calendar and Course Schedules

This section contains the following information related to the Spring 2016 semester:

- **Academic calendar** of the 2015-16 year, both in English version (static, as of January 2016), and a link to the current version in Catalan (just in case there is some minor modification).

- **Course schedules**, both in English version (static, as of January 2016), and a link to the current version in Catalan (just in case there is some minor change).

- **Exam calendars** for the mid-semester (1A1 and 1B1 courses) and end-of-semester (1A2 and 1B2) exam periods, both in English version (static, as of January 2016), and a link to the current version in Catalan (just in case there is some change).

- **Course coordinators and professors**, link to the Catalan version of the list of course coordinators and professors.
MASTEAM’s new website – under construction
Institutional e-mail address

- Format:
  name.surname(s)@estudiant.upc.edu

- **IMPORTANT!!** You will receive there all the institutional messages from the School and the professors, and course notifications

- There is no mailbox – it is an alias that forwards messages to your personal e-mail address
  - Send a message to yourself to check it – it is important
  - Check/update your data at https://esecretaria.upc.edu/

- If you need to send e-mails with your institutional address:
  https://serveistic.upc.edu/ca/correuUPC/faq/correu/enviament-est-upc-edu
Access to research databases

IEEEexplore, Springer, etc from UPC or remotely via eBIB UPC
http://bibliotecnica.upc.edu/coleccions/ebib-eng
UPC ID card

- Useful for
  - Library loans
  - Access to School after hours
  - Museum & shop discounts
  - ...

- Apply for it as soon as possible, after enrollment
  - Make sure you have updated your address in Barcelona and upload a digital picture to https://identitatdigital.upc.edu/myid
  - You should receive it at the designated address in 10-15 days
  - More information at https://www.upc.edu/identitatdigital/ca/carnetupc
UPC alumni

Courses, resources for your professional career, job opportunities – free for last year students like you – Join!
Business forum organized for and by EETAC students
- Conferences and presentations by companies
- Recruitment actions
- Get involved – more info at the Student Union
Work hard, play harder

- Castelldefesta  [https://www.youtube.com/watch?v=mH0nj585feQ](https://www.youtube.com/watch?v=mH0nj585feQ)
- Culture
  - Language courses (Catalan, Spanish)  [https://www.upc.edu/slt/en/](https://www.upc.edu/slt/en/)
  - Campus Choir  [https://cbl.upc.edu/ca/el-campus/viure-el-campus/la-coral](https://cbl.upc.edu/ca/el-campus/viure-el-campus/la-coral)
  - Catalan Traditions and Folklore
    - Main festivities
      - Santa Eulàlia (Barcelona), Feb 12th
      - Sant Jordi, April 23rd
      - Sant Joan, June 24th
    - Castells  [https://www.facebook.com/GRILLATSCBL/](https://www.facebook.com/GRILLATSCBL/)
- Sports
  - UPC Sport Service  [http://www.upc.edu/esports](http://www.upc.edu/esports)
  - Castelldefels Olympic Canal – Gym
Meet Barcelona
A space for everyone keen to discover Barcelona

Santa Eulàlia Festivities
The festivities dedicated to Santa Eulàlia, the city's co-patron saint, take place from 11 to 14 February, offering a programme to suit everyone.

http://meet.barcelona.cat/en/
Interesting links

● **UPC Welcome guide**

● **Barcelona City Hall Digital Strategy**
  https://www.youtube.com/watch?v=nDzBH8No9GE

● **5G Barcelona initiative**
  ■ CTTC - Barcelona aspires to be an European Open Lab of 5G
    http://www.cttc.es/barcelona-aspires-to-be-an-european-open-lab-of-5g/
  ■ Barcinno - Barcelona Sets Its Sights On Becoming a European 5G Open Lab - http://www.barcinno.com/barcelona-5g-open-lab/
QUESTIONS ?