# EIT Urban Mobility Master School

**Master's programmes in**
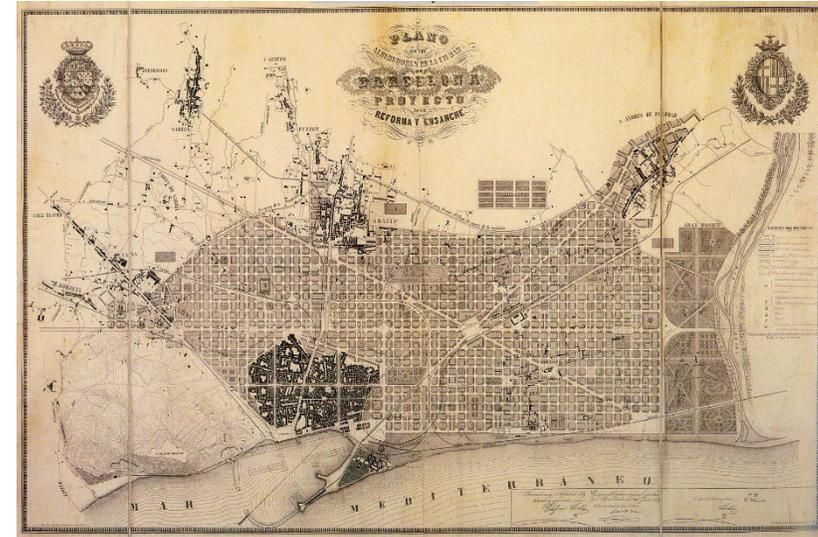
Smart Mobility Data Science and Analytics

UPC December 11th 2024

- 9 Campuses scattered in 6 cities in the Barcelona province

- 18 Schools (embracing multiple departments)

- 28,000 students, 3150 lecturers and research staff, 2000 administrative and service staff

# About Barcelona (1/2)







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# About Barcelona (2/2)

**Visit the following website:**

https://www.barcelona.cat/en/discoverbcn

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# MUM overview and modalities

- 2 year full time university master's degree promoted by the EIT Urban Mobility

  - *120 ECTS => Minimum of 2 years*

- Shared between several European universities (EIT Urban Mobility consortium)

  - *SUMT: UPC-BcnTech, TU Eindhoven (exit), KTH Stockholm, Aalto, Tartu (exit), IST Lisbon. Academic Coordinator at UPC: Prof. Francesc Soriguera (francesc.soriguera@upc.edu).*

  - *SMDSA: UPC-BarcelonaTech, TU Eindhoven, Tartu U, U Ghent, IST Lisbon. Academic Coordinator at UPC: Prof. Lídia Montero (lidia.Montero@upc.edu)*

  - *BEUM: UPC-BarcelonaTech, TU Braunschweig.*

- Different modalities: Local UPC, EIT version, and Double Degree MECCP+MUM

  - *EIT => Year 1 (entry university) – Year 2 (exit university)*

  - *UPC local => 2 years at UPC*

  - *Double degree MECCP+MUM (SUMT Track only) => 200 ECTS, 3 years.*

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# UPC Local vs EIT modalities

■ All the courses are shared => All students will share all the lectures

## MUM (EIT)

■ https://www.eiturbanmobility.eu/masterschool/

■ Application: EIT Master School Office

■ Mandatory selection of SUMT or SMDSA upon admission

■ I&E intensification is mandatory

■ Two different universities: Year 1 (entry university) + Year 2 (exit university).

■ Pan-European EIT activities => Kick-off, Summer School, Graduation.

■ Mandatory internship + thesis placement

## MUM (Local UPC)

■ https://camins.upc.edu/en/Studies/master/urban_mobility

■ Application: Escola de Camins (UPC)

■ Only I&E intensification is mandatory. Free optional course selection.

■ 2 years at UPC

■ Internship options (non-mandatory)

■ Regular mobility options (non-mandatory)

■ Double Degree with MECCP (only SUMT intensification)

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# Master School at the UPC: Common structure for all programmes

https://camins.upc.edu/en/Studies/master/urban_mobility?set_language=en

**120 ECTS, 2 years**

The EIT Urban Mobility Master School programmes are a comprehensive combination of:

- **30 ECTS mandatory courses ('common base'): 20 (S1) + 10 (S2)**
- 30 ECTS I&E Minor (blue and green): 10 (S1) + 10 (S2) + 10* (S3) (20 ECTS mandatory and *EIT Summer School accounts 3 ECTS).
- 30 ECTS Technical intensification (SUMT, SMDSA): 10 (S2) + 20 (S3)
- **30 ECTS Master's thesis project: 3**0 (S4)



## Mandatory courses

- (S1) Mobility modeling
- (S1) Operation & management of transport systems
- (S1) Data analysis in transport systems
- (S1) Introduction to supply chain
- (S2) Liveable cities & urban mobility
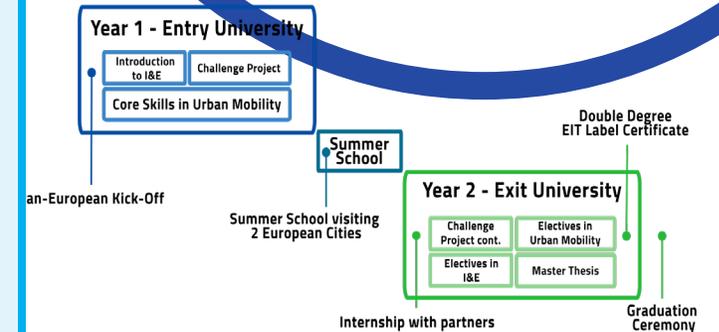- (S2) Travel demand & behavioral modeling

## I&E Minor

(S1) Innovation & entrepreneurship for world challenges

(S1) Decision making & economy in urban mobility

(S2) Project based on an innovation challenge (10 ECTS)

(S3) Summer School (3 ECTS)

(S3) Innovation & Entrepreneurship elective courses ( min 7 ECTS)

## Technical intensification

**SUMT** – Smart Urban Mobility Transitions

**SMDSA – Smart Mobility Data Science & Analytics (S2 and S3)**

## Master Thesis (30 ECTS)

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# Master School at the UPC

**Smart Mobility Data Science and Analytics Programme**

*https://www.fib.upc.edu/en/studies/masters/urban-mobility-master*

**The Smart Mobility Data Science and Analytics (SMDSA) Programme**
specialization in charge of the **Faculty of Informatics** (link to see elective courses)

- At UPC, the intensification requires to take 5 or 6 elective courses (25-30 ECTS), two mandatory in Year 1, the rest in Year 2 and the Master Thesis (30 ECTS)



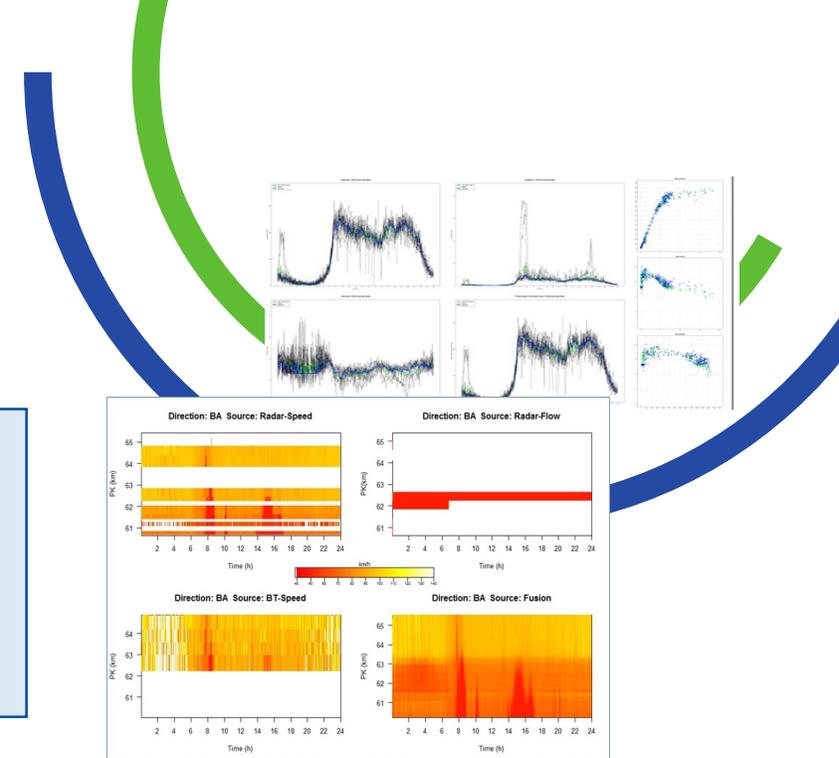✔ (S2) Machine Learning (6 ECTS)
✔ (S2) Data Manag. Transport (4 ECTS)

**Year 1
at UPC**

✔ Algorithm, Data Structures and DBs
✔ Information Retrieval and Recommender Systems
✔ Data Analysis and Knowledge Discovery
✔ Process-oriented Data Science
✔ Traffic Simulation Models

**Year 2
at UPC
(elective)**

The scope is interdisciplinary and covers all modes of urban and regional transport for personal travel and goods and logistics.

The **Programme provides** tools for creative analysis of urban system dynamics and geospatial analysis, and **advanced analytics methods**, including **artificial intelligence** methods, data collection and **data management** processes.

# Smart Mobility, Data Science and Analytics

| Participating Universities | UPC | U Tartu | TU Eindhoven | UGhent (2023-24) | IST Lisbon (2024-25) |
|---|---|---|---|---|---|
| Degree Awarded | **Master of Science, Urban Mobility** | Master of Science, Computer Science | Master of Science, Architecture, Building, and Planning | Master of Science in Industrial Engineering and Operations Research (Sustainable Mobility Analytics) | |
| Supporting Faculty | **Faculty of Informatics** <br><br> **School of Civil Engineering** | Institute of Computer Science | Department of the Built Environment | Faculty of Engineering and Architecture | Instituto de Geografia e Ordenamento do Território; Instituto Superior de Economia e Gestão de Lisboa; etc. |
| Example Career Paths | Private companies in logistics and transport management, shared mobility startups, the automotive sector, public transport operators, and cities and public institutions | | | | |
| Relevant Backgrounds | Engineering, Computer Science, or Information Technology and Systems degree | | | | |

# Who is who?

- **Miquel Estrada (miquel.estrada@upc.edu),** EIT Urban Mobility Delegate of the Rector at UPC

- **Francesc Soriguera (francesc.soriguera@upc.edu),** local Programme Coordinator (Vice Dean of ETSECCPB), SUMT Coordinator at UPC

- **Prof. Ramon Bragós (ramon.bragós@upc.edu) Coordinator I&E Intensification (Escola de Camins, UPC-BarcelonaTech)**

- **Lídia Montero (lidia.montero@upc.edu),** SMDSA Coordinator at UPC (Vice Dean of FIB-Faculty of Informatics at the UPC)

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# Master thesis

**Original and individual** work to be presented and defended before a professors committee. The work must be professional and must synthetize the competences acquired during the master.

**30 ECTS x 30 h/ECTS = 900 h dedication**

Student must **actively look for a thesis director** and define a master thesis topic

Check master thesis proposals on:

- Specific for the MUM – Link (access with UPC Google ID)

- Civil Engineering School – Link (access to Portal Camins)

**Enrolment**: after having passed 60 ECTS of the master (2nd year)

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# Internships

- Local version does NOT have mandatory internship

- EIT version DOES have mandatory internships

  - 4 week (full-time equivalent) internship + 8 week (full-time equiv.) situated master thesis

  - Or a 12 week (full-time equivalent) situated master thesis

  - Internships must be done during the masters' duration (1st year, 2nd year, and summers).

- All internships are NON-CURRICULAR => They do not grant any master's ECTS

- Securing an internship is the **student responsibility**

- Compensation by the company to the student with a min. wage of 9 €/hour.

- Internship opportunities published through the Camins School webpage

  - https://camins.upc.edu/ca/universitat-empresa/practiques

- Internship management and administrative tasks contact:

  - practiques.camins@upc.edu

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# Location

- **Campus Nord**. Barcelona School of Informatics, Barcelona School of Telecommunication Engineering, Barcelona School of Civil Engineering

# Mobility Office-International Relations Bureau

- https://www.upc.edu/sri/en/students/students-mobility-office/incomings

# Important dates (1/3)

**EIT – 1ˢᵗ admission period (**15 November 2024 – 31 January 2025)

- **March 17th -** Notification of acceptance by the EIT UM

- **April 17th -** Student has to accept the admission position in the EIT UM.

**EIT – 2ⁿᵈ admission period  (**1 February – 15 April 2025)

- **May 27ᵗʰ** - Notification of acceptance by the EIT UM

- **June 9ᵗʰ -** Student has to accept the admission position in the EIT UM.

- Not Recommended for Non-EU students (visa application).

# Important dates (2/3)

## Enrolment at UPC

■ **Mid September 2025** – Online enrolment through UPC e-secretaria

## Classes start at UPC

■ **September 2025** – Presential lectures start at UPC, depending on Civil Engineering School and Faculty of Informatics (FIB) calendars (for SMDSA courses lectured at FIB). Not available yet.

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# Useful links and e-mails

- MUM website: https://camins.upc.edu/en/Studies/master/urban_mobility

- Escola de Camins website (studies):
  https://camins.upc.edu/en/Studies?set_language=en

  Look for Master in Urban Mobility in masters' section

- Barcelona School of Informatics:
  https://www.fib.upc.edu/en/studies/masters/urban-mobility-master

- EIT Master School: https://www.eiturbanmobility.eu/academy/masterschool/

- Contact information:

  – Admissions and enrolment: admissions.masters.camins@upc.edu

  – Academic information and procedures: masters.camins@upc.edu

  – Internships: practiques.camins@upc.edu

  – EIT master school: masterschool@eiturbanmobility.eu

  – ICT services: serveistic.camins@upc.edu

Thank You!