Master’s degree in Urban Mobility
Presentation

■ Prof. Francesc Soriguera (francesc.soriguera@upc.edu)
  - MUM Coordinator – (Civil Engineering School, UPC-BarcelonaTech)

■ Darisbel Correa (darisbel.correa@upc.edu)
  - MUM Administrative Support – (Civil Engineering School, UPC-BarcelonaTech)

■ Moemin Sowareldahab, Gorka Pradas
  - Current MUM students
Presentation overview

- **Why** this master?  **Why** in the UPC – BarcelonaTech?
- **What** is this master?
  - EIT Urban Mobility
- More **practical information**:
  - Overview, modalities and intensifications
  - Curriculum
  - Mobility and internships
  - Expected results
  - Languages
  - Where & when
  - Admission
  - Useful links and e-mails
Why a master in Urban Mobility?

- **System wide** approach to urban mobility => Multiple stakeholders, technologies, managing strategies, funding options, etc.

- Analysis, planning, management, optimization, financing of...
  - Transport & Mobility
  - Supply chain & Urban logistics

- Innovation and Entrepreneurship.

Plan, design, implement mobility SERVICES

- This master deals with really **hot topics** in our societies, with a brilliant future in the academic and professional fields
A revolution in urban mobility

- We are in the era of the (urban) mobility revolution
  - Efficient collective transportation systems
  - Green mobility => pedestrians, cyclists... return cities to people
  - Rethink the urban space => tactical urban planning, reduce the role of the car
  - Shared mobility initiatives => Uber, Car-to-Go, Bicing, eCooltra
  - Autonomous vehicles => impact to mobility management
  - Smart cities => ICT & Big Data applied to urban services
Innovation & entrepreneurship...

- From innovative ideas to real-life applications
- Mobility products
- Best practices and case studies
- Urban mobility living labs
With a brilliant future...

- There is a lack of qualified professionals and decision makers in these topics.
- Many sectors of professional activity:
  - Almost any company in any sector requires a professional to deal with Transportation & Logistics.
  - Mobility and transportation attract the attention of Administrations and Private Companies.
  - Multidisciplinary sector, with lack of engineering backgrounds.
  - 93% of professional insertion rate. Lots of professional opportunities.
- Transportation & Logistics amongst the technical studies with more potential:
  - According to experts view and surveys.
  - EIT urban mobility.
Why in the UPC – BarcelonaTech?

- 9 Campuses scattered in 6 cities in the Barcelona province
- 18 Schools (embracing multiple departments)
- ≈ 30,000 students, ≈ 3,000 teaching and research staff, ≈ 2,000 administrative and service staff
About Barcelona (1/2)
Non-curricular activities
About Barcelona (2/2)  

https://www.barcelona.cat/en/discoverbcn
EIT Urban Mobility

- Knowledge and Innovation Community (KIC) within the European Institute of Innovation and Technology
- [https://www.eiturbanmobility.eu](https://www.eiturbanmobility.eu)
- A European initiative to create livable urban spaces
- Headquarters in Barcelona
- UPC is an academy member of the consortium
- EIT Urban Mobility Master School – Master in Urban Mobility [https://www.eiturbanmobility.eu/masterschool/](https://www.eiturbanmobility.eu/masterschool/)
- Internationalization of the MUM
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-BarcelonaTech, TU Eindhoven (only exit), KTH Stockholm, Aalto University, University of Tartu (only exit), Técnico IST Lisboa.
  - **SMSA**: UPC-BarcelonaTech, University of Tartu, Ugent, Técnico IST Lisboa.

- Different modalities: Local UPC, EIT, and Double Degree MECCP+MUM
  - **EIT** => Year 1 (entry university) – Year 2 (exit university)
  - **UPC local** => 2 years at UPC
  - Double degree MECCP+MUM => 200 ECTS, 3 years.
MUM Intensifications

■ 2 Programs or intensifications:
  - **Sustainable Urban Mobility Transitions (SUMT)** => Academic coordinator UPC: Prof. Francesc Soriguera (francesc.soriguera@upc.edu)
  - **Smart Mobility Data Science & Analytics (SMDSA)** => Academic coordinator UPC: Prof. Lídia Montero (lidia.montero@upc.edu)

■ Mandatory minor in Innovation and Entrepreneurship
  - **Innovation & Entrepreneurship minor** => Academic coordinator UPC: Prof. Ramon Bragós (ramon.bragos@upc.edu)
# UPC Local vs EIT modalities

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

<table>
<thead>
<tr>
<th>MUM (EIT)</th>
<th>MUM (Local UPC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two different universities: Year 1 (entry university) + Year 2 (exit university).</td>
<td>2 years at UPC</td>
</tr>
<tr>
<td>Application: EIT Master School Office</td>
<td>Application: Escola de Camins (UPC) (Later admission periods)</td>
</tr>
<tr>
<td>Mandatory selection of SUMT or SMDSA upon admission</td>
<td>Only I&amp;E intensification is mandatory. Free optional course selection.</td>
</tr>
<tr>
<td>I&amp;E intensification is mandatory</td>
<td>Internship options (non-mandatory)</td>
</tr>
<tr>
<td>Pan-European EIT activities =&gt; Kick-off, Summer School, Graduation.</td>
<td>Regular mobility options (non-mandatory)</td>
</tr>
<tr>
<td>Mandatory internship + thesis placement</td>
<td>Double Degree with MECCP (only SUMT intensification)</td>
</tr>
</tbody>
</table>
MUM Curriculum (1/3)

120 ECTS, 2 years

Mandatory courses (30 ECTS)
- Mobility modeling (5 ECTS)
- Operation & management of transport systems (5 ECTS)
- Data analysis in transport systems (5 ECTS)
- Introduction to supply chain (5 ECTS)
- Liveable cities & urban mobility (5 ECTS)
- Travel demand & behavioral modeling (5 ECTS)

I&E Minor (30 ECTS)
- Innovation & entrepreneurship for world challenges (5 ECTS)
- Decision making & economy in urban mobility (5 ECTS)
- Project based on an innovation challenge (10 ECTS)
- I&E elective courses (min 10 ECTS)

Technical intensification (30 ECTS)
- SUMT – Smart Urban Mobility Transitions
- SMDSA – Smart Mobility Data Science & Analytics

Master Thesis (30 ECTS)

Check details of curriculum & courses
## MUM Curriculum (2/3)

### FIRST YEAR

<table>
<thead>
<tr>
<th>S1 - FALL</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation &amp; entrepreneurship for world challenges</td>
<td>5</td>
</tr>
<tr>
<td>Decision making &amp; economy in urban mobility</td>
<td>5</td>
</tr>
<tr>
<td>Mobility modeling</td>
<td>5</td>
</tr>
<tr>
<td>Operation &amp; management of transport systems</td>
<td>5</td>
</tr>
<tr>
<td>Data analysis in transport systems</td>
<td>5</td>
</tr>
<tr>
<td>Introduction to supply chain</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

### S2 - SPRING

| Project based on an innovation challenge                    | 10   |
| Liveable cities & urban mobility                            | 5    |
| Travel demand & behavioral modeling                         | 5    |

**SUMT** - 2 Electives from the following list (10 ECTS):

| Data analysis in transport systems                          | 5    |
| Optimization models for transportation networks             | 5    |
| Railway transport                                           | 5    |
| Public transport                                            | 5    |
| Traffic simulation models                                   | 5    |
| Sustainable mobility                                        | 5    |
| Port management & maritime transport                        | 5    |
| **Total**                                                  | **30** |

### Core courses of SUMT Programme

- Port management & maritime transport

### Elective courses of SUMT Programme

- SMDSA

| Innovation and entrepreneurship courses                     | 6    |
| Data management for transportation                          | 4    |

### SMDSA – 2 intensification courses (10 ECTS):

| Machine Learning                                          | 6    |
| Data management for transportation                         | 4    |
| **Total**                                                 | **30** |
## SECOND YEAR

<table>
<thead>
<tr>
<th>S3 - FALL</th>
<th>ECTS</th>
<th>S4 - SPRING</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation &amp; entrepreneurship elective courses</td>
<td>Min. 10</td>
<td>Master thesis</td>
<td>30</td>
</tr>
<tr>
<td>Relevant elective courses from the selected intensification</td>
<td>20</td>
<td>Total</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30</strong></td>
<td><strong>Total</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

### Innov. & entrepreneurship electives (Min. 10 ECTS)

<table>
<thead>
<tr>
<th>Course</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>EIT Summer School (only EIT students)</td>
<td>3</td>
</tr>
<tr>
<td>Product or service development project</td>
<td>4</td>
</tr>
<tr>
<td>Technology asset management</td>
<td>5</td>
</tr>
<tr>
<td>Case studies in urban mobility</td>
<td>5</td>
</tr>
<tr>
<td>Viability of business project <em>(S4 Spring)</em></td>
<td>6</td>
</tr>
</tbody>
</table>

### SUMT electives (4 courses)

<table>
<thead>
<tr>
<th>Course</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freight transport</td>
<td>5</td>
</tr>
<tr>
<td>Vehicle routing models</td>
<td>5</td>
</tr>
<tr>
<td>Smart mobility (SMART)</td>
<td>5</td>
</tr>
<tr>
<td>Airport management</td>
<td>5</td>
</tr>
<tr>
<td>Traffic</td>
<td>5</td>
</tr>
<tr>
<td>Mobility &amp; development</td>
<td>5</td>
</tr>
</tbody>
</table>

### SMDSA electives (4 courses)

<table>
<thead>
<tr>
<th>Course</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algorithms, Data Structures and Databases</td>
<td>6</td>
</tr>
<tr>
<td>Information Retrieval and Recommended Systems</td>
<td>6</td>
</tr>
<tr>
<td>Data Analysis and Knowledge Discovery</td>
<td>6</td>
</tr>
<tr>
<td>Process-Oriented Data Science</td>
<td>6</td>
</tr>
<tr>
<td>Traffic Simulation Models <em>(S4 Spring)</em></td>
<td>5</td>
</tr>
<tr>
<td>Data management for transportation <em>(S4 Spring)</em></td>
<td>4</td>
</tr>
</tbody>
</table>
Mobility & Internships

■ Mobility
  - Mobility options for S3 or/and S4
  - Apply early for mobility => https://camins.upc.edu/ca/estudis/mobilitat
  - UPC agreements with most of EU universities, and some overseas (China, USA, Canada)

■ Internships
  - 90% of students take an internship during the master.
    ■ Local version does NOT have mandatory internship
    ■ EIT version DOES have a mandatory 12 week internship
  - Internships are not recommended during S1
  - All internships are NON-CURRICULAR => They do not grant any master’s ECTS
  - 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
Expected results

■ Group of 30 students admitted

■ Students’ origins:
  - UPC and other nationals (15%)
  - International (85%) => EU and overseas.

■ >95% students pass the enrolled courses

■ 4% of the students quit at the 1st year
Practical information (1/2)

■ Language => 100% in English
  - MUM Local version
    ■ English Level – B2 => Most certificates are accepted.
  - MUM EIT version
    ■ English Level => IELTS>6.5; TOEFL>92

■ When?
  - From September to May.
    ■ Fall semester (Q1): starts late September; ends late January.
    ■ Spring semester (Q2): starts mid February; ends late May / early June.
  - See Escola de Camins masters’ academic calendar: https://camins.upc.edu/en/Studies/academic-calendars
Practical information (2/2)

■ When?
  - Lectures are mainly scheduled on afternoons and evenings (14-20h).
  - See MUM timetable: https://camins.upc.edu/ca/pdf/pdf-estudis/masters/master-in-urban-mobility/mum_timetable
  - 18 hours/week of lecture (30 ECTS / Semester).

■ Where?
  - UPC North Campus (Civil Engineering School) => Escola de Camins
Admission

■ Maximum of 30 students are admitted every year

■ Bachelor studies with direct admission include
  - Bachelor's degrees in **engineering** (Industrial Engineering, Civil Engineering, Construction Engineering, Telecommunications Engineering, Informatics Engineering, Engineering Physics, other engineering fields).
  - Bachelor's degrees in **science** (Physics, Mathematics, Statistics) or other similar bachelor's degrees.
  - Bachelor degrees in geography, urban planning, architecture, or similar (=> Without a strong analytical and mathematical content; **may require additional effort**)

■ Students without technical / technological bachelor studies will not be admitted or will require bridging courses.
  - Bachelor studies in law, business administration, economics, arts, etc.
Application dates

January 15th to July 1st 2024
Application Period

- 6 selection dates: March 28th, May 8th, May 22nd, June 6th, June 19th, July 1st. => Non EU candidates are to apply early.

Resolved maximum 15 days after the selection date

Notification by e-mail

Information

Master in Urban Mobility: https://camins.upc.edu/ca/estudis/master/urban_mobility

Application: https://www.upc.edu/en/masters/access-admission-enrolment/pre-enrolment

Contact: admissions.masters.camins@upc.edu

Questions about: Application, admission requirements, regulations, enrolment,...
Useful links and e-mails

- MUM website: https://camins.upc.edu/en/Studies/master/urban_mobility
- EIT Master School: https://www.eiturbanmobility.eu/academy/masterschool/
- Contact information:
  - Master in Urban Mobility administrative support: urban.mobility@upc.edu
  - 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
Master’s degree in Urban Mobility