

eraman ta zabal 2020



Universidad  
del País Vasco

Euskal Herriko  
Unibertsitatea



With the support of the  
Erasmus+ Programme  
of the European Union

**Erasmus Mundus Master**

# MASTER IN SMART CITIES AND COMMUNITIES (SMACCS)

Heriot-Watt University / University of the Basque Country /  
International Hellenic University / Université de Mons

[www.ehu.eus](http://www.ehu.eus)

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## INTRODUCTION & OBJECTIVES

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The programme is designed to educate the next generation of engineers and researchers in Smart Cities and Communities by learning best practice from 4 of Europe's most prestigious universities and by fostering collaboration with industry through research.

The SMACCs is aligned with the smart city concept and envisaged ecosystems by providing an international, interdisciplinary programme of study, whose graduates will have attained both core and specialized knowledge in the diverse area of smart cities and communities, allowing them to succeed in a highly demanding labour market.

The SMACCs offers different specializations:

- Smart Grids and Demand Management (HWU, U.K.).
- Sustainable Urban Planning, Energy and Transport. (UMONS, Belgium).
- Information and Communication Technologies (IHU, Greece).
- Energy Efficiency on Buildings (UPV/EHU, Spain).

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## ENTRY PROFILE

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Candidates need to have at minimum a Bachelor degree in engineering (mechanical, chemical, electrical, civil, environmental, architectural, etc.) or in sciences (physics, chemistry, mathematics, computer science, operation) or in economics but with an engineering background. A case-by-case study will be employed for other degrees (i.e., architecture, law, business, social, etc.), with an equivalent academic degree of minimum three years of undergraduate study corresponding to 180 ECTS.

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## CAREER OPPORTUNITIES

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After completing the programme, our graduates will be able to managing project teams in urban development and engage in the management of development projects in municipalities and public administration. They will be able to design energy-conversion systems in a smart-city and community context and work in companies and institutions with a vision on the development of smart cities and communities of the future, as, for instance, Project Manager for Smart Communities or Professional Consultants in public administration or in industry, technology and research centers.

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## ABOUT THE COURSE

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### Teaching place:

The general mobility arrangement within the academic programme is as follows:

- SMACCs students start to earn their first 30 ECTS credits during their first academic year at HWU (U.K.) or UPV/EHU (Spain).
- SMACCs students continue to earn their next 30 ECTS credits during their first academic year at UMONS (Belgium) or IHU (Greece).
- During their 3rd semester, SMACCs students will study at HWU or UPV/EHU.

**Teaching type:** On-site.

**Teaching language:** English.

### Approximate fees:

- For MSc scholarship students, all tuition and administration fees will be covered by the scholarship.
- All MSc non-scholarship students pay an annual fee (Category A (E.U.) students 4,000€/year or 8,000€/2-years and Category B (Non-E.U.) students 8,000€/year or 16,000€/2-years)

**Calendar:** the SMACCs academic year typically starts on September 1 and ends on August 31 of the following year, taking into account the academic calendar of the individual partner Universities.

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## TEACHING LOAD

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Compulsory subject courses 46 Credits ECTS	Elective courses 44 Credits ECTS	Master Thesis 30 Credits ECTS	Total 120 Credits ECTS
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## TRAINING SYLLABUS

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The SMACCs Master Programme is spread over 4 academic semesters, for a total of 120 ECTS. Students are distributed across multiple Full or Associated Partners according to their chosen study path. Regardless of the path chosen, students will take courses by the respective partners in the first 3 semesters while the last semester will be dedicated to the Master thesis. The common language of instruction of the programme for the partner institutions is English.

The Specialisations offered in SMACCs are on:

- Smart Grids and Demand Management (HWU, U.K.)
- Sustainable Urban Planning, Energy and Transport (UMONS, Belgium)
- Information and Communication Technologies (IHU, Greece)
- Energy Efficiency on Buildings (UPV/EHU, Spain)

# MOBILITY PATHS REGARDING THE FIRST THREE SEMESTERS\*

First or third semester

Second semester

First or third semester



## Mandatory (24 ECTS)

- Conversion, Storage and Energy Transfer (ECTS-6)
- Energy Systems Integration (ECTS-6)
- Sustainable transport in Cities (ECTS-6)
- Sustainable Urban Planning and Buildings (ECTS-6)

Path 1

Path 2

## Mandatory (22 ECTS)

- Renewable Energy Technologies (ECTS-7.5)
- Electrical Power Systems (ECTS-7.5)
- Distributed Generation and Smart Grid modelling (ECTS-7)

## Elective (8 ECTS)

- Advanced Writing Skills and Research Preparation (ECTS-4)
- Strategic Project Management for Erasmus Mundus (ECTS-4)
- Foundations of Energy for Erasmus Mundus (ECTS-4)
- Environmental & Energy Economics for Erasmus Mundus (ECTS-4)

## Elective (6 ECTS)

- Strategic Energy and Transport Management (ECTS-6)
- Optimization Tools for Energy Systems (ECTS-6)
- Innovation and Entrepreneurship (ECTS-3)
- Carbon, Capture and Reuse (ECTS-3)

## Mandatory (22 ECTS)

- Heat and Mass Transfer in buildings. High energy performance buildings envelopes (ECTS-6)
- High Performance of HVAC Systems (ECTS-6)
- Renewable Energy in Buildings (ECTS-6)
- Building energy performance calculation (ECTS-6)

## Elective (8 ECTS)

- Certification and energy audits. Energy management (ECTS-3)
- European directives and research actions related to energy efficiency in buildings (ECTS-3)
- Life cycle analysis and sustainability (ECTS-3)
- Thermal characterization of whole buildings and building components (ECTS-3)

Second semester



INTERNATIONAL HELLENIC UNIVERSITY

## Mandatory (24 ECTS)

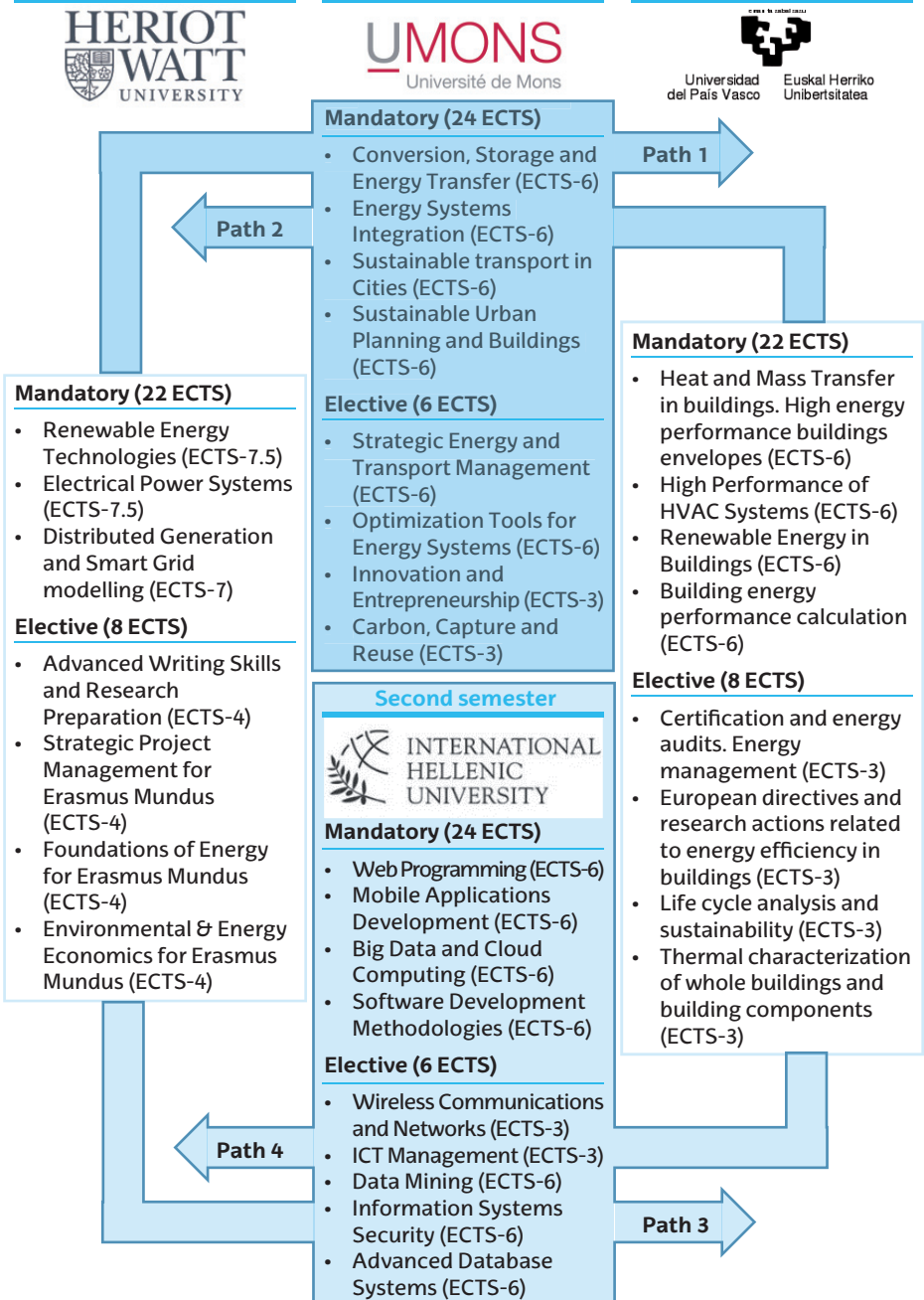
- Web Programming (ECTS-6)
- Mobile Applications Development (ECTS-6)
- Big Data and Cloud Computing (ECTS-6)
- Software Development Methodologies (ECTS-6)

## Elective (6 ECTS)

- Wireless Communications and Networks (ECTS-3)
- ICT Management (ECTS-3)
- Data Mining (ECTS-6)
- Information Systems Security (ECTS-6)
- Advanced Database Systems (ECTS-6)

Path 4

Path 3



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## CONTACT

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### Academic information:

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## PARTNERS WITH A COOPERATION AGREEMENT

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**Curtin**  
University of Technology

**U.PORTO**  
UNIVERSIDADE  
DO PORTO



Université  
de Valenciennes  
et du Hainaut-Cambresis



**unesp**  
UNIVERSIDADE ESTADUAL PAULISTA  
"JULIO DE MESQUITA FILHO"

**South Valley University**  
Founded in 1995

**tecnalia**  
Ecología. Tecnología.

**inegi** driving science  
& innovation

**INNOVATION  
ZONE S.A.**

**ORES**  
INSTRUMENTOS DE MEDIDA SAS & ELECTRONIC



Hellenic Institute  
of Transport (H.I.T.)



<https://www.ehu.eu/master/master-smart-cities-communities>



<http://www.smaccs.eu/>

