



JOINT MASTER'S DEGREE IN

Sustainable and Resilient Pavement Engineering

www.surpave.eu

Programme developed by a consortium of 4 universities in Belgium, India, Italy and Portugal with the support of Associated Partners worldwide.



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*Imagine a career
where you can
shape the future
roads we drive on*

ABOUT

The challenges for you, the future generation

Our cities are expanding, our vehicles are evolving, and the demand for smart and durable roads is greater than ever. Governments, road managers, new project developments ... they are waiting on novel solutions created by the next generation of engineers. **Pavement engineering is not just about asphalt and concrete; it's about innovation, sustainability, and creating the pathways of tomorrow.**

Are you interested in **innovation**?

As a pavement engineer, you'll be at the forefront of designing resilient and eco-friendly infrastructure that can withstand the test of time and the pressure of changing climate. This field offers the exciting challenge of integrating cutting-edge solutions like self-healing asphalt or permeable pavements, which help manage stormwater and reduce urban heat. You'll have the opportunity to pioneer solutions that make our roads safer, smoother, and smarter.

Are you thrilled by **finding pioneer solutions**?

But that's not all! As a pavement engineer, you'll be a key player in the fight against climate change. The industry is shifting towards greener practices, like recycling old roads into new ones and developing carbon-neutral paving methods. You'll help reduce the environmental impact of transportation infrastructure while ensuring that the roads we rely on are built to last. Imagine working on projects that connect communities, support economies, and enhance the quality of life. Whether it's designing high-speed expressways, crafting durable rural roads, or innovating in urban spaces, your work will have a long lasting impact on millions of people.

Are you excited by taking responsibility in **societal challenges**?

Join a field that's always evolving, where your creativity and problem-solving skills can shine. As technology advances, so will your role, with opportunities to explore autonomous vehicles, smart sensors, and the integration of renewable energy into road systems. You'll be shaping the future of transportation, making it more sustainable and efficient. Pavement engineering isn't just a career-it's a chance to make a difference. It's a dynamic, exciting field that needs passionate, forward-thinking individuals like you to take on the challenges of tomorrow. Step into a career where you're not just building roads-you're building the future.

ABOUT

The Master's Programme

The programme has been developed by POWERCN2050, a consortium of four top universities from Belgium, Portugal, Italy and India, all with large experience in sustainable and resilient pavement engineering, to make the difference in future pavement engineering. The development of the Master's Programme has been supported by the European Commission through the call ERASMUS-EDU-2023-EMJM-DESIGN (project number 101127037), under the project "POWERCN2050: Pavement Opportunities Worldwide in Education and Research for Climate Neutral 2050."

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The consortium will apply for an Erasmus Mundus Joint Master in February 2026. On approval the Erasmus Mundus Joint Master (1st batch) will start in September 2026.

The Joint Master in Sustainable and Resilient Pavement Engineering SURPAVE is a 2-years master of 120 credits. The programme aims to cultivate a generation of professionals capable of integrating sustainability and resilience principles into the design, construction, use and management of pavements. The primary objective of this new Joint Master is to contribute to a climate resilient and sustainable pavement infrastructure and recognising the pivotal role of road infrastructure in the development of countries. The innovative curriculum emphasises a multi-disciplinary approach, encouraging engineers to adopt a broad vision that encompasses sustainable technologies, people, and processes, to meet the requirements of the future labour market. With this programme the participants contribute to achieving the Sustainable Development Goals of the United Nations.

TOPICS

- Sustainable and Resilience in Project Management
- Introduction to Data Mining, Artificial Intelligence and Digitalization
- Airports and Railways
- Highway Environment Management Systems
- Circular Life-Cycle Based Pavement Management
- Sustainable Geometric Design Practices
- Spatial Technology for Smart Roads

CAREER OPTIONS

The knowledge, skills and experience obtained throughout the programme lead to the development of successful pavement engineers ready to excel in industry. The technical focus on the next generation of pavement technologies ensures that the knowledge and skills acquired will remain relevant to the industry for many years to come. Graduates will be able to successfully take on management or technical positions in several aspects of pavement engineering including design, consultancy and management.

Additionally, the research skills developed throughout the programme will prepare graduates for opportunities in advanced research, e.g., MPhil and PhD.



ABOUT

About the programme content & mobility

SEMESTER 1 - 30 ECTS

Basic Technologies and Research Tools for Pavement (UAntwerp) - Antwerp, Belgium

- Sustainability and Resilience in Project Management (6 EC)
- Introduction to Data Mining, Artificial Intelligence and Digitalization (6 EC)
- Pavement Analysis, Design and Management (6 EC)
- Material Testing and Evaluation (6 EC)
- Elective courses (6 EC)
 1. Acoustics
 2. Debating Development in Global Mobility
 3. Safety and Resilience
 4. Selection by the student

SEMESTER 2 - 30 ECTS

Specialisation module at the partners. The student will choose a specialisation and destination

Track 1: Smart Pavement Engineering (UMinho)
Guimarães, Portugal

- Transportation Geotechnics (5 EC)
- Sustainable and Multifunctional Pavement Materials (5 EC)
- Enhanced and Smart Pavement Surface Functions (5 EC)
- Digitalization of Pavement Monitoring (5 EC)
- Highway Environment Management Systems (5 EC)
- Airports and Railways (5 EC)

Track 2: Sustainable Pavement Engineering (UNIPA)
Palermo, Italy

- Sustainable Transport Infrastructure (6 EC)
- Sustainable Pavement and Embankment Materials (6 EC)
- Circular Life-Cycle Based Pavement Management (6 EC)
- Sustainable Geometric Design Practices (6 EC)
- Smart Solutions for Infrastructure Management (6 EC)

Track 3: SURPAVE Global Perspective (MAHE)
Manipal, India

- Advanced Sustainable Pavement Materials and Technologies (6 EC)
- Soil Stabilisation Techniques for Resilient Roads (6 EC)
- Spatial Technology for Smart Roads (6 EC)
- Economic of Eco-friendly Road Infrastructure (6 EC)
- Computer-Aided Road Design (6 EC)

SEMESTER 3 - 30 ECTS

Industrial Training Project and Dissertation Preparation Seminars

- Industrial Training Project (18 EC) – at Associated Partner
- Research and Communication Skills (6 EC) – Online
- Elective courses (6 EC) – Online
 - Sustainable Mobility Policies
 - Theory and Design of Bridges

SEMESTER 4 - 30 ECTS

Dissertation

At any global (Associated) Partner

ABOUT

The partners



Universiteit Antwerpen

The University of Antwerp (UAntwerp) is a young, dynamic and forward-thinking university with a strong mission and vision. It occupies a special place within the university landscape in Flanders, and it integrates the assets of its historical roots with its ambition to contribute positively to society. Our motto "Let's define the future!" stands for what drives us: bringing positive change and taking on challenges within society. The Faculty of Applied Engineering has approximately 1200 students between the bachelor and master programmes on Engineering Technology. The Joint Master will be supported by the Department of Construction Engineering and the research group SuPAR - Sustainable Pavements and Asphalt Research.



Università degli Studi di Palermo

The University of Palermo (UNIPA) is a consolidated cultural, scientific teaching institute in central-western Sicily. Its 16 Departments cover the most important domains of contemporary scientific and technological knowledge. More than hundred courses (first and second cycle) are yearly offered as well as 44 master and specialization and 23 Ph.D. courses, targeted to the training of specific professional figures, often in cooperation with external institutions and companies. The Joint Master will be supported at the University of Palermo by staff of the study program of Civil Engineering, by the centre for sustainable and ecological transition, the UNIPA doctoral school, the Progetto mentore, and researchers from the SMARTILAB research group.



Universidade do Minho

The University of Minho (UMinho) is a vibrant young Portuguese university. UMinho is an institution recognised for the competence and quality of its professors, the excellence of its research, its wide range of undergraduate and postgraduate courses and its high level of interaction with other institutions. A central player in the region, the University of Minho is an important national reference and a recognised partner on the European and global scene. The Joint Master will be supported at the University of Minho/School of Engineering, by the staff of the Civil Engineering Department and the Institute for Sustainability and Innovation in Structural Engineering.



MANIPAL ACADEMY of HIGHER EDUCATION

(Deemed to be University under Section 3 of the UGC Act, 1956)

Manipal Academy of Higher Education (MAHE) is synonymous with excellence in Higher Education. With more than 28,000 students from more than 65 different nations living and learning in the sprawling University town, nestled on a plateau in Karnataka's Udupi district, located at Manipal, MAHE offers 320 career centric specializations in 29 disciplines and 12 program levels through 39 institutions, schools, centres and departments. MAHE organises PhD programs at Manipal, Mangaluru, Jamshedpur & Bengaluru and off-shore campus in Dubai (UAE).

Campus life & surroundings



The University has approximately 21347 registered students, making it the third-largest university in Flanders. It has 9 faculties and is located on four campus locations in the city centre and in the south of the city. You will be part of a community of more than 1800 foreign students. Not only the university, but also the city Antwerp is a very multicultural place to live with 172 different nationalities. Studying in the heart of Europe will give you the opportunity to visit capitals like Amsterdam, Paris and London easily to reach by train (1h45 to A'dam, 2h32 to Paris, 4h22 to London).

You will learn at one of the best technical universities in Italy. Studying at our university gives you an opportunity to receive thorough education in many fields of study and gain qualifications required by the demanding and fast-changing job market. Situated in the south of Italy, Palermo is an ideal city for students. The cost of living and accommodation is relatively low in comparison with other cities. Also travelling to other parts of Italy, such as Rome, is easy by flight. Palermo is an attractive city. It lies in the picturesque Sicily, offering great opportunities for different forms of active tourism.



The University of Minho has a strong internationalisation policy that is reflected in its main areas of action: teaching, research and innovation, and interaction with society. As a student, you will be thrilled by over 40 different sports that will be offered to you, such as aerobics, weightlifting, athletics, basketball, horseback riding, football, and many more. It's also a fantastic place for surfing. Porto is only 42 km away and you will have the opportunity to visit the wonderful capital, Lisbon.

It's always a great day to be a Manipalian. Living in a coastal city has its perks, but there's a lot more to Manipal than sun and sand. Surf in the Indian Ocean. Hike 3,000-foot western Ghat peaks. Explore ancient cultural cities. It's all within 60 minutes of campus.



ADMISSION REQUIREMENT

A Bachelor's degree with a minimum of 180 ECTS credits in a relevant area that gives immediate access to a Master's programme in the home country is necessary.

Areas of study relevant to this programme include:

- Civil Engineering
- Transportation Engineering
- Construction Engineering
- Material Engineering
- Electromechanical Engineering
- Chemical Engineering

ENGLISH LANGUAGE PROFICIENCY

The programme is taught in English. Candidates are therefore required to demonstrate that they have a good command of English, both spoken and written.

All non-native speakers should have achieved the minimum score specified in one of the following language proficiency tests or similar:

- IELTS (academic version): 6.5 overall, with no sub-test less than 5.5.
- Internet-based TOEFL: 94 overall, with minimum scores of Listening 17, Reading 18, Speaking 20, Writing 17.
- PTE-A (Pearson Test of English-Academic): 60 overall, with no sub-test less than 51.
- UCLES First Certificate in English (FCE), CEFR level B2.

ADMISSION PROCEDURE AND DEADLINES

- Completed online application form and requested documents by 1 March 2026.
- Further applications may be considered by the Admission Board up to 1 June 2026, if seats are still available.
- Acceptance will be conditional upon the availability of places.
- Candidates may be required to attend an interview (either face-to-face or online).
- Acceptance results will be available before 30 March 2026 or 30 June 2026 (for EEA-candidates who applied after 1 March 2026). See website surpave.eu
- Introduction week 14-18 September 2026 (Antwerp).
- Start date: 21 September 2026.
- Online sessions possible till 30 October.

SCHOLARSHIPS

The Consortium is applying for Erasmus Mundus scholarships. The results will be known in summer 2026.

Students without Erasmus Mundus scholarship can apply for other financial support for the 2nd, 3rd and 4th semester.

FEE

Students awarded an Erasmus scholarship, have a fee waiver.

Fee for students without Erasmus Mundus scholarship:

- Students from EU Member States, third countries associated to the Programme and students MAHE: 4500€/year
- Students from third countries not associated to the Programme 9000€/year

ACADEMIC ASSOCIATED PARTNERS

University of Trento, TU Wien, Chongqing Jiaotong University, Unifor, Aristotle University of Thessaloniki, Nagaoka University of Technology, Université Mohammed premier Oujda, University of Nottingham, Wrocław University of Science and Technology, Debre Berhan University, IIT KHARAGPUR, National Institute of Technology (NIT) Calicut, Universidade Federal do Ceará, COPPE-Federal University of Rio de Janeiro, USP-University São Paulo, Universiti Sains Malaysia, Dire Dawa University, Università Telematica Internazionale UNINETTUNO. Changsha University of Science & Technology, Université Gustave Eiffel, University of Twente, Maastricht University, University of Nis, University of New Hampshire.

INDUSTRIAL ASSOCIATED PARTNERS

SWECO, Stadsbader, Agentschap Wegen en Verkeer - Flemish Road Agency, Port of Antwerp-Bruges, Belgian Road Research Centre, Dutch Road Agency, LNEC, MotaEngil, ASCENDI, NRV – Consultores de Engenharia, S.A, VOLO Engineering and Consulting, ITERCHIMICA, AECOM, EIFFAGE Rodovia India Private, Indian Technocrat Limited, DST - Domingos da Silva Teixeira, Marradi Consulting Partners, Infraestructuras de Portugal, Loudon International, Rhoe, ICNet Global, EduNet World Association, ORIS Material Intelligence, Anas Gruppo FS Italiane, Eiffage Infrastructures, RISA, CCG/ZGDV INSTITUTE, Construções Pragosa, S.A.





CONTACT US

All questions have to be sent to



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More information about application on



www.surpave.eu



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PAVEMENT ENGINEERING