Ph.D. programme in Civil Systems Engineering

Sustainable Construction Materials

eng. Rosa Veropalumbo

Credits: 3 CFU
Number of hours: 18 hybrid hours
Date: 26 January, 2, 4, 9, 11 and 17 February 2027

Objectives: The course aims to provide students with some methodological tools for the analysis of data from laboratory tests, with applications respectively in the fields of road flexible pavement construction and maintenance, with focus on the rheological performance and environmental sustainability of asphalt mixtures, alternative to the traditional ones.

Course programme: The course will cover some theoretical elements: extraction and processing of bituminous binders, rheological characterization of bitumen, mix design of sustainable asphalt mixtures (high rate of secondary raw materials and cold production technologies), comparative assessment of innovative asphalt solutions basing on sustainability criteria.

Teaching materials: Lecture notes, presentations and research papers.

Assessment methods: Final presentation of the project work

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Lectures Program

N	Date	Schedule	Duration	Topic
1	26/01/27	10:00 - 13:00	3 hours	Introduction to bituminous binders: origin, processing, binder classification, ageing effect, frequency sweep and multi stress creep and recovery tests.
2	2/02/27	10:00 - 13:00	3 hours	Mix design of asphalt mixtures containing alternative materials: grading curve, indirect tensile strength and stiffness modulus, fatigue cracking.
3	4/02/27	10:00 - 13:00	3 hours	Applications of current research in the field of sustainable materials for the construction of asphalt pavements.
4	9/02/27	10:00 - 13:00	3 hours	Analysis and interpretation of experimental data: exercises.
5	11/02/27	10:00 - 13:00	3 hours	Evaluation tools for the interpretation and comparison of results: preparation of the final project work.
6	17/02/27	10:00 - 13:00	3 hours	Discussion and presentation of the project work of the PhD candidates.

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