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Course unit English denomination Microengineered Systems for Organoids and Organ-on-Chip Models

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SS ING-IND/24

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Teacher in charge Nicola Elvassoree  
(if defined)

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Teaching Hours 12

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Number of ECTS credits allocated 1

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Course period To be defined

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Course delivery method

- In presence
- Remotely
- Blended

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Language of instruction English

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Mandatory attendance

- Yes (80% minimum of presence)
- No

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Course unit contents The course provides an overview of microengineered approaches for creating and studying human organoids and organ-on-chip models. It covers the integration of stem cell biology, biomaterials, and microfluidic technologies to reproduce human tissue development and function in vitro. Topics include design principles of microphysiological systems, the biophysics at microscale, the dynamic control of the cellular microenvironment, and applications in disease modeling, drug testing, and regenerative medicine.

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Learning goals PhD students will have acquired a comprehensive understanding of the engineering principles that underpin organoid and organ-on-chip technologies, with particular attention to how biophysical and biochemical cues guide stem cell self-organization and tissue patterning. They will gain a critical perspective on how microengineered models can be applied to study human development, disease mechanisms, and translational applications in biomedical research. Moreover, students will strengthen their capacity to analyze and evaluate recent scientific literature and technological innovations in this rapidly evolving interdisciplinary field.

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Teaching methods Frontal lectures with interactive discussions and critical analysis of selected scientific papers.

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Course on transversal, interdisciplinary, transdisciplinary skills

- Yes
- No

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Available for PhD students from other courses  Yes Classes are open to doctoral students only in the following courses:  
 No Biosciences

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Prerequisites  
(not mandatory)

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Examination methods  
(if applicable) Evaluation of final presentations

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Suggested readings Teaching materials

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Additional information

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PhD in Biomedical Sciences