



Course unit English denomination	Catalysis from small molecule activation to complex supramolecular systems
Teacher in charge (if defined)	SARTOREL Andrea, RIGODANZA Francesco, ROSA-GASTALDO Daniele
Teaching Hours	24
Number of ECTS credits allocated	3
Course period	09/2025
Course delivery method	<input checked="" type="checkbox"/> In presence <input type="checkbox"/> Remotely <input type="checkbox"/> Blended
Language of instruction	English
Mandatory attendance	<input checked="" type="checkbox"/> Yes (75 % minimum of presence) <input type="checkbox"/> No
Course unit contents	The course will focus on the most recent developments of catalysis for small molecule activation and for organic synthesis via complex supramolecular systems. Fundamentals on the activation of oxygen, reactivity of C-H bonds, and thermochemistry of carbon dioxide will be initially given. Attention will be then given to photosynthetic catalysis, in particular to multiphoton redox catalysis on small single molecules and how catalytic properties can be tuned spanning from single molecule to complex supramolecular assemblies, including potential applications and implications for catalytic design. Participants will gain a comprehensive understanding of the mechanisms and innovative approaches employed in these catalytic processes.
Learning goals	Students will be able to: Knowledge: acquire the scientific knowledge and tools related to catalysis Skills: apply critical thinking and analytical skills to interpreting scientific articles on catalysis; Competencies: demonstrate oral presentation skills to communicate science related to the argument of the course
Teaching methods	Frontal teaching
Course on transversal, interdisciplinary, transdisciplinary skills	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Available for PhD students from other courses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Students external to the PhD Course admitted upon evaluation of the CV by the teachers



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Prerequisites  
(not mandatory)

None

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Examination  
methods

Presentation by the student on a literature research article dealing with the  
topic of the course.

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Study material

Slides/articles provided by the teacher

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Additional  
information  
(not mandatory)

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