

Teaching plan - PhD programme in Chemical, Geological and Environmental Sciences

39°Cycle a.y. 2023/2024

Course	Teacher(s)	SSD	hrs	credits	Educational form*	Type of activity**	
Science: Observation and Prejudice	Eduardo Garzanti	GEO/02	8	1	Lecture	Intercurricular	Chosen activity
Communication of Climate Change	Claudia Pasquero	GEO/12	8	1	Lecture	Intercurricular	Chosen activity
The Climatic Role of Atmospheric Aerosol in the Arctic	Luca Ferrero	CHIM/12	8	1	Lecture	Intercurricular	Chosen activity
Ice Core Science	Barbara Delmonte	GEO/04	8	1	Lecture	Intercurricular	Chosen activity
Scanning and Transmission Electron Microscopy, Principles and Applications	Giancarlo Capitani, Paride Mantecca, Giovanni Maria Vanacore,	GEO/06	28	3	Lecture & laboratory training	Intercurricular	Chosen activity
Raman Spectroscopy: A Flexible Tool for an Integrated Research Approach	Sergio Andò, Maria Luce Frezzotti	GEO/02	16	2	Lecture	Intercurricular	Chosen activity
Scanning Probe Microscopy: Principles, Applications, and Image Handling	Marcello Campione	FIS/01	12	1	Laboratory training	Intercurricular	Chosen activity

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Sustainable Chemical Processing Technologies	Heiko Lange, Luca Zoia	CHIM/06	16	2	Lecture	Intercurricular	Chosen activity
New Lignin-Based Sustainable Materials: Science and Technological Aspects	Luca Zoia, Ruggero Barni	CHIM/06	8	1	Lecture	Intercurricular	Chosen activity
Critical Raw Materials and Their Environmental Impact	Alessandro Cavallo	GEO/09	16	2	Lecture	Intercurricular	Chosen activity
Isotopes as Environmental Tracers	Barbara Leoni, Marco Rotiroti	BIO/07	20	2	Lecture & laboratory training	Intercurricular	Chosen activity
Enhancement of Fragile Cultural Heritage	Ezio Bolzacchini, Chiara Rostagno, Luca Ferrero	CHIM/12	20	2	Lecture & laboratory training	Intercurricular	Chosen activity
Machine Learning for Multivariate Data Analysis	Davide Ballabio	CHIM/01	20	2	Lecture & laboratory training	Intercurricular	Chosen activity

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Open-Source Software for Spatial Data Analysis	Micol Rossini	GEO/04	16	2	Lecture	Intercurricular	Chosen activity
Spatial Variability of Environmental Characteristics and Mapping Methodologies	Chiara Ferrè	AGR/14	16	2	Lecture	Intercurricular	Chosen activity
Time Series Analysis of Environmental Data	Tullia Bonomi	GEO/05	20	2	Lecture & laboratory training	Intercurricular	Chosen activity
Advanced Techniques for Sample	Veronica Termopoli, Fabio Gosetti	CHIM/01	16	2	Lecture	Chemistry Curricular	Mandatory activity
NMR spectroscopy applications to ligand-receptor studies	Cristina Airoidi	CHIM/06	20	2	Lecture	Chemistry Curricular	Chosen activity
NMR spectroscopy of molecular Inorganic and Organometallic Compounds	Roberto Della Pergola	CHIM/03	8	1	Lecture	Chemistry Curricular	Chosen activity
Advanced Theoretical Chemistry	Piercarlo Fantucci	CHIM/03	16	2	Lecture	Chemistry Curricular	Chosen activity
Crystallography and Laboratory of X-ray powder diffraction	Massimo Moret, Chiara Ferrara	CHIM/03, CHIM/02	20	2	Lecture & laboratory training	Chemistry Curricular	Chosen activity

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Introduction to photochemistry	Luca Bertini, Claudio Greco, Antonio Papagni	CHIM/02, CHIM/03, CHIM/06	24	3	Lecture	Chemistry Curricular	Chosen activity
Detrital geochronology and thermochronology	Igor M. Villa, Marco G. Malusà	GEO/02	16	2	Lecture	Geology Curricular	Chosen activity
Provenance analysis: how to integrate single grain and bulk techniques	Sergio Andò, Alberto Resentini	GEO/02	16	2	Lecture	Geology Curricular	Chosen activity
Fluids in the Earth	Robert Bodnar, Maria Luce Frezzotti, Rosario Esposito	GEO/07	16	2	Lecture	Geology Curricular	Mandatory activity
Monte Carlo Approach to Geophysical Inverse Problem: An Introduction	Nicola Piana Agostinetti	GEO/11	20	2	Lecture & Laboratory training	Geology Curricular	Chosen activity
Advanced Field and Remote-Sensed Characterization of Rock Fractures in Outcrops	Federico Agliardi, Andrea Bistacchi	GEO/05	18	2	Lecture & Laboratory training	Geology Curricular	Chosen activity
Introduction to geodynamic and landscape evolution numerical modeling	Pietro Sternai	GEO/03	20	2	Lecture, computer work	Geology Curricular	Chosen activity

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UAV/ROV and Immersive Virtual Reality for Research in Earth Sciences	Fabio Luca Bonali, Luca Fallati	GEO/03	18	2	Lecture & Field activity	Geology Curricular	Chosen activity
Geoenergy and Geomechanics	Giovanni Battista Crosta, Riccardo Castellanza	GEO/05	16	2	Lecture	Geology Curricular	Chosen activity
Advanced Experimental Testing and Monitoring on Geomaterials	Giovanni Battista Crosta, Riccardo Castellanza	ICAR/07	20	2	Lecture & Laboratory training	Geology Curricular	Chosen activity
Geotechnical Modelling for Slope Stability and Underground Geostructures	Giovanni Battista Crosta, Riccardo Castellanza	ICAR/07	20	2	Lecture & Laboratory training	Geology Curricular	Chosen activity
Native Plant Assemblages to Restore Degraded Lands	Sandra Citterio, Rodolfo Gentili	BIO/01	8	1	Lecture	Environment Curricular	Chosen activity
Non-Animal Testing and Research: Ethical Issues and Scientific Applications	Chiara Urani	BIO/06	8	1	Lecture	Environment Curricular	Chosen activity
Ecological Baseline and Conservation Paleobiology	Daniela Basso, Valentina Bracchi	GEO/01	16	2	Lecture	Environment Curricular	Chosen activity

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Next Generation Sequencing and Bioinformatic Tools for Ecological Studies	Andrea Franzetti, Isabella Gandolfi	BIO/19	20	2	Lecture & Laboratory training	Environment Curricular	Chosen activity
Advanced Human Ecology	Emilio Padoa-Schioppa	BIO/07	16	2	Lecture	Environment Curricular	Chosen activity
Ecosystem Services	Emilio Padoa-Schioppa	BIO/07	16	2	Lecture	Environment Curricular	Chosen activity
Acoustics Applied to the Environment: Soundscape as Environmental Quality Index	Ecosystem services	FIS/07	8	1	Lecture	Environment Curricular	Chosen activity
39			616	70			