UNIVERSITÀ DEGLI STUDI DI CAGLIARI

PhD Programme in **EARTH AND ENVIRONMENTAL SCIENCES AND TECHNOLOGIES** Curriculum 1: GEOLOGICAL EVOLUTION OF THE TERRITORY Curriculum 2: APPLIED GEOLOGY AND ENVIRONMENTAL TECHNOLOGIES Curriculum 3: GEOSPHERE-BIOSPHERE INTERACTION	
DISCIPLINARY SCIENTIFIC AREAS	03 - CHEMICAL SCIENCES; 04 - EARTH SCIENCES; 05 - BIOLOGICAL SCIENCES; 07 - AGRICULTURAL AND VETERINARY SCIENCES; 08 - CIVIL ENGINEERING AND ARCHITECTURE
COORDINATOR	PROF. GABRIELE CRUCIANI
HEAD DEPARTMENT	DEPARTMENT OF CHEMICAL AND GEOLOGICAL SCIENCES
DURATION	3 YEARS
LEARNING OUTCOMES AND RESEARCH TOPICS	The PhD programme in Earth and Environmental Sciences and Technologies promotes in-depth, extensive knowledge of the territory and its natural resources, as well as protection of the natural environment in biotic and abiotic aspects. At the international level, these are considered primary targets, in particular by the European Union, with special reference to the Mediterranean area. The preservation and protection of the natural environment is a strategic issue for regional economy, evolution of the territory and sustainable development. Every world region, area and environment is characterized by its peculiar critical aspects, which are influenced by the specific geological-geomorphological setting, climate, and ecosystems and socio-economic activities. The effects of these criticalities can cause environmental and, consequently, socio-economic imbalance, decreasing the potential for regional development. Addressing and solving these issues require in-depth knowledge on the evolution of natural environments, and on the impact of human activities. The doctoral programme supports research on new technologies, applications, and nature-based solutions as innovative tools for monitoring and protecting the natural environment. Rational exploitation and recycling of resources, in a context of circular economy, are also primary objectives. The qualifying cultural core of the training project is represented by an integrated, and interdisciplinary approach applied from molecular to ecosystem scale. It is aimed to the study of the territory as a physical and natural environment, with emphasis on the development and application of new technologies and approaches to environmental conservation. Connecting and integrating basic and applied, abiotic and biotic disciplines, is promoted throughout the entire doctoral programme in line with current international research trends. The PhD programme includes short courses and seminars, internships and training stages in Italian and foreign research institutions and encourages participation in national and international conferences. Acquiring independent research skills and sharing research results through publication in international scientific journals is also a primary learning outcome. For Cycle XXXVIII, the PhD Board has identified the following topics as research priorities, though not exclusive: Curriculum n. 1 (Geological evolution of the territory) includes research topics typical of the basic disciplines within the Earth Sciences: Regional Geology, Geomorfology, Mineralogy, Palaeontology, Petrology, Sedimentology, Stratigraphy, Tectonics, Vulcanology, genesis and

	prospection of mineral resources. These main research topics are finalized to the knowledge, evolution and mapping of the territory and its resources. Curriculum n. 2 (Applied geology and environmental technologies) involves research in the field of Applied Geology and Environmental Sciences and Technologies, even in the context of circular economy. Leading themes are: characterization and decontamination of contaminated sites, mineral resources exploitation, protection of water resources, soil, environment and cultural heritage defence, climate change, remote sensing, management and treatment of waste materials, waste substances and gaseous emissions. Curriculum n. 3 (Geosphere-biosphere interaction) includes research activities in Botany, Pedology, Mineralogy, and, more in general, all those disciplines investigating the interactions between geosphere and biosphere, finalized to environmental preservation and restoration throughout the protection of endemic flora and agrodiversity. Main themes: plant systematics, environmental botany, physiological processes of plants at the soil/atmosphere interface, such as photosynthesis and transpiration, rhizobiology including secondary metabolites of plants, biogeochemical dynamics of soil-plant-atmosphere systems, plant ecophysiology, biominerals, palaeo and archaeobotany.
ELIGIBILITY AND OTHER REQUIREMENTS FOR CANDIDATES (ART. 2 - NOTICE OF COMPETITION)	EVERY ITALIAN 2ND CYCLE DEGREE (*LAUREA MAGISTRALE/SPECIALISTICA/VECCHIO ORDINAMENTO*) AND EQUIVALENT AND SUITABLE FOREIGN ACADEMIC DEGREES Adequate knowledge of scientific English; basic computer skills (word processing programs, spreadsheets, databases and GIS) Foreign candidates: Degrees equivalent to those mentioned above; adequate knowledge of Italian or English and, in any case, scientific English; basic computer skills (word processing programs, spreadsheets, databases and GIS).
ADMISSION TESTS	ASSESSMENT OF QUALIFICATIONS AND CURRICULUM VITAE, WRITTEN TEST AND VIDEO CONFERENCE INTERVIEW. The written test will focus on some specific aspects, feasibility, etc., of the research project. The interview will be conducted by video conference with audio and video modality that allows the verification of the identity of the candidate. The interview will be aimed at verifying the candidate's ability to orient herself/himself on the main fields of study related to the Doctorate and to verify her/his analytical and communication skills. The interview will be conducted, at the request of the candidate, also in English. During the interview, the candidate will discuss his/her 3-year research project. The project (preferably written in English) must be uploaded along with the documents listed in art. 3 of the PhD notice of competition (Annex A “Titoli valutabili e Curriculum Vitae’; Annex B ‘Dichiarazione sostitutiva di certificazioni del/i titolo/i di accesso con esami e voti’; two-sided coloured scanned copy of a valid ID, with a clear photo), within the deadline (file name: progetto_di_ricerca_surname_name - formatting requirements: min. 8,000 max 16,000 characters including spaces - excluding title, schemes, charts and bibliographic references). The project will be evaluated during the interview exclusively and must include: i) purpose of the proposed research project and the related curriculum - Geological evolution of the territory; Applied geology and environmental technologies; Geosphere-biosphere interaction - also specifying the

	disciplinary sector of reference; ii) state of the art of research; iii) detailed workplan; iv) expected results; v) motivation letter, i.e. max. 1,000 characters (including spaces) explaining the reasons prompting the candidate to apply for the PhD Programme. The research project will not be evaluated for admission to the oral exam. During the interview, the candidate's language skills in English will be assessed by reading and translating a passage from a text proposed by the Evaluation Committee.
ADMISSION TESTS FOR FOREIGN CANDIDATES APPLYING FOR RESERVED POSITIONS SUPPORTED BY A SCHOLARSHIP	ASSESSMENT OF QUALIFICATIONS AND CV, VIDEO CONFERENCE INTERVIEW The candidates must upload, within the deadline indicated in the notice, the application material, that must include: the documents required in art. 3 of the notice of competition (certificate attesting the award of a 2nd level foreign degree needed to access a PhD programme, including exams and marks, with a translation in Italian or English; certificate attesting the award of a 1st level foreign degree, including exams and marks, with a translation in Italian or English; signed Curriculum Vitae preferably in EU format, in English or Italian; up to 3 reference letter(s), in English or Italian, on institutional letterhead paper, dated and signed by a university professor or expert in the PhD scientific area(s), following the prescriptions of each annex; additional qualifications, certifications, publications (up to 5) and work experiences, detailed in English or in Italian; two-sided coloured scanned copy of a valid ID, with a clear photo), motivation letter, i.e. max. 1,000 characters (including spaces) explaining the reasons prompting the candidate to apply for the PhD Programme within the deadline (file name: personal_statement _surname_name). Reference letters (up to 3) must be written in English, using the form available on the webpage https://unica.it/dottoratiricerca (How to apply for PhD selection: Guidelines and forms- Annex C), by a university professor or an expert in the research fields of the PhD programme, on letterhead of their institution, dated and signed. Evaluators will send their letters directly to the email address phdcall_referenceletter@unica.it (object: surname and name of the candidate being evaluated and name of the PhD programme for which he/she is applying). The interview will be conducted by video conference with audio and video modality that allows the verification of the identity of the candidate. The interview will be in English and will: - verify the candidate's capacity of orientating among the main study fields of the PhD programme; - assess the candidate's methodological knowledge and his/her analytical, elaboration and communicative skills; - discuss with the Selection Committee the content of a research project.
POSITIONS	6
SCHOLARSHIPS	4 funded by MUR PL, 1 of which reserved for foreign candidates with a degree awarded abroad 1 co-funded by CNR-IRPI - National Research Council (CNR) - Research Institute for Geo-Hydrological Protection (IRPI) Perugia, and the Dept. of Chemical and Geological Sciences. Research topic: *Study of surface instability phenomena in areas affected by fires, through the use of remote sensing techniques and ground surveys* (Contact person: Dott.ssa Maria

	Teresa Brunetti)
POSITIONS WITHOUT SCHOLARSHIP	1
CONTACT PERSON	PROF. GABRIELE CRUCIANI EMAIL: gcrucian@unica.it - TEL. + 39 0706757709
WEBSITE	http://dottorati.unica.it/stta/