



General information	
Academic subject	<i>Geology and cartography of the Quaternary Module of the Integrated Course: "Quaternario Geology and thematic cartography" (12 CFU)</i>
Degree course	<i>Master Degree</i>
Academic Year	<i>2021-2022</i>
European Credit Transfer and Accumulation System (ECTS)	<i>6</i>
Language	<i>Italian</i>
Academic calendar (starting and ending date)	<i>01.03.2022; 15.06.2022</i>
Attendance	<i>Strongly recommended</i>

Professor/ Lecturer	
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Virtual headquarters	
Tutoring (time and day)	<i>By appointment using email address</i>

Syllabus	
Learning Objectives	<i>The objective of the course falls fully within the scope of the Degree Course, which among other things: "... aims to provide an in-depth knowledge of Nature, with its biotic and abiotic components and their interactions, with particular reference to their effects on ecosystems.... Particular attention will be paid to anthropic activities with the greatest impact on natural systems as well as to technologies to solve environmental problems. ... The geological disciplines will provide the knowledge of the dynamics of the geological processes of the most recent history of the evolution of the Earth and the tools for the assessment and management of natural resources and geological risks in the marine and terrestrial environment, as well as the skills for mapping thematic charts... "</i>
Course prerequisites	<i>Basic knowledge of Geology, in particular: textural and compositional features of sedimentary rocks, stratigraphy notions, chronostratigraphic and geochronological subdivision of time, reading geological maps.</i>
Contents	<i>The course consists of 4 credits of frontal lessons and 2 of exercises that include exercises in the classroom and exercises on the field carried out during the excursions. The topics covered during the lectures are: The Quaternary: main aspects; stratigraphic units of the Quaternary; chronology of the Quaternary; the components of the climate system (oceans, atmosphere, vegetation, glaciers, emerged lands ...); climatic variations at various scales and their effects on terrestrial and marine environments; archives of the environment and climate of the past; the proxies of the environment and the climate of the past; internal and external control factors; the quaternary glaciations (duration and chronology); sea level changes: causes and effects; causes of cyclicity in the Quaternary stratigraphy; Milankovitch's hypotheses; formation of continental and marine Quaternary deposits; geological evolution of Italy during the Quaternary; practical relevance of Quaternary research; main methods of investigation and dating used in the Quaternary; case-study of Quaternary deposits in the Metaponto area. During classroom exercises, the following will be performed: photointerpretations of Quaternary deposits; reading of geological maps. During</i>



	<i>field exercises, descriptions of the facies of Quaternary deposits will be made.</i>
Books and bibliography	<i>Some chapters of "Quaternary environments" – Williams, Dunkerely, Deckker, Kershaw, Chappel.</i>
Additional materials	<i>The text must be integrated with the slides made available to the teacher in .pdf format, with some web pages and scientific articles suggested by the teacher during the lessons.</i>

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
150	32	35	83
ECTS			
6	4	2	
Teaching strategy		<i>Lectures supported by PPT presentations, audiovisuals, field exercises, classroom exercises, stereoscopy laboratory exercises.</i>	
Expected learning outcomes			
Knowledge and understanding on:		<i>The student will have to know the main geological processes that took place during the Quaternary and the global and local factors that conditioned them; the hypotheses about the causes of climatic variations in the Quaternary; the main methods of dating Quaternary sediments; the Quaternary evolution of the chain-foreland-foredeep system; the methods to represent and describe Quaternary deposits. This knowledge will be acquired through theoretical lessons. The level of knowledge achieved and the command of the fundamental concepts will be verified through the discussion of the studied topics during the oral exam.</i>	
Applying knowledge and understanding on:		<i>The student will have to acquire the ability to apply the knowledge learned during the course necessary for: the description of the main climatological components and the causes of climate changes, the description and genesis of Quaternary deposits as well as their cartographic representation. The verification of the acquired competences will be carried out through exercises carried out in the classroom and in the field, and through the realization of a written report relating to a thematic mapping project, concerning both modules of the course.</i>	
Soft skills		<ul style="list-style-type: none"> <i>Making informed judgments and choices</i> <i>The student will have to acquire the ability to: derive the limits of Quaternary deposits from aerial photos; derive characters of facies in outcrop; critically read geological maps with Quaternary deposits. The achievement of this objective will be verified on the basis of the results obtained in the exercises carried out in the classroom and in the field, as well as during the oral exam during which he will be carry out reading of geological maps and will discuss the aforementioned written report.</i> <i>Communicating knowledge and understanding</i> <i>The student will have to acquire the ability to expose the fundamental concepts of the studied themes and to describe the main methodologies applied to Quaternary geology with clarity and language properties; he must be able to work independently and / or in teams. The verification of these abilities will be</i> 	



	<p>evaluated both on the basis of the way he relates to others students in group work during the exercises, and on the basis of the explanation methods shown during the oral examination.</p> <ul style="list-style-type: none"> • <i>Capacities to continue learning</i> The student must be able to grasp the links between the various subjects of the course and those of other subjects of the Degree Course. The level reached in this capacity will be verified both through the discussion of the studied topics during the examination, and through the elaboration of a written report mentioned above.
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Assessment and feedback	
Methods of assessment	<p>The examination of the module of "Geology and Cartography of the Quaternary" will be integrated with that of the module of "GIS and Naturalistic Thematic Cartography". The "Geology and Cartography of the Quaternary" exam consists of an oral test in which the student will have to demonstrate knowledge of the topics covered in the course, will be able to read and comment geological maps, and will have to present a written report that will have developed on a thematic mapping project, related to both modules of the course.</p>
Evaluation criteria	<ul style="list-style-type: none"> • <i>Knowledge and understanding</i> The student will have to demonstrate to know the fundamental concepts of Geology and Cartography of the Quaternary, and to have understood the main mechanisms of climatic variations and the formation of Quaternary sediments. He will also have to know the elements of cartographic representation of the Quaternary deposits, having understood their meaning. Understanding and possessing these fundamental concepts is a necessary condition for passing the exam (passing and final marks are conditioned by the integration with the exam of "GIS and Naturalistic Thematic Cartography"). • <i>Applying knowledge and understanding</i> The student must be able to use the basic knowledge acquired to describe the geological phenomena that occurred during the Quaternary and to make a critical reading of geological maps including Quaternary deposits. Mastery of these skills is a necessary requisite for passing the exam (passing and final marks are conditioned by the integration with the exam of "GIS and Naturalistic Thematic Cartography"). • <i>Autonomy of judgment</i> The student must be able to solve a geological question related to the topics of the course, making the most appropriate methodological choices for solving the problem. The demonstration of having a good autonomy in this field will contribute to a more than positive evaluation of the final exam (passing and final grade are conditioned by the integration with the exam of "GIS and Naturalistic Thematic Cartography"). • <i>Communication skills</i> The student must be able to describe clearly and with language properties all the topics covered during the course. He will also need to be able to dialogue and relate to other students. Shortcomings in the possession of these skills will result in a penalty in the final judgment (passing and final marks are conditioned by the integration with the exam of "GIS and Naturalistic Thematic Cartography"). • <i>Capacities to continue learning</i> The student must be able to acquire further knowledge independently starting from the base of the contents transmitted during the course, and making connections with other subjects of the Degree Course. The demonstrated ability



	<i>to autonomously enrich one's own knowledge will contribute to a more than positive evaluation of the final exam (passing and final grade are conditioned by the integration with the exam of "GIS and Naturalistic Thematic Cartography").</i>
Criteria for assessment and attribution of the final mark	<i>Passing and final grade are conditioned by the integration with the "Geology and Cartography of the Quaternary" module. The exam is unique: the final mark is awarded out of thirty, with the possible achievement of honours. The final exam is passed when the grade is greater than or equal to 18.</i>
Additional information	