



General information	
Academic subject	<b>Geomorphology of coastal systems</b>
Degree course	<b>Corso di Laurea Magistrale Interclasse in Scienze della Natura e dell'ambiente</b>
Academic Year	I year II half
European Credit Transfer and Accumulation System (ECTS)	3+1
Language	<i>Italian (slides in English)</i>
Academic calendar (starting and ending date)	19.4.2022-17.5.2022
Attendance	Strongly recommended

Professor/ Lecturer	
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Virtual headquarters	TEAM 3poiù6e
Tutoring (time and day)	All days by appointment

Syllabus	
<b>Learning Objectives</b>	The aim is to train the graduate in such a way that he can analyze the coastal space, identify emergencies in its dynamics, define a study plan, determine possible dynamic scenarios and intervention priorities.
<b>Course prerequisites</b>	The achievement of the educational objectives requires, on the part of the student, the knowledge acquired in the field of geological subjects (Physical Geography and Geology) and ii) generic skills in basic scientific subjects (Physics and Biology). Working students must possess these prerequisites in a similar way to those attending ones.
<b>Contents</b>	<p>Introduction (4 hours) Definition of Geomorphology. Definition of coastal area. The coastal environment and the coastal landscape. Coastal morphogenetic systems and coastal morphoclimatic systems.</p> <p>Coastal systems dynamics (6 hours) Sea level. The concept of energy balance and mass balance. Coastal morphogenetic processes. Tidal waves and currents.</p> <p>Coastal classification (8 hours) Rocky coasts: high, low and cliff Coastal mobile systems: beach, dune, retrodune area Delta systems: delta and estuary Tidal systems: tidal flats Coral reefs; barrier reef, fringing reef.</p> <p>Investigation methods (6 hours) The use of laser scanners, DGPS, lidar, multibeam, sidescan sonar, SBP, geoelectric and terrestrial seismic, penetrometer.</p> <p>External Laboratory (15 hours) Applications of surveys techniques</p>
<b>Books and bibliography</b>	Scientiphic book



	<p>Bird E. (2011). Coastal Geomorphology. John Wiley &amp; Sons, Chichester UK. 436 pp</p> <p>Pranzini E. (2004). La forma delle coste: geomorfologia costiera impatto antropico e difesa dei litorali. ZAnichelli, 235 pp.</p> <p>Surace L., Milli M. (2011). Le linee della costa. Definizioni, riferimenti alimetrici e modalità di acquisizione dei dati. Alinea Editrice, 80 pp</p> <p>Woodroffe C.D. (2003). Coasts: Form, Process and Evolution. Cambridge University Press, 623 pp.</p> <p>The texts indicated are the reference material for studying during the course and for taking the exam. The sitography instead introduces the student to the consultation of bibliographic sources and online resources regarding coastal dynamics.</p>
<b>Additional materials</b>	<p>Technical material</p> <p>APAT (2007). Atlante delle opere di sistemazione costiera. <a href="http://www.isprambiente.gov.it/it/pubblicazioni/manuali-e-linee-guida/atlante-delle-opere-di-sistemazione-costiera">http://www.isprambiente.gov.it/it/pubblicazioni/manuali-e-linee-guida/atlante-delle-opere-di-sistemazione-costiera</a></p> <p>APAT (2014). Strategie di intervento per la difesa del mare e delle zone costiere dagli inquinamenti accidentali da idrocarburi e da altre sostanze nocive. <a href="http://www.isprambiente.gov.it/it/pubblicazioni/quaderni/ricerca-marina/quaderni-delle-emergenze-ambientali-in-mare/leadImage/image_view_fullscreen">http://www.isprambiente.gov.it/it/pubblicazioni/quaderni/ricerca-marina/quaderni-delle-emergenze-ambientali-in-mare/leadImage/image_view_fullscreen</a></p> <p>ISPRA (2014). Linee guida per gli studi ambientali connessi alla realizzazione di opere di difesa costiera. <a href="http://www.isprambiente.gov.it/files/pubblicazioni/manuali-lineeguida/MLG_105_14_finale.pdf">http://www.isprambiente.gov.it/files/pubblicazioni/manuali-lineeguida/MLG_105_14_finale.pdf</a></p>

<b>Work schedule</b>			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
<b>Hours</b>			
100	24	15	61
<b>ECTS</b>			
4	3	1	
<b>Teaching strategy</b>			
<p><i>The transfer of theoretical notions related to coastal geomorphology takes place through the commentary and joint discussion of slides and scientific publications that remain available to students, as well as with the discussion and resolution of complex problems.</i></p>			
<b>Expected learning outcomes</b>			
<b>Knowledge and understanding on:</b>	<p><i>Acquisition of knowledge for the study of the coastal physical landscape, its evolution and its dynamics. Acquisition of the essential basic concepts of coastal geomorphology through: i - the classification and definition of physical genetic processes in relation to the biological components of coastal landforms; ii - the recognition, identification and nomenclature of the landforms of the coastal landscape; iii - understanding and knowledge of the coastal landforms dynamics. This will be achieved through theoretical lessons.</i></p> <p><i>Particular attention will be paid to: i - the correlation of the different</i></p>		



	<p><i>processes for the definition of the coastal landscape and its components; ii - the definition of the different morphogenetic and morphoclimatic systems existing on the globe; iii - the interactions of physical processes with anthropic activity.</i></p>
<b>Applying knowledge and understanding on:</b>	<p><i>Acquisition of knowledge regarding the applicative features of geomorphology in the context of integrated coastal zone management (ICZM). This will happen through discussion of case studies with the teacher or in work groups and during the external laboratory activities</i></p>
<b>Soft skills</b>	<p><i>Autonomy of judgment</i></p> <p><i>Based on the theoretical lessons and the exposure of cases discussed during the external laboratory, the student will acquire the critical ability with respect to the knowledge available in order to achieve: i - the classification and cartographic representation of coastal forms and processes, ii - the problem solving for the purpose of implementing knowledge with the identification, recognition, evaluation and formulation of interventions aimed at planning a geomorphological study, including an application that is capable of providing answers and solutions to stakeholders and decision makers</i></p> <p><i>Communication skills</i></p> <p><i>Participation in discussion groups of case studies for the acquisition of the ability to: i - written and graphic presentation of fundamental principles and concepts specific to the study themes; ii - description of the techniques and procedures for data acquisition, processing and interpretation with clarity and language properties.</i></p> <p><i>Learning ability</i></p> <p><i>Acquisition of the ability to deepen the understanding of geomorphological concepts by developing autonomous reasoning aimed at identifying the links and differences between the various topics of the course of study also on the basis of knowledge resulting from previous courses. This will happen through discussion of case studies with the teacher or in work groups</i></p>
<b>Assessment and feedback</b>	
Methods of assessment	<p><i>The student's assessment includes an oral test. The score of the exam is attributed by means of a mark expressed out of thirty.</i></p>
Evaluation criteria	<p><b>Ability to apply knowledge and understanding</b></p> <p>The student is called to apply the theoretical aspects acquired to regional case studies.</p> <p><b>Autonomy of judgment</b></p> <p>The student is able to independently identify a logical path between causes and effects in the evolutionary dynamics of the coastal landscape. The student demonstrates his ability to make the choice of methodological approaches suitable for describing / solving processes / problems related to coastal dynamics.</p> <p><b>Communication skills</b></p> <p>The student must have acquired the ability to fully communicate the concepts learned and to use correct scientific language.</p> <p><b>Learning ability</b></p>



	The student must demonstrate that he has acquired the tools to enrich his knowledge also through the individual and group study paths proposed during the course.
Criteria for assessment and attribution of the final mark	<i>The final evaluation of the student will take into account: i) the student's participation in the external laboratory; ii) the preparation of the related documents; iii) of participation in working groups. An excellent grade is the result of meeting most of the evaluation criteria listed above.</i>
<b>Additional information</b>	