Main course information		
Academic subject	GIS and Naturalistic Thematic Cartography i.c.	
Degree course	Laurea Magistrale in Scienze della Natura e dell'Ambiente	
Classe di laurea	LM-60 & LM-75	
ECTS credits (CFU)	6	
Compulsory attendance	strongly recommended	
Teaching language	Italian	
Accademic Year	2019/2020	

Docente responsabile	
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Tutorial time/day	Monday at 10 am or by e-mail appointment

	Study area	SSD code	Type of class
Course details	Earth science disciplines	GEO/04	Lecture/workshop

Teaching schedule	Year	Semester
reacting schedule		II

Modalità erogazione	CFU/ECTS	Lessons (hours)	CFU/ECTS lab	Lab hours	CFU/ECTS tutorial/workshop	Tutorial/workshop hours	CFU/ECTS field trip	Field trip Hours
	3	24	0	0	3	45	0	0

Time	Total hours	Teaching hours	Self-study hours
management	150	69	81

Academic	First lesson	Final lesson
Calendar	02.03.2020	05.06.2020

Syllabus			
Course entry requirements	Adequate knowledge of the ecosystem as a whole		
Expected learning outcomes (ac	cording to Dublin Descriptors) (it is recommended that they are congruent with the		
learning outcomes contained in	A4a, A4b, A4c tables of the SUA-CdS)		
Knowledge and understanding	Knowledge of methods for the environment analysis and of criteria to representing landscape data; definition of the environment elements by reading maps at different scales; knowledge of the tools and of the map-making process		
Applying knowledge and understanding	Analyzing the environment and all its components; geoprocessing of different data and problem solving; ability to represent the data processing results		
Making informed judgements and choices	Collect and process geo-naturalistic data, interpret them in an interdisciplinary perspective and show them on a map		
Communicating knowledge and understanding	Ability to clearly display and map the analysis results and ability to interact with other specialists		
Capacities to continue learning	Acquisition of understanding and deepening the contexts with a critical skill ability and of applying the method of analysis in increasingly complex situations ability		

Sylabus	
Course content	The Thematic maps; the indispensable elements of maps. Elements of geodesy: the Geoid; parameters and definition of the Ellipsoid; the reference systems; the trigonometric network and the IGM95 network; the Datum; the coordinates; projection systems

	The Geographic Information System; use of GIS; spatial data models; vector data and raster data; the topology; GIS tools; data input. History of Numerical Cartography; GIS open source and proprietary; internet mapping, WebGIS and OGC services. Editing process and features creation; the attributes tables, unions between tables, the graphs. Georeferencing procedure; projections storage. The Geodatabase; querying a database; search and identify elements; measure distances; the selections. Geoprocessing of vector and raster data; resampling; Map Algebra and Raster Calculator. Surface creation; digital elevation models (DEMs); topographic analysis; delineation of the hydrographic network. Data presentation: map creation; the elements of a map, grids and rulers; the reference system; the templates; exporting a map. 3D data visualization; 3D shapefiles; the TIN layer; 3D scene properties; the elevation profile
Course books/Bibliography	Dainelli N. et alii, 2008 - Cartografia numerica - Manuale pratico per l'utilizzo dei GIS. Dario Flaccovio Editore Noti V. 2014 – GIS Open Source per la geologia e l'ambiente. Dario Flaccovio Editore Brewer C. A., 2016 – Designing better maps. Esri press. Bosellini A., Cavattoni T., Fantini F. 2009 - Corso di Scienze del Cielo e della Terra, Oltre il libro, III Cartografia. Italo Bovolenta Editore (on line)
Notes	Supplement by web documentations, especially in solving exercises. The PowerPoint presentation of the lessons are available as support
Teaching methods	Classroom-taught lessons by PowerPoint presentation, teaching support with on-line data, exercises about geo-naturalistic cases by using data of national and regional online database, classroom discussion
Assessment methods (indicate at least the type written, oral, other)	The examination of the module of "GIS and Naturalistic Thematic Cartography" will be integrated with that of the "Geology and Cartography of the Quaternary" module. It consists in the discussion of the candidate report about a GIS project on naturalistic and/or geological data and the related thematic map showing the result of the analysis. It continues with an oral interview on theory arguments
Evaluation criteria (Explain for each expected learning outcome what a student has to know, or is able to do, and how many levels of achievement there are Further information	The student will have to demonstrate: a good ability in defining the environment elements and in representing them in an adequate way, a good problem solving ability both in the analysis of the territory and in the GIS geoprocessing, a good capacity for cartographic representation of the analysis results. The enrichment of the student's knowledge will also be demonstrated by the ability to evaluate his own work. Overcoming and final grade are conditioned by the integration with the "Geology and Cartography of the Quaternary" exam.