UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze della Terra e del Mare		
ACADEMIC YEAR	2022/2023		
MASTER'S DEGREE (MSC)	GEORISK AND GEORESOURCES		
INTEGRATED COURSE	ADVANCED GIS APPLICATIONS - INTEGRATED COURSE		
CODE	22463		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	GEO/04		
HEAD PROFESSOR(S)	CONOSCENTI CHRISTIAN	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	MARTINELLO CHIARA	Ricercatore a tempo determinato	Univ. di PALERMO
	CONOSCENTI CHRISTIAN	Professore Ordinario	Univ. di PALERMO
CREDITS	6		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	2		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	**CONOSCENTI CHRISTIAN** Tuesday 10:30 12:30 Studio del docente. Riunione su piattaforma Teams. Thursday 10:30 12:30 Studio del docente. Riunione su piattaforma Teams. **MARTINELLO CHIARA** Tuesday 14:00 17:00 Via Archirafi 20, 4° piano, 2° stanza		

DOCENTE: Prof. CHRISTIAN CONOSCENTI

PREREQUISITES	GIS and cartography basic knowledge
LEARNING OUTCOMES	KNOWLEDGE AND UNDERSTANDING Students will be requested to acquire advanced knowledge on GIS systems, WEBGIS databanks and GIS analysis tools and softwares. APPLYING KNOWLEDGE AND UNDERSTANDING Students will be able, starting from fully downloaded data, to implement a GIS analysis project on issues of geologic applications. MAKING JUDGEMENTS Students will be asked to critically discuss the data of their study area and to recognise limits of the source data and potential solutions. COMMUNICATION SKILLS Students will be requested to present and discuss data and results using a rigorous language, but also being clear to a nonexpert audience. To be capable to critically discuss the obtained results in strong interaction with lecturer and other students, will be considered as compulsory. LEARNING SKILLS Being able to autonomously search for new databank and GIS tools repositories. At the end of the course, students will be ready to attend II level Masters and specialized seminars on the studied topics.
ASSESSMENT METHODS	Students are requested to prepare and illustrate a GIS analysis project, based on the downloading and processing of WEBGIS data, with applications to either hydrogeologic or geomorphologic issues. The assessment will be based on the formal correctness of the obtained data structure and output layouts prepared, as well as on the quality of the speech they will hold.
TEACHING METHODS	The course includes two modules, each structure in 1 theoretical/frontal ECTS (8 hours) and 2 ECTS of practical applications.

MODULE
GIS ANALYSIS AND THEMATIC CARTOGRAPHY

Prof. CHRISTIAN CONOSCENTI

SUGGESTED BIBLIOGRAPHY

Danielle Navarro. Learning statistics with R: A tutorial for psychology students and other beginners (Version 0.6), University of New South Wales. https://learningstatisticswithr.com/lsr-0.6.pdf

AMBIT	21015-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	43
COURSE ACTIVITY (Hrs)	32

EDUCATIONAL OBJECTIVES OF THE MODULE

The module aims at giving the students the required skills for processing GIS data acquired from national and international databank and implementing spatial, 3D and statistical analysis and modeling.

SYLLABUS

Hrs	Frontal teaching
1	Raster spatial analysis (mask analysis, reclassification and resampling)
3	DTM analysis and derived topographic attributes.
3	Variables importance estimation. Introduction to susceptibility analysis
1	Tools for model validation (ROC-plot, confusion matrix)

Hrs	Practice
9	GIS project building for landslide risk analysis: raster spatial analysis, DTM analysis and derived topographic attributes.
9	Landslide susceptibility models preparation.
3	Roc-curve and confusion matrix analysis.
3	Advanced management printed layout

MODULE
GEO-DATA ACCESS AND MANAGEMENT

Prof.ssa CHIARA MARTINELLO

SUGGESTED BIBLIOGRAPHY

Olaya, V. (2004) – A gentle introduction to SAGA GIS (scaricabile gratuitamente al sito http://www.saga-gis.org/en/index.html). QGIS development team (2014). Manuali utente di QGIS (scaricabile gratuitamente al sito http://www.qgis.org/it/docs/index.html)

AMBIT	21015-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	43
COURSE ACTIVITY (Hrs)	32

EDUCATIONAL OBJECTIVES OF THE MODULE

The module aims at giving the students all the required skills for fully accessing GIS data (raster/vector/grid) from national and international databank.

SYLLABUS

Hrs	Frontal teaching
1	Basic knowledge of GIS structure
1	GIS geoprocessing tools and plugins
1	Advanced management of GIS database (query, join, field calculator, statistical analyst)
1	Vector spatial analysis (buffer, merge, clip, difference, intersect and advanced tools for layer management)
1	Main webgis services: WMS, WFS, WCS, WPS.
1	Main international, national and local webgis thematic database (Portale Cartografico Nazionale, S.I.T.R., S.I.F., webgis Copernicus ecc.)
2	Introduction to remote sensing and LANDSAT repository access.

Hrs	Practice
8	GIS project building for landslide risk analysis: downloading and processing of source data layers from SITR, PCN, SIF and OGC services.
7	Vector data visualization and spatial analysis.
9	Accessing satellite images through the SentinelHub plugin and Semi-Automatic Classification.