

ADVANCED GEOMATIC APPLICATIONS FOR EARTH SCIENCES

The proposed seminar activity intends to open to the PhD students of the Earth and Environmental Sciences PhD school new opportunities on the applications of innovative techniques in the field of statistical interpolation of geochemical data and of the quantitative analysis of X-ray maps and of high-resolution optical scans of rocks and stone materials at the thin section scale. These approaches, recently developed within the Geoinformatics and Image Analysis laboratory (GeoImageLab) of our Department. These activities also intends to provide to the Ph.D students the rudiments for the autonomous development of automated processes in ArcGIS® environment structured by means of 'ready-to-run' tools, chained together also with new original Python scripts (i.e., Model Builder), useful to execute iterative and complex calculation through personalized executables, with particular regard to the field of statistical interpolation of disaggregated data and in the field of image analysis.

SEMINAR ACTIVITY PROGRAM				
	1 st day (lun 13/12/2021)	2 nd day (mar 14/12/2021)	3 rd day (giovi 16/12/2021)	4 th day (ven 17/12/2021)
09:00-10:00	Theory and methods of the GIS processes automation (the ArcGis toolboxes and model builder) Gaetano Ortolano (Theory)	Statistical interpolation of geochemical data on the ground (The IGneous -Mapper). Statistical interpolation techniques comparing the IDW vs. Kriging Gaetano Ortolano (Practice)	Quantitative analysis of multispectral X-ray images - The Quantitative X-Ray Map Analyzer Gaetano Ortolano (Practice) Roberto Visalli (Practice)	Fabric analysis of rocks and stone artefacts (The Micro Fabric Analyzer) Roberto Visalli (Practice)
10:00-11:00				
11:15-12:15	The geo-toolboxes of the Geoinformatics and Image Analysis laboratory (IG-mapper; Q-XRMA; Microfabric Analyzer) Gaetano Ortolano (Theory)	Quantitative analysis of multispectral X-ray images - The Quantitative X-Ray Map Analyzer Gaetano Ortolano (Practice)	Fabric analysis of rocks and stone artefacts (The Micro Fabric Analyzer) Roberto Visalli (Practice)	
12:15-13:15				

Head of the seminar activity Prof. G. Ortolano – Gaetano.Ortolano@unict.it

Teaching activity: Prof. G. Ortolano, Dr. R. Visalli

Students have to be basic knowledge on the main GIS applications with particular regard to those used in the ArcGis® environment. The course can be organized both in the presence, using the computer room of the Earth Sciences Section of the Department of Biological, Geological, and Environmental Sciences, and remotely on teams after downloading the ArcGis software from the website (<https://software.unict.it/Login.aspx>) accessible ONLY for UniCT PhD students. The students will be able to submit any specific case studies to the attention of the teachers, previously agreed with the head of the seminar. Cross polarizer high-resolution thin-section scans, EDS and WDS X-Ray Maps, and microfluorescence images of rocks and stone materials are welcomed. In the case that the course will be held in presence, the maximum number of students will vary between 13 and 25 units depending on the evolution of anti-Covid regulations. The documents developed by the students during the practical activities will be evaluated for the achievement of the training credits.