Università degli Studi della Basilicata
Scuola di Ingegneria

COURSE: GIS and Environmental Modelling				
TEACHER: Aurelia Sole				
e-mail: Aurelia.sole@unibas.it		website:		
Language: Italian or English if are present foreign students				
ECTS: 9	n. of hours: 81	Academic year: 2014/15	Campus: Potenza	Semester: I

TOPICS

The course after a framework on the use of Geographic Information Systems and the characteristics of Geodatabase, faces all components of the system: from data acquisition to the presentation and documentation, spatial analysis on a territory also in relation to digital terrain models, integration of data from different sources, interoperability of data and features provided by the INSPIRE Directive.

The course also aims to integrate GIS data within models for the evaluation of environmental dynamics or for the study and assessment of the hazard on the hydrogeological risk.

Therefore, models will be introduced and applications of these models will be carried out through a project work and exercises held in the GIS laboratory of the School of Engineering, with the use of GIS software open source.

TEACHING METHODS (please tick one or more options)

x Theoretical lessons
☐ Tutorials in classroom
x Tutorials in laboratory
x Project works
☐ Technical visits
Other activities (please specify) _____

TEXTBOOKS

Principles of Geographical Information Systems (Spatial Information Systems) P. A. Burrough, R. A. McDonnell,

Geographical Information Systems in Hydrology a cura di V. P. Singh e M. Fiorentino, Kluwer Academic Publishers.

Lecture notes, user manual of software QGIS, GRASS.

ON-LINE EDUCATIONAL MATERIAL

web address: Every academic year, a shared folder with the students, is created, for the exchange of didactic materials and data necessary for project work and exercises.

LEARNING OUTCOMES

Knowing the cartographic data, with particular reference to the Italian cartography, know the basic concepts of geographic projection systems, relevant for the proper geo-referencing of the data territorial; know the principles of global positioning system (GPS) and their applications; acquire data from regional authorities in different formats and georeferencing according to the coding required; perform editing and verification of data quality; make data available in a computerized structure according to predetermined specifications from the implementation of a GIS; make the documentation as a standard generation metadata, according to INSPIRE EU Directive, perform operations on spatial data in order to obtain information made starting from simple structures, -generate digital terrain models with various methods, starting from elevation databases from different sources, data acquisition and remote interfacing with the SIT, -prepare the data for the simulation models through interpretation of environmental dynamics, -generate thematic maps according to the required specifications

REQUIREMENTS

EVALUATION METHODS (please tick one or more options)

☐ Intermediate verifications
x Written examination
x Discussion of a project work
x Practical test
☐ Oral examination

Other methods (please specify) _____

DETAILED CONTENT

Introduction to Geographic Information Systems; Geo-database and digital representation; Model of data; sources of data, data acquisition, interchange formats; problems of verification, documentation and data quality; INSPIRE Directive; correction and updating of data; Space Operations of vector data; space operations on raster data: Map algebra; Digital Terrain Models (Grid and TIN); Information derivable from a digital terrain model; Environmental models, distributed models; Integration of GIS and models (rainfall- runoff models, models for the study of diffuse pollution, erosion models, models of flood vulnerability models of an area etc..).

The course will be conducted in the GIS laboratory of the Engineering School, exercises with the use of GIS software and the application of one or more of these models.

SEMINARS BY EXTERNAL EXPERTS YES x NO ☐

FURTHER INFORMATION