Geographic Information System

Component
École Nationale Supérieure d'Électrotechnique d'Électronique

In brief

- **plugin.odf-inp:PLUGINS_ODF_COURSE_NBHOURS_TXT:** 14 de TD
- **Code ELP:** N9EM11A

Presentation

Objectives

These courses and tutorials are designed to introduce students to the principles of the Systems Information Geographic and their use.

Description

- Course: "Introduction to GIS
This course explains the fundamental principles of Geographic Information Systems. Course Outline:

Definition of a GIS, the components of a GIS (data, methods, human resources, etc.), the use of GIS and the use of GIS in the development of a GIS. and hardware), main functionalities, data representation mode (raster, vector),data structuring (storage models), repositories and cartographic projections (geoid, ellipsoid and geodetic systems), georeferencing. The different notions are illustrated in the tutorial framework.

Course: "Relief representation and digital terrain model".
This course provides an overview of the cartographic methods used to represent relief and exposes the theoretical basis for creating and manipulating digital terrain models (MNT). The concepts seen during the course are applied in the framework of tutorials.Course outline: Representation of the relief on a map (definition, side points, contour lines, etc.), special figures, illumination and fading, hypsometric tints). General characteristics of DTM (definition, mode of representation, principles of elaboration). Data

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sources for the construction of MNT. Interpolation methods: global interpolation method (area of trend), local interpolation methods (moving average,inverse distance weighting, overview of kriging). Information derived from DTMs: slope and orientation, flow direction (method D4 and D8), calculation of drained surfaces, extraction of watersheds and network hydrographic, topological description of the hydrographic network.

Contents of the TSTs :
Introduction to ArcGIS software (and Spatial Analyst and 3D analyst extensions) and Idrisi software.
1) Introduction to ArcGIS software functionalities
2) Georeferencing of a topographic map (Idrisi)
3) Creation and manipulation of DTM - spatial analysis in raster mode (ArcGIS)
4) Network management
5) Modelling and assessment of soil sensitivity to erosion at the regional scale in France (ArcGIS)

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