UNIVERSITY OF PANNONIA

SUBJECT DATASHEET

Semester:	2010/11/2
Subject:	GIS
Code:	VEMKKVB254G
Responsible department:	Department of Environmental Engineering
Responsible department code:	MKKV
Responsible lecturer:	Imre Magyar

Educational objectives:

To make acquainted the students with the up-to-date geoinformation systems, their possible utilisation in environmental protection.

Detailed content of the subject:

1. The concept of geoinformatics and its connection with other sciences. History of geoscience, its market position, development trends. Geographical Information System (GIS), connected sciences, possible applications. Maps, analysis of maps. 2. Computers, software packages (Arc/lnfo, Arc/View, Idrisi, Microstation, Ilwis, Erdas, Mapinfo, Grass). Possibilities of vector and raster GIS's. 3. Sampling, data input (digitising, scan, data bases). Environmental resource data (thematical, topographic, remote sensing). Spatial data bases, objects, data base models (point, line, polygon) and their connection, spatial relation, spatial analysis.. 4. Representation, user GIS connection, production of complex product, GIS as archive. 5. General coordinate systems, geocoding. (planar, Descartes, polar, spherical coordinates). Map projections, affin and non-linear transformation (deformation types, representation of the Earth, geometrical analogies, Mercator universal transversal projection, Hungarian systems , EOTR) Discrete geographical referencing. 6. Vector data and objects. Storage of complex objects, lines, chain codes, intersections of lines, polygons, polygon processes. 7. Raster data and algorithms. Raster storage, hierarchic storage. Four tree algorithm and spatial index. Remote sensing as information source. 8. Algorithm and data structure of surface and time data. Digital terrain models (Creation and use of DTM, assessment of height, slope and direction, possible utilisation) TIN model. Spatial interpolation. 9. GIS databases. Database conceptions. 10. Fault and reliability modelling. accuracy of spatial databases. Process errors. Fractals. Line generalisation.. 11. PAPER EXAMINATION 12. Representation. Representation of spatial data (geographical background, graphical parameters, colours). 13. Possible utilisation of GIS (geographic, survey, engineering sciences, remote sensing, scientific researches, environmental protection) Resource management Urban design Cadastral data and LIS Automated mapping and public utility management Demographic and networking Decision making Environmental protection 14. GIS and environmental protection. Geoinformatic standards. GIS and geosciences. The future of GIS. 15. Presentation of the group works.

Requirements:

During the semester the students make a group work in 2-3 members of team. The result of the work is the GIS analysis of a selected area in digital and written form.

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Required and suggested references:

Understanding GIS: ESRI 1990, NCGIA Core Curriculum I-IV. szerk. Márkus Béla EFE FFFK, Térinformatika menedzsereknek: Lisziewicz Andrea L & Mark Térinformatikai Kft., Távérzékelés. Csornai Gábor - Dr. Dalia Olivér EFE FFFK egyetemi jegyzet, Detrekői Á. - Szabó Gy.: Bevezetés a térinformatikába, Nemzeti Tankönyvkiadó, 1995. Magyar Imre: Térinformatika környezeti menedzsereknek kézirat 1995.