BELARUSIAN STATE UNIVERSITY
DEPARTMENT OF GEOGRAPHY

GIS-Mapping of Land Belarusian Experience

The Program of the University Course for Master Students

Lections	28 academic hours
Laboratory GIS Projects	16 academic hours
Controlled Personal GIS Projects	34 academic hours

Minsk, 2009

Course Objectives

The overall goals of the course "GIS-mapping of land. Belarusian experience" are to:

- Promote understanding of the land information systems;
- Promote to study the Belarusian experience in GIS-mapping of land;
- Promote to use various data sources for GIS-mapping of land.

The particular objectives of each chapter of the course text and associated GIS-projects are outlined below.

Chapter 1. Introduction in GIS-Mapping of Land

Main objectives of GIS-mapping of land. Temporal progress of methods of GIS-mapping of land. GIS software and main data sources for GIS-mapping of land. Land information systems. Belarusian experience of GIS-mapping of land. Land information systems of the Republic of Belarus.
GIS project: Building a land information system geodatabase. Creating topology, subtypes and attribute domains (ArcGIS).

Chapter 2. GIS-Mapping of Land on Basis of Remotely Sensed Image Data

Remote-sensed data. Main sources of remote-sensed data. Visual photointerpretation of remote sensing imagery for GIS-mapping of land. Automated classification of remote sensing imagery for GIS-mapping of land: data preparation (spatial, radiometric, spectral enhancements) unsupervised and supervised classification. Belarusian experience of GIS-mapping of land on basis of remotely sensed image data.
GIS projects: Visual photointerpretation of types and sybtypes of land on basis of aerial photographs (ArcGIS); automated classification of types and sybtypes of land on basis of Landsat 7 satellite imagery data (Image Analysis for ArcGIS).

Chapter 3. GIS-Mapping of Land on Basis of Land Surveys and GPS

Field geodetic survey of land. Main geodetic instruments for land-surveying. Processing of field geodetic survey data. Exporting survey data in GIS. Working with survey and GPS data in GIS. Belarusian experience of GIS-mapping of land on basis land surveys and GPS.
GIS projects: Processing of field geodetic survey data (Credo_Dat or Survey Analyst for ArcGIS), exporting survey data in GIS and making a land parcels map on basis of survey data (ArcGIS).

Chapter 4. GIS-Mapping of Land on Basis of Existed Cartographical Materials

Methods of GIS-mapping of land on basis of already existed cartographical materials. Belarusian experience of GIS-mapping of land on basis of existed cartographical materials.
GIS projects: Automatic vectorization of a scanned landforms map for DEM preparation (ArcScan for ArcGIS), vectorization of a scanned parcels map (ArcGIS).

Chapter	All academic hours	Lections	Laboratory GIS-projects	Controlled personal GIS-project
Chapter 1. Introduction in GIS-Mapping of Land	16	6	4	6
Chapter 2. GIS-Mapping of Land on Basis of Remotely Sensed Image Data	24	8	6	10
Chapter 3. GIS-Mapping of Land on Basis of Land Surveys and GPS	18	8	2	8
Chapter 4. GIS-Mapping of Land on Basis of Existed Cartographical Materials	20	6	4	10
All	78	28	16	34

Literature for Reading:

1. Using ArcCatalog. – Redlands, USA: ESRI, 2004.
2. Building a Geodatabase. – Redlands, USA: ESRI, 2004.
3. Using ArcMap. – Redlands, USA: ESRI, 2004.
4. Editing in ArcMap. – Redlands, USA: ESRI, 2004.
5. Using ArcGIS Spatial Analyst. – Redlands, USA: ESRI, 2004.
6. Using ArcGIS 3D Analyst. – Redlands, USA: ESRI, 2003.
7. Using ArcScan for ArcGIS. – Redlands, USA: ESRI, 2003.
8. Using ArcGIS Survey Analyst. – Redlands, USA: ESRI, 2003.
9. Using Image Analysis for ArcGIS. – Norcross, USA: Leica Geosystems, 2006.