



**MSc Programme – Forestry**

**FOR 303 Geographic information systems**

Obligatory subject /in 1-st semester for Bulgarian students/

ECTS credits – **5.0** Ability to teach a foreign language – **English**

Syllabus in brief

***I. Lectures:***

- 1. Geographic information management technology** – key terms, GIS definitions, capabilities of GIS and relations with relevant technologies and scientific fields, origin of GIS and evolution of the technology.
- 2. Data base concepts** – data types in GIS, data entry for building the data base, space concepts in GIS.
- 3. Hardware GIS components** – the central processing unit, auxiliary storage devices, input/output peripheral devices.
- 4. Software GIS components** – lower-level software, GIS application software, special application software and application development tools.
- 5. Data structuring models** – models for structuring the graphic data (vector and tessellation models), models for structuring the nongraphic data (hierarchical, network, relational models).
- 6. Coordinate systems and cartographic projections in GIS** – concepts of shape and size of the Earth, coordinate systems, cartographic projections, geodetic projections (Gaussian projection and coordinate systems, other projections and coordinate systems).
- 7. GIS and Remote sensing** – RS as a source of geographic data, methods and tools for processing and interpretation of data, interconnections and integration of GIS and RS.
- 8. New trends in GIS** – life cycle of the data, operational compatibility of GIS, Internet GIS, trends and future of GIS in the management of Environment and Forests.

***II. Exercises:***

1. Introduction to GIS software MapInfo Professional – applications, modules, data types and formats, main types of files, main menus, shortcut keys, tools, types of windows, objects, layers.
2. Entering graphic data (raster and vector). Conversion to/from different formats. Organization in layers, creating special applications (workspaces)
3. Compilation of thematic maps – projections and coordinate systems, choice of mapping methods. Making legends, 3D maps and visualization of digital terrain models.
4. Entering nongraphic data. Conversion of attribute data from external databases. Basic operations with tables, selection and queries, (select, SQL), joining, analysis.
5. Geocoding graphic and nongraphic data. Producing diagrams. Creating models and print files. Working with other applications.
6. Entering raster data – creating raster layers (registration and image processing). Possibilities for digitizing in MapInfo environment. Working with additional modules composed with MapBasic
7. Developing of a project: creation and management of a database in "MapInfo".

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