Study program	Study cycle	First study cycle
	Orientation	Tourism and Environmental Protection

SUBJECT

Subject name	**GIS**			
Subject code	Semester	Subject status	ECTS credits	Contact hours
GIS-211-3	IV	Mandatory	5	125
Prerequisites				
Assigned professors and assistants	Subject Leader	Dr. Sc., Nusret Drešković, Full Professor		
	Teaching Assistants	MA Amina Sivac, Senior Teaching Assistant		

Subject objectives

The main Subject objectives are:
- Exploring and acquiring knowledge of students about geographic information systems and software for GIS;
- Exploring and acquiring knowledge of students about GIS databases, their design and operations and management;
- Exploring and acquiring knowledge of students about GIS analysis on the different types of data and their potential application in optimization of the use of space and solving spatial conflicts;
- Exploring and acquiring knowledge of students about the data of satellite observations of the Earth and their application in various fields of science and industry segments;
- Exploring and acquiring knowledge of students with multicriteria analysis and possibilities of creating new 2D and 3D sets of thematic maps of the investigated physical phenomena and processes;
- Exploring and acquiring knowledge of students with the content and the possibilities of using data contained in a digital atlas of Bosnia and Herzegovina, individual continents and the world;
- Exploring and acquiring knowledge of students about models of geoinformatics management of geo-ecological phenomena and processes;
- Exploring and acquiring knowledge of students about the possibilities of applying different GIS modules and operations for the purpose of creation of new tourism value;
– Exploring and acquiring knowledge of students about the possibilities of applying different GIS modules and operations for the purpose of creating spatial geobases in accordance to various spatial planning categories.

SUBJECT CONTENT

#	Teaching units	Contact hours			
		L	P	S	C
1	Geographic Information System (GIS) - concept, definition, development and organizational structure. Distribution of GIS. The main operation and functional levels of GIS. Hardware in GIS. Basic GIS softwares.	2			
2	GIS user interface - methodological concept of organisation of interfaces and its use. GIS methodological concept of management and labor with geodata.	2	2		
3	GIS database - concept, definition, structure and organization. Types of GIS database. Sources of GIS database.	2	2	2	1
4	Creating a GIS database. Metadata. GIS process models and scripts. Geoprocessing of data. Geovisualization of data.	2	2	1	1
5	Themed sets and models of GIS data. Types of GIS data. Vector data - concept, types and importance. Point type of vector data. Line type of vector data. Polygon type of vector data. Working with vector data.	3	4	3	1
6	A raster data type - concept, types and importance. Structure of raster data. The formats of raster data. Satellite images - concept, types and significance. Air images - concept, types and importance. Working with raster data.	3	4	3	1
7	The first test	1			
8	Creating data for GIS. Attributes data and attribute tables. Analog geographical maps. Methods and processes of preparing data for GIS. Editing data.	2	4	3	1
9	GIS catalog. Convert the basic GIS data types. Converting raster to vector data. Convert the vector the raster data. GIS and AutCAD. GPS data.	2	2	1	1
10	Topological analysis - concept, purpose and significance. Types of topological analysis. Basic topological analysis with GIS maps. Basic	2	2	1	1

	topological analysis with geodatabases.				
11	Spatial GIS analysis. Methods and Models 2D spatial interpolation of data. Spline spatial interpolator. IDW spatial interpolator. Kriging spatial interpolator. Working with spatial data.	2	2	2	1
12	3D spatial analysis. Basic mathematical and functional analysis of the surface topography. The zonal statistics.	2	2	2	1
13	Management of GIS databases. Spatial reference of geodatabases. World coordinate systems - Overview and transformation into a GIS. Georeferencing.	2	2	2	1
14	ArcGIS - user levels and types. Arc Catalog. ArcMap. ArcGlobe. Model Builder. ArcGIS Desktop - The user organizations and functional levels. ArcView. ArcEditor. ArcInfo. Optional extensions for ArcGIS Desktop.	2	2		
15	Analysis of seminar papers	1			

STUDENT WORKLOAD (HOURS)

Contact Hours (L+P)	60	Practical work	10	Seminars	20	Exam study time	10
Literature – reading	15	Written papers	-	Other (state)	10	TOTAL	125

LITERATURE

BASIC LITERATURE:

1. Đug S., Dreško vić, N., Odžak, S. (2015): Daljinska istraživanja – principi i primjena u prirodnim naukama. University textbook.. University of Sarajevo. Sarajevo.
2. Burrough, P.A., McDonnel, R.A. (2006): Principles of Geographical Information Systems – 2nd Edition.Oxford University Press.
3. Heywood, I., Cornelius, S., Carver, S. (2006): An Introduction to Geographical Information Systems. Pearson Education Limited.

ADDITIONAL LITERATURE:

1. 2. Fortheringham, A. S., Rogerson, P. A. (1994): Spatial Analysis and GIS. Technical Issues in Geographic Information Systems. Taylor and Francis. London.
2. ESRI (2012) ArcGIS 10. Using ArcGIS Desktop. ESRI. Redlands. USA.

EVALUATION OF KNOWLEDGE AND CRITERIA

	PARAMETERS	Maximum Points	Minimum points
1.	Attendance	5	3
2.	Participation on lectures	5	3
3.	Midterm exams	40	21
4.	Seminar	10	6
5.	Students project		
6.	Final exam	40	22
Total		100	55

Notes: Practice is organized in a GIS Center of the Department of Geography by groups of students.