

## Specification for the book of courses

<b>Study program</b>		Computing and Informatics		
<b>Module</b>		Software Engineering		
<b>Type and level of studies</b>		Master studies		
<b>The name of the course</b>		Geographic Information Systems		
<b>Lecturer (for lectures)</b>		Stojanović H. Dragan, Stojanović M. Natalija		
<b>Lecturer/associate (for exercises)</b>		Predić B. Bratislav		
<b>Lecturer/associate (for OFE)</b>				
<b>Number of ECTS</b>	4	<b>Course status (obligatory/elective)</b>	Elective	
<b>Prerequisites</b>				
<b>Course objectives</b>	Acquiring knowledge, methods and technologies required for design and implementation of geographic information systems (GIS).			
<b>Course outcomes</b>	Theoretical and practical knowledge about principles, methods, software tools, omponents and frameworks for design and implementation of geographic information systems (GIS).			
<b>Course outline</b>				
<b>Theoretical teaching</b>	Introduction to geographic information systems (GIS). Geographic and cartographic foundations of GIS. Architecture and design GIS-a. Methods and systems for positioning. Satellite systems for global positioning - GPS (Global Positioning System). System for positioning based on wireless networks in indoor environment. Geospatial data models. Geospatial data representations and algorithms for processing. Index structures and access methods. Spatial databases. GIS architecture and design. Geo-visualization and GIS interfaces. Methods and algorithms for geospatial data analysis. Time in GIS and spatio-temporal data management. Processing and analysis of Big geospatial data. Specification and standards in geospatial and GIS domains (OGC, ISO TC 211, etc.). Web GIS and distributed GI services. Mobile GIS and location-based services.			
<b>Practical teaching (exercises, OFE, study and research)</b>	Work on design and implementation of geographic information system using commercial and open source software components, frameworks and platforms. Spatial database design and implementation. Implementation of GIS functionalities for storage, processing, search, analysis, and visualization of geospatial and spatio-temporal data. Implementation of Web GIS applications and Web services based on OGC standards and specifications. Implementation of mobile GIS applications.			
<b>Textbooks/references</b>				
1	M. Worboys, M. Duckham, GIS: A Computing perspective, second edition, CRC Press, 2004.			
2	P. A. Longley, M. F. Goodchild, D. J. Maguire, D. W. Rhind, Geographic Information Systems and Science, 3rd edition, John Wiley & Sons, 2010.			
3	P. Rigaux, M. Scholl, A. Voisard, Spatial Databases: With Application to GIS, Morgan Kaufmann, 2002			
4	Kang-tsung Chang, Introduction to Geographic Information Systems, 6th Ed, McGraw-Hill Science, 2011			
5				
<b>Number of classes of active education per week during semester/trimester/year</b>				
<b>Lectures</b>	<b>Exercises</b>	<b>OFE</b>	<b>Study and research work</b>	<b>Other classes</b>
2	1	0		
<b>Teaching methods</b>	Lectures, auditive exercises, lab practicing, independent student work on assignments and projects, student seminars.			
<b>Grade (maximum number of points 100)</b>				
<b>Pre-exam duties</b>		<b>Points</b>	<b>Final exam</b>	<b>Points</b>
<b>Activity during lectures</b>			<b>Written exam</b>	40
<b>Exercises</b>			<b>Oral exam</b>	
<b>Colloquia</b>		40		
<b>Projects</b>		20		