

<b>Study program: Artificial Intelligence</b>			
<b>Name of the subject: Geospatial Databases</b>			
<b>Teacher(s): Danijela Tešendić</b>			
<b>Status of the subject: elective</b>			
<b>Number of ECTS credits: 5</b>			
<b>Conditions: none</b>			
<b>Subject goal</b>			
Introduction to the concept of spatial databases, as well as to methods for storing and searching spatial data.			
<b>Outcome of the subject</b>			
<i>Minimum:</i>			
After successfully completing this course, students can explain the features of spatial databases, methods for storing data within databases, as well as methods for searching data.			
<i>Desirable:</i>			
After successfully completing this course, students can explain the features of spatial databases, methods for storing data within databases, as well as methods for searching data. Also, students are capable of integrating spatial databases with various tools and applications for data visualization.			
<b>Subject content</b>			
<i>Theory</i>			
During the course students are introduced with different types of spatial data, methods for their storage and visualization, as well as with the sources of spatial data and possibilities for their processing and preparation for further use.			
Through the first section of the course students are introduced with extensions of database that enable storing spatial data. These extensions include geometry data types that allow storing spatial components, as well as SQL language extensions that enable searching spatial data and creating spatial queries. After that, students are introduced with approaches to access spatial database using different tools and applications for manipulation and visualization of spatial data.			
Through the second section of the course students are introduced with methods for storing other types of spatial data, such as raster data, and methods for their manipulation and visualization.			
<i>Practical learning</i>			
In the practical part of the course, students use <i>PostgreSQL</i> database server, all together with <i>PostGIS</i> extension for storing spatial data. <i>PostgreSQL</i> tools are used to access database, insert and search data. In addition, various tool for spatial data visualization such as <i>QGIS</i> software and <i>GeoServer</i> are used, as well as various data processing and preparation tools.			
<b>Literature</b>			
<i>Recommended</i>			
1. Shekhar, Shashi, Sanjay Chawla. <i>Spatial databases: a tour</i> . Prentice Hall, 2003.			
2. Obe, Regina O., Leo S. Hsu. <i>PostGIS in action, Second Edition</i> . Manning Publications Co., 2015.			
3. Rigaux, Philippe, Michel Scholl, and Agnes Voisard. <i>Spatial databases: with application to GIS</i> . Morgan Kaufmann, 2001.			
4. Westra, Eric, <i>Python Geospatial Development - Third Edition</i> , Packt Publishing Limited., 2016.			
<b>Number of active teaching classes</b>		<b>Theoretical teaching: 2</b>	<b>Practical teaching: 2</b>
<b>Method of carrying out the teaching</b>			
Theoretical instruction is oral with the use of computer equipment. Practical instruction is performed in computer classroom where students through practical assignments learn how to use tools and through practical examples illustrate theoretical concepts discussed in lectures.			
<b>Evaluation of knowledge (maximum number of points 100)</b>			
<b>Pre-exam obligations</b>	points	<b>Final exam</b>	points
test	30	Oral exam	40
project	30		