Subject code: ZŽS-227	**Subject name:** GIS Analysis and Modeling of Geospatial Content		
Study cycle: III	**Year: I**	**Semester: II**	**ECTS credits: 6**
Status: elective		**Contact hours:** 60 Lectures: 30 Exercises: 30	
Assigned professors and assistants:	Lecturers and assistants selected for the field to which the course belongs		
Prerequisits:	/		
Subject objectives:	– To acquaint students with and provide knowledge on contemporary trends in modeling geospatial content using GIS. – To familiarize students with the application possibilities of multi-criteria GIS analyses in modeling geospatial content.		
Teaching units:	1. Management of Spatial Data: Analysis and Modeling in GIS 2. Contemporary Trends in Geospatial Content Modeling: Applications and Contributions of GIS 3. Application of GIS in Urban Planning 4. GIS Modeling Based on Multi-Criteria Analysis 5. Multi-Criteria GIS Analyses in Modeling Hydrological Phenomena and Processes 6. Multi-Criteria GIS Analyses in Modeling Climatic Phenomena and Processes 7. Multi-Criteria GIS Analyses in Site Suitability Analysis for Industrial Plant Construction 8. First Test 9. GIS Spatial Analyses in Land Use Change Analysis 10. Application of GIS in Environmental Spatial Content Modeling 11. Application of GIS Simulation Models and Geo-Visualization Methods in Traffic Analysis 12. Application of GIS and Remote Sensing in Vegetation Analysis and Modeling 13. Temporal GIS and Spatio-Temporal Modeling 14. Designing Geodatabases: Case Studies in GIS Data Modeling 15. Student Project Assingment Analysis		
Learning outcomes:	**Knowledge:** – The student describes contemporary trends in geospatial content modeling.		

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– The student describes the possibilities of applying GIS in geospatial content modeling.

Skills:
– The student assesses the most optimal locations for the construction of geospatial content.
– The student connects physical geographic and socio-geographic components of space with locations of geospatial content.

Competencies:
– The student predicts and proposes the most optimal locations for the construction of geospatial content using GIS.
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<tr><td>Teaching methods:</td><td>Theoretical lectures and practical courses using various multimedia tools and application software.</td></tr>
<tr><td>Knowledge testing methods with grading structure[1]:</td><td>
<table>
<tr><th></th><th>Maximum Points</th><th>Minimum points</th></tr>
<tr><td>Attendance</td><td>5</td><td>3</td></tr>
<tr><td>Participation on lectures</td><td>5</td><td>3</td></tr>
<tr><td>Student project assingments</td><td>50</td><td>27</td></tr>
<tr><td>Final exam</td><td>40</td><td>22</td></tr>
<tr><td>TOTAL</td><td>100</td><td>55</td></tr>
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Assessment:
<table>
<tr><th>Grade</th><th>ECTS grade</th><th>Points scale</th></tr>
<tr><td>10</td><td>(A) excellent</td><td>95 - 100</td></tr>
<tr><td>9</td><td>(B) very good</td><td>85 - 94</td></tr>
<tr><td>8</td><td>(C) good</td><td>75 - 84</td></tr>
<tr><td>7</td><td>(D) satisfactory</td><td>66 - 74</td></tr>
<tr><td>6</td><td>(E) sufficient</td><td>55 - 64</td></tr>
<tr><td>5</td><td>(F, FX) insufficient</td><td>55</td></tr>
</table>
</td></tr>
<tr><td>Literature[2]:</td><td>Mandatory:
1. Đug S., Dreško vić, N., Odžak, S. (2015) Daljinska istraživanja–principi i primjena u prirodnim naukama. Univerzitetski udžbenik. Univerzitet u</td></tr>
</table>

[1] The structure of points and point criteria for each subject is determined by the Council of the organizational unit before the beginning of the academic year in which the subject is taught in accordance with Article 64, paragraph 6 of the Law on Higher Education of Sarajevo Canton

[2] The Senate of the higher education institution as an institution or a council of the organizational unit of the higher education institution as a public institution determines mandatory and recommended textbooks and manuals, as well as other recommended literature on the basis of which exams are prepared by a special act which is required to be published on its website before the beginning of the academic year in accordance with Article 56, paragraph 3 of the Law on Higher Education of the Sarajevo Canton.

Sarajevu. Sarajevo.
2. Goodchild, M.F., 2005. GIS and modeling overview. GIS, spatial analysis, and modeling. ESRI Press, Redlands, pp.1-18.
3. Reddy, G.O., 2018. Spatial data management, analysis, and modeling in GIS: principles and applications. Geospatial Technologies in Land Resources Mapping, Monitoring and Management, pp.127-142.
4. Yeh, A.G., 1999. Urban planning and GIS. Geographical information systems

Recommended:

1. Rahman, M.R. and Lateh, H., 2017. Climate change in Bangladesh: a spatio-temporal analysis and simulation of recent temperature and rainfall data using GIS and time series analysis model. Theoretical and applied climatology
2. DeVantier, B.A. and Feldman, A.D., 1993. Review of GIS applications in hydrologic modeling. Journal of Water Resources Planning and Management, 119(2), pp.246-261.
3. Alijani, B., Ghohroudi, M. and Arabi, N., 2008. Developing a climate model for Iran using GIS. Theoretical and Applied Climatology
4. Bielecka, E., 2020. GIS spatial analysis modeling for land use change. A bibliometric analysis of the intellectual base and trends. Geosciences, 10(11), p.421.
5. Fedra, K., 1993. GIS and environmental modeling. Environmental modeling with GIS, pp.35-50.
6. Murray, A.T., 2010. Advances in location modeling: GIS linkages and contributions. Journal of geographical systems, 12, pp.335-354.
7. Wang, X., 2005. Integrating GIS, simulation models, and visualization in traffic impact analysis. Computers, Environment and Urban Systems, 29(4), pp.471-496.
8. Goodchild, M.F., 1994. Integrating GIS and remote sensing for vegetation analysis and modeling: methodological issues. Journal of Vegetation Science, 5(5), pp.615-626.
9. Yuan, M., 1996, January. Temporal GIS and spatio-temporal modeling. In Proceedings of Third International Conference Workshop on Integrating GIS and Environment Modeling, Santa Fe, NM (Vol.

	33). 10. Arctur, D. and Zeiler, M., 2004. Designing Geodatabases: case studies in GIS data modeling. ESRI, Inc.