



UNIVERSITY OF SARAJEVO – FACULTY OF SCIENCE
SUBJECT DESCRIPTION

Form SP2

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Subject code: FG-103-4	Subject name: Remote Sensing Methods in Environmental Research		
Study cycle: II	Year: I	Semester: I	ECTS credits: 6
Status: Mandatory		Contact hours: 60 Lectures: 30 Practical courses: 30	
Assigned professors and assistants:	Lecturers and assistants selected for the field to which the course belongs		
Prerequisites:	/		
Subject objectives:	Acquiring knowledge about the principles of remote sensing operation and their products. Also, acquiring knowledge about the processes of processing and analyzing remote sensing images and their integration with GIS. Mastering the use of remote sensing images in the analysis of environmental elements, natural and social phenomena and processes, degraded areas, as well as in planning, protection, management, and monitoring of the environment.		
Teaching units:	1. Introductory lectures – Principles of remote sensing operation. 2. Remote sensing products – Terrestrial imaging, aerial photography, and satellite imagery. 3. Comparison of aerial and satellite images. 4. Basic image processing procedures. 5. Satellite image analysis for environmental research purposes (image processing procedures). 6. Measurements on remote sensing images (point, linear, and polygonal objects). 7. Enhancing visual interpretation – Image processing techniques used in remote sensing research. 8. Spatial filtering of remote sensing images. 9. Global positioning and remote monitoring (GPS technology). Improving geometry in images. 10. Integration of remote sensing images with GIS, aerial photo image processing for geospatial research (integration and georeferencing). 11. Application of vegetation indices on satellite images. 12. Application of various models in environmental element analysis. 13. Application of remote sensing in analyzing natural and		



	social phenomena and processes in the environment. 14. Application of remote sensing in analyzing degraded areas and determining degradation factors. 15. Application of remote sensing in environmental planning, protection, management, and monitoring.														
Learning outcomes:	Knowledge: - Recognizes the possibilities of applying remote sensing products in environmental research. - Recognizes natural and social elements and processes in the environment through the use of remote sensing. - Analyzes natural and anthropogenic accidents in the environment using remote sensing. Skills: - Applies remote sensing in the research of natural and anthropogenic accidents in the environment. - Applies remote sensing in the research of degraded areas. Competencies: - Independently acquires, integrates, and georeferences remote sensing images. - Independently models natural and anthropogenic accidents in the environment based on remote sensing data.														
Teaching methods:	Multimedia presentation and discussion (lectures); practical work, educational material analysis and discussion (practical courses).														
Knowledge testing methods with grading structure¹:	<table> <tr> <th></th><th><i>Points</i></th></tr> <tr> <td>Attendance</td><td>5</td></tr> <tr> <td>Participation on lectures</td><td>5</td></tr> <tr> <td>Partial exam</td><td>40</td></tr> <tr> <td>Seminar paper</td><td>10</td></tr> <tr> <td>Final exam</td><td>40</td></tr> <tr> <td>TOTAL</td><td>100</td></tr> </table>		<i>Points</i>	Attendance	5	Participation on lectures	5	Partial exam	40	Seminar paper	10	Final exam	40	TOTAL	100
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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



	Assessment: <table><tr><td><i>Grade</i></td><td><i>ECTS grade</i></td><td><i>Points scale</i></td></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>	<i>Grade</i>	<i>ECTS grade</i>	<i>Points scale</i>	10	(A) excellent	95 - 100	9	(B) very good	85 - 94	8	(C) good	75 - 84	7	(D) satisfactory	66 - 74	6	(E) sufficient	55 - 64	5	(F, FX) insufficient	55
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Literature²:	Mandatory: 1. Đug, S., Drešković, N., Odžak, S. (2015): Daljinska istraživanja – principi i primjena u prirodnim naukama. Univerzitetski udžbenik. Izdavač: Univerzitet u Sarajevu, Prirodno-matematički fakultet Sarajevo. ISBN 978-9958-592-62-1, COBISS. BH - ID 22089478 2. Horning N., Robinson J., Sterling E., Turner W., Spector S. (2015): Remote Sensing for Ecology and Conservation, Oxford, UK, Oxford University Press. 3. Weng Q. (2015): Remote Sensing and GIS Integration – Theories, Methods, and Applications, The McGraw Hill, New York. 4. Campbell J., Wynne R., (2011): Introduction to Remote Sensing, Guilford Press, New York. 5. , Redlands, California. Recommended: 1. Thenkabail S. P. (2016): Remote Sensing of Water Resources, Disasters, and Urban Studies, CRC Press, London/New York. 2. Chen C.H. (Ed.) (2008): Image Processing for Remote Sensing, CRC Press, New York. 3. Keranen K, Kolvoord R. (2016): Making Spatial Decisions Using GIS and Lidar – a Workbook, Esri Press Academic 4. Horning, N., Robinson, J.A., Sterling, E.J.,Turner, W., & Spector, S. (2010): Remote Sensing for Ecology and Conservation. A Handbook of Techniques. Oxford University Press Inc., New York.																					

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.