

NAME OF THE COURSE		EARTH OBSERVATION DATA AND ENVIRONMENTAL MONITORING				
Code		Year of study	1., II. semester			
Course teacher	Vladimir Crnojević, PhD, Vesna Crnojević-Bengin, PhD	Credits (ECTS)	5.0			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			30		15	
Status of the course	compulsory	Percentage of application of e-learning	/			
COURSE DESCRIPTION						
Course objectives	The goal of the course is the acquisition of knowledge related to the understanding of the techniques of remote sensing, the ability to design monitoring and creating GIS layers based on environmental parameters.					
Course enrolment requirements and entry competences required for the course	Undergraduate qualification (6th level of EQF or CROQF).					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>The student will:</p> <ul style="list-style-type: none"> - describe and interpret various Earth observation techniques and their capabilities. - describe and interpret in-situ and remote sensing monitoring concepts; - design a simple environmental monitoring system. - describe and interpret remote sensing technologies; - select and use satellite images; - select data through metadata search; - create GIS layer with environmental parameters. 					
Course content broken down in detail by weekly class schedule (syllabus)	<p>Overview of Earth observation systems. Acquisition, transmission, storage, analysis and representation of Earth observation data. In-situ sensing systems. Wireless sensor networks. Geo-referencing of data. Global positioning systems. Fundamentals of propagation of electromagnetic waves. Basics of wireless communication systems. Remote sensing. Imaging sensors (visible light, UV, IR, thermal, multispectral, hyperspectral, radar, SAR). Airborne and satellite imaging. Commercially available satellite data. Metadata and data formatting. Data representation.</p> <p>Case studies on the use of environmental EO data, with a special emphasis on water resources, coastal management and disasters: EUMETSAT (weather warnings, product navigator...), global seismographic network, tsunami early warning systems, floods, forest fires, monitoring of marine environment.</p>					
Format of instruction	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> <i>on line</i> in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input checked="" type="checkbox"/> independent assignments <input type="checkbox"/> multimedia <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor			
Student	Regular attendance of classes, tests, written and oral exam,					

responsibilities						
Screening student work (<i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i>)	Class attendance	1.5	Research		Practical training	2.0
	Experimental work		Report			
	Essay		Seminar essay			
	Tests	0.5	Oral exam	0.5		
	Written exam	0.5	Project			
Grading and evaluating student work in class and at the final exam	Frontal lectures. Exercises in groups. Preparing written assignment about a selected subject.					
Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	V. Crnojević, V. Crnojević-Bengin: lectures given as ppt files					
	D. Culibrk, D. Vukobratovic. V. Crnojevic, Sensing Technologies For Precision Irrigation, Springer Science (currently in print)					
Optional literature (at the time of submission of study programme proposal)	To be defined in accordance with student's particular interests and theme of student's assignment.					
Quality assurance methods that ensure the acquisition of exit competences	Quality assurance will be performed at three levels: (1) University level, through questionnaires; (2) Faculty level by Quality Control Committee; (3) Lecturer's level.					
Other (as the proposer wishes to add)						