

NAME OF THE COURSE		WATERSHED HYDROLOGY				
Code		Year of study	1., I semester			
Course teacher	Vesna Denić-Jukić, PhD, Full professor	Credits (ECTS)	5.0			
	Ognjen Bonacci, PhD, Professor emeritus					
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			20	10	15	
Status of the course	compulsory	Percentage of application of e-learning	/			
COURSE DESCRIPTION						
Course objectives	The aim of the course is to give students theoretical and practical knowledge related to the problem of determining the components of the water balance of the river basin as the basic unit of any hydrological analysis. Furthermore, students will be provided with methods and procedures that are related to the analysis of each of the components of the water balance equation.					
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 shall learn the principles and applications of engineering hydrology. The student will have a good understanding of and be able to explain:</p> <ul style="list-style-type: none"> <li>-principles of hydrologic cycle and water budgeting</li> <li>-measurement and analysis of effective precipitation</li> <li>-derivation of unit hydrograph</li> <li>-runoff calculation</li> <li>-application of SCS method</li> <li>-techniques of hydrologic forecasting and simulation</li> </ul>					
Course content broken down in detail by weekly class schedule (syllabus)	<p>Water budget. Effective rainfalls. Runoff coefficient. Hydrograph form analysis and flow separation methods. Infiltration and evapotranspiration as hydrological processes. Catchment as a system. Characteristics of linear and nonlinear systems. Rainfall-runoff relationships. Theory of the unit hydrograph. Unit hydrograph estimation. Impact of nonlinearity and nonstationarity to the form of unit hydrograph. Synthetic unit hydrograph. SCS method. The unit hydrograph application for the estimation of high flows. Hydrologic methods for flood routing. Hydrologic data analysis, homogeneity and independency of data series and data series extrapolation. Determination of extreme flows. Application of time series analysis in hydrology.</p> <p>Course exercises include individual solving and elaboration of seminars associated with: the unit hydrograph, SCS method, flood routing in the open flows and hydrologic data series analysis.</p>					
Format of instruction	<input checked="" type="checkbox"/> <b>lectures</b> <input checked="" type="checkbox"/> <b>seminars and workshops</b> <input checked="" type="checkbox"/> <b>exercises</b> <input type="checkbox"/> <i>on line</i> in entirety <input type="checkbox"/> partial e-learning <input checked="" type="checkbox"/> <b>field work</b>		<input checked="" type="checkbox"/> <b>independent assignments</b> <input type="checkbox"/> multimedia <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor			
Student	Regular attendance of classes. Preparation of written assignments.					

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	2.0	Research		Practical training	
	Experimental work		Report			
	Essay		Seminar essay	1.0		
	Tests		Oral exam	1.0		
	Written exam	1.0	Project			
Grading and evaluating student work in class and at the final exam	Oral and written tests. Preparation of a written assignment. Oral and written exam.					
Required literature (available in the library and via other media)	<b>Title</b>				<b>Number of copies in the library</b>	<b>Availability via other media</b>
	1. Mc Cuen: Hydrologic analysis and design, Prentice Hall, 1989.					
	2. M.P. Wanielista, Hydrology and water quantity control, John Wiley & Sons, 1990.					
	3. V.M. Ponce, Engineering hydrology					
Optional literature (at the time of submission of study programme proposal)	1. V.T.Chow, Applied hydrology; Mc Graw Hill, 1984. 2. E.M.Shaw Hydrology in practice, Routledge, 2004.					
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)						