

Course specification: Forestry and Natural Resources Management			
Name of the subject: RIVER BASIN MANAGEMENT			
Professor/Professors: dr Vesna D. Đukić , dr Tijana Vulević , dr Nenad Marić , Katarina Lazarević			
Course status: elective course			
ECTS Number: 5			
Condition:			
Purpose of subject: The participants will acquire knowledge about integrated approach to river basin management and ways of protecting of surface water, groundwater and soil within basins. The purpose of the subject is also to inform students about proper usage of various techniques and tools such as optimisation and multicriteria analysis in river basin management			
The outcome of the subject: Good knowledge of the condition and behaviour of the natural resources of the basin and good knowledge about the strategies and policies of protecting and improving the status of natural resources of river basins including soil, surface water and groundwater resources. Students will gain knowledge of useful methods and tools for supporting river basin management and knowledge of how to use decision support techniques.			
Course content: <i>Theoretical part of course</i> Hydrological cycle and estimation of different components of water balance. Hydrological model as a tool of environmental planning and management of river basins. Review of various types of models used in different case studies. Development and applications of hydrological and hydraulic rainfall - runoff and river basin models. Application of hydrological models for estimation of the size of runoff from the basin. Application of hydraulic models for determination of water surface profiles. Sediment transport in river basins. Application of tools and concepts of Geographical Information Systems to analyze water resources in river basins. resentation and critical analysis of the results of river basin hydrological and hydraulic models. Analysis and quantification of multiple uses of water for: agriculture, hydropower, domestic, environment and other uses. Assessment of interactions between groundwater and surface water. <i>Practical part of the course:</i> Application of different hydraulic and hydrological models for different case studies. Analysis of case studies for groundwater over- xploitation and pollution. Development of soil and water resource protection strategies, and their comparison and evaluation by applying multicriteria analysis and other techniques used in decision.			
Literature: 1. US Army Corps of Engineers, Hydrologic Engineering Center (2009): HEC-GeoRAS GIS Tools for Support of HEC-RAS using ArcGIS, User's Manual 2. US Army Corps of Engineers, Hydrologic Engineering Center (2016): HEC-RAS User's Manual 3. US Army Corps of Engineers, Hydrologic Engineering Center (2018): Hydrologic Modeling System HEC-HMS, User's Manual 4. Đukić, V., Radić, Z. (2016) Sensitivity analysis of a Physically Based Distributed Model. Water Resources Management 30: 1669-1684. DOI 10.1007/s11269-016-1243-8. http://link.springer.com/article/10.1007/s11269-016-1243-8 5. Đukić, V., Radić, Z. (2014): GIS Based Estimation of Sediment Discharge and Areas of Soil Erosion and Deposition for the Torrential Lukovska River Catchment in Serbia, Water Resources Management 28 (13), p.4567-4581. http://link.springer.com/article/10.1007/s11269-014-0751-7 6. Vulevic, T., Dragovic, N., Kostadinov, S., Belanovic Simic, S., Milovanovic, I. (2015): Prioritization of Soil Erosion Vulnerable Areas Using Multi - Criteria Analysis Methods. Polish journal of environmental studies 24 (1), 317-323.			
Number of hours of active classes	Theoretical part of course:2	Practical part of the course:2	
Methods of teaching Lectures, exercises, seminar papers			
Assessment of knowledge (maximum number of points 100)			
Pre-exam obligations	points	Final exam	points
Activities during lectures	10	Written exam	25
Practical lectures	10	Oral exam	20
Tests	15		
Seminar papers	20		