

Prerequisite status: Advanced geographic information system Database management Digital earth models	Unit Type: Theoretical/practical	The number of units: 2	Name of the lesson: GIS modeling in water and soil studies
Type of additional practical training: Has it <input checked="" type="checkbox"/> does not have <input type="checkbox"/> Science travel <input type="checkbox"/> Laboratory <input checked="" type="checkbox"/> Workshop <input type="checkbox"/> Seminar <input type="checkbox"/>		The number of hours: 51	Expert professor to teach: GIS
Goals: Familiarizing students with decision support systems and spatial multi-criteria analysis methods			
Headlines 1- An overview of the geographic information system and its common spatial analyzes in water and soil studies 2- Application of spatial multi-criteria decision analysis in water and soil studies 3- Getting familiar with and using standard modeling languages such as UML and its various structures in place-based models 4- Fuzzy logic, principles, and concepts 5- Fuzzy inference system and its application in water and soil studies 6- Extraction of physiographic characteristics of watersheds 7- Spatial modeling of the vulnerability of aquifers 8- Spatial modeling of precipitation and runoff 9- Spatial modeling of water balance 10- Preparation of land cover and land use maps 11- Assessment of environmental effects using GIS			
Reference 1- Alireza Qaragozlu, (2004), GIS and environmental assessment and planning, Mapping Organization Publications. 2- Dixon B. and Uddameri V., 2016, GIS and Geocumputation for water resource science and engineering, John Wiley & Sons, Ltd. 3- Francis J. Pierce and clay D., 2007, GIS application in agriculture, CRC Press.			