Study program: Master academic studies Environmental Risk Management (MASERM)

Type and level of studies: Master academic studies, II level

Subject name: Environmental Risk Modelling	**Subject code**	6U1MRZ

Professor: dr Dušan Mijović, assistant professor

Subject status: Mandatory

Number of ECTS: 7

Condition: none

Subject goal

Students will learn how to define environmental risk-system through the components that make it also the methods of the analysis and synthesis to create the algoritham ehere the conceptual model will transform into a numerical model. There will be used GIS techonologies as well as the available satelite record in forming spatial model in which environmentally hazardous phenomenon may occur or has occurred.

Subject outcome

Students learn how to evaluate and breakdown environmental risk to components. The formation of an algorithm that represents an environmental risk during its creation, events and consequences that arise after that. The formation of the model and giving an approximate estimation of the consequences and reactions of the environment and human population.

Subject content

Theoretical classses

Introduce students to the concept of "system" and the parsing algorithm on system components, comparison with the real risk to the environment (each environmental risk is essentially a system for yourself). Forming algorithm according to the principle: 1. The state of the system prior an accident; 2. State during the accident with the analysis of the situation shortly before and shortly after the accident; 3. The state of the system after an accident 4. Reaction of the environment on risk-accident 5. Reaction of the human population on risk-accident. Forming a simple equation of the representative of risk. Specific examples related to natural disasters that can threaten the environment: 1. Earthquake in Skopje 1963. 2. Possible volcanic eruption of Yellowstone; 3. Massive ejection of solar material. Specific examples related to antropogne environmental disasters: 1. Groundwater transport of pollutants. 2. Disaster of the Vajont dam in 1963 in Italy, 3. Nuclear catastrophe in Chernobyl in 1986. With interactive teaching (students come prepared to class) system algoritham-model for the before mentioned and well-known phenomena will be formed. Transformation from conceptual to numerical model. Analysis of the reaction of socio-political organizations in the bafore mentioned cases.

Practical classes

Practices are organised in the data center using available software packages for training students for work and understanding of algorithms and models.

Literature:

1. N. Krešić, S. Vujasinović, I. Matić, 2006.: Remedijacija podzemih voda i geosredine. Univerzitet u Beogradu.
2. Dejan Filipović: *Modelovanje zagađivanja životne sredine gradova – monitoring i zaštita*, Beograd, 1999.
3. J. Schnoor: *Environmental Modelling*, John Wiley, New York, 1996.
4. Internet kao izvor literature

Number of active teaching classes				Other classes
Lectures: 2 (30)	Practices:2(30)	Other class forms: 1(15)	Study research paper:	

Teaching methods

During lectures and practices, the students will analyze algorithms and models of concrete situations, risk and processes, they will make concepts of the models of this processes and they will make predictions of the further development of the phenomenon. There is 37.5 hours of interactive teaching provided, colloqium, written exam and oral exam.

Knowledge evaluation (maximum number of points is 100)

Pre-exam obligations	**points**	Final exam	*points*
Activity during lectures	10	Written exam	30
Practical classes	30	Oral exam	20
colloquium	10		