



Course ID: HRH410	Course name: RADIOACTIVE WASTE MANAGMENT		
Cycle: FIRST	Year: FOURTH	Semester: VIII	ECTS credits: 3
Course status: ELECTIVE		Total course hours: 45 Lectures: 30 Laboratory: 15	
Teaching participants:	Teachers and associates with expertise in the field to which the subject belongs		
Prerequisite for enrollment:	Radiochemistry		
Course aims:	This module seeks to provide the theoretical and applied knowledge base that will underpin a student's potential future professional activity in this field and includes sources and types of radioactive waste, principles and techniques of radioactive waste disposal, as well as safety standards for protection against ionizing radiation and radiation sources		
Thematic course units:	Radioactivity and impact of radioactivity on environment Sources of radioactive waste Radioactive waste classification Types of radioactive waste Basic approaches and principles of radioactive waste management Storage of radioactive waste, transport of radioactive waste Safety assessment of stored radioactive waste Waste encapsulation and immobilization and the multi-barrier concept for radioactive waste disposal Application of cements and cementation technologies for waste immobilisation Application of glasses and vitrification technology for waste immobilisation Application of ceramics and ceramification techniques for waste immobilisation Decontamination Nuclear waste disposal concepts Geological repositories for radioactive waste isolation Basics of nuclear waste regulation, legal framework, and responsible bodies		
Learning outcomes:	Knowledge: After the course the student will be able to: Demonstrate knowledge and understanding of types and sources of radioactive waste, associated hazards and impact of radioactivity on environment; understand the general approaches to nuclear waste management; have a knowledge about techniques of nuclear waste processing to give waste forms suitable for storage and ultimate disposal; know methods of the encapsulation and immobilisation of waste in a range of waste forms. Skills: Students will obtain the scientific knowledge on waste management and acquire problem solving abilities.		

	Competences: Students will know the relation between the disposal engineering and natural environment and explain basic science and technologies in the waste disposal, e.g., vitrified glass, bentonite, buffer material, canister, over pack etc. The students will master the operational techniques and strategies for the entire process of radioactive waste management.
Teaching methodology:	Auditory lectures, Laboratory exercises
Assessment methods and grading system¹:	Grading criteria
	Criteria Maximal score Required score
	1. Class attendance 5 3
	2. Class activities 10 5
	3. Midterms 45 25
	4. Final exam 40 22
	Total 100 100
	Scores and grading
	Score Grade (B&H) Grade (ECTS)
	< 55 5 F, FX
55-64 6 E	
65-74 7 D	
75-84 8 C	
85-94 9 B	
95-100 10 A	
Literature²:	<p>Supplementary literature:</p> <ol style="list-style-type: none"> 1. D.D. Kelly (2006), Radioactive Waste,Hidden Dangers (Extreme Environmental Threats),The Rosen Publishing Group 2. James Saling,(2001), Radioactive Waste Management, 2n edition, CRP Press 3. Raymond LeRoy Murray, Kristin L.Manke (2003), Understanding radioactive waste, 5th edition, Battelle Press, USA

¹ The grading structure for each subject is determined by the Council of the organizational unit before the beginning of the academic year in which the subject is taught as per Article 64, paragraph 6 of the Law on Higher Education of Sarajevo Canton

² The Senate of the higher education institution, as an institution, or the Council of the organizational unit of the higher education institution, as a public institution, determines by a special decision, which is published on its website before the beginning of the academic year obligatory, mandatory and recommended textbooks and manuals, as well as other recommended literature based on which exams are prepared and taken as per Article 56, paragraph 3 of the Law on Higher Education of the Sarajevo Canton