Course ID:HRHI03	**Course name: DETERMINATION OF RADIONUCLIDES IN ENVIRONMENTAL SAMPLES**		
Cycle: SECOND	**Year: FIRST**	**Semester: I**	**ECTS credits: 5**
Course status: ELECTIVE		**Total course hours: 60** Lectures: 45 Laboratory: 15	
Teaching participants:	**Teachers and associates with expertise in the field of Radiochemistry**		
Prerequisite for enrollment:	Radiochemistry		
Course aims:	Introducing students to methods and techniques for determining (monitoring) radionuclides in environmental samples		
Thematic course units:	Radionuclides in environment The most commonly determined radionuclides and their properties Monitoring program Detection of radiation in environmental samples Sampling and sample preparation Determination of radionuclide content in air (aerosol) Determination of radionuclide content in drinking water, groundwater and surface waters Determination of radionuclides in arable and uncultivated soil Determination of radionuclides in biological samples Regulatory (BiH, EU) of interest for monitoring radioactivity in environment		
Learning outcomes:	Knowledge: Student will know to understand the origin of radionuclides in the environment; Students will know how to explain the types and properties of radionuclides that are most often determined in environmental samples; Students will understand and know to apply methods of detection and identification of radionuclides in environmental samples Skills: Students will be able to conduct quantitative and qualitative analysis of environmental samples from the aspect of radionuclide presence; Propose a plan for monitoring the examined location; Students will know to perform sampling of a specific sample from the environment Competences: Students will be able to use a new knowledge in identifying radiation risks in their living and working environment, and to take protection measures in case of radiation exposure; Based on the results of the analysis, student will be able to assess the impact of radionuclides on the environment		

Teaching methodology: Auditory lectures; Laboratory exercices; Field exercises

Assessment methods and grading system[1]:

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	55

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

Literature[2]:

Supplementary literature:

1. Pavel Povinec (2007). Analysis of Environmental Radionuclides, Volume 11,1st Edition, Comenius University, Bratislava, Slovakia
2. David A. Atwood (2010). Radionuclides in the Environment, John Wiley & Sons, London
3. V.Valkovic: Radioactivity in the environment, 1st Edition,
4. Elsevier 2000
5. Klaus Froehlich (2010). Environmental Radionuclides, 1st Edition, Elsevier, UK
6. Mirza Nuhanović (2016). Uran u okolinskim uzorcima, Teorijske osnove sa praktikumom, PMF, Sarajevo
7. Mirza Nuhanović (2022). Osnove gamaspektrometrije sa praktikumom, PMF, Sarajevo

[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