1. GENERAL INFORMATION				
1.1. Course teacher	Tenured Professor Nediljka Gaurina-Međimurec, PhD; Assistant Professor, Karolina Novak Mavar, PhD		1.6. Year of the study	II.
1.2. Name of the course	Waste Management in Petroleum Engineering		1.7. ECTS credits	5
1.3. Associate teachers	-		1.8. Type of instruction (number of hours L + E + S + e-learning)	42L+0E+15S+3e-learning
1.4. Study programme (undergraduate, graduate, integrated)	graduate		1.9. Expected enrolment in the course	15
1.5. Status of the course	☐ mandatory	☒ elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	level 3, 5% online
2. COUSE DESCRIPTION				
2.1. Course objectives	Acquiring knowledge necessary for hazardous and non-hazardous waste management from the process of oil and gas exploration and production processes, in line with legal requirements, and in order to prevent and to reduce waste quantities and toxicity.			
2.2. Enrolment requirements and/or entry competences required for the course	Completed lectures *Drilling engineering* and *Oil and gas production engineering*, from the 1st year of study.			
2.3. Learning outcomes at the level of the programme to which the course contributes	Assess the environmental impact of petroleum engineering and geoenergy engineering; Plan the methods and procedures for avoiding or minimizing environmental impact of petroleum engineering and geoenergy engineering activities.			
2.4. Expected learning outcomes at the level of the course (3 to 10 learning outcomes)	Distinguish legal regulations in the field of waste management at O&G E&P onshore and offshore activities; Apply the "circular economy" concept; Analyse the hierarchy of waste management and BAT technology; Compare different waste management methods in petroleum industry; Planning remediation of mud pits and hydrocarbon-contaminated sites; Design a process for permanent disposal of petroleum waste into deep wells.			
2.5. Course content (syllabus)	Legislation in the field of waste management; Hierarchy in waste management and possibilities of applying the "circular economy" concept; Waste treatment procedures (chemical-physical, biological, thermal, waste disposal, waste conditioning, hazardous waste list); Waste management in national practice (mud pits, facilities for waste fluid regeneration); Toxicity of waste; Disposal of waste in or on the ground; Waste solidification/stabilization; Thermal treatment of waste; Waste disposal into caverns; Waste management during offshore exploration and production activities.			

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2.6. Format of instruction:	☒ lectures ☒ seminars and workshops ☐ exercises ☐ online in entirety ☐ partial e-learning ☒ field work			☐ independent assignments ☐ multimedia and the internet ☐ laboratory ☐ work with mentor ☐ (other)			2.7. Comments: -			
2.8. Student responsibilities	Active participation in lectures, prepared and presented seminar paper, preliminary exam and oral exam.									
2.9. Monitoring student work	Class attendance	YES		Research		NO	Oral exam	YES		
	Experimental work		NO	Report		NO	Seminar presentation	YES		
	Essay		NO	Seminar paper	YES					
	Preliminary exam	YES		Practical work		NO				
	Project		NO	Written exam		NO	ECTS credits (total)	5		

2.10. Required literature (available in the library and/or via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Jafarinejad, S (2017.): *Petroleum Waste Treatment and Pollution Control*, Butterworth-Heineman, Elsevier.- selected chapters	NO	YES
	Wojtanowicz, A.K. (1996.): *Environmental Control Technology in Petroleum Drilling and Production, Environmental Technology in the Oil Industry*,Blackie Academic&Professional, London.- selected chapters	NO	YES
	Reis, J.C. (1996): Environmental Control in Petroleum Engineering, Gulf Publishing Company, Houston.- selected chapters.	NO	YES
2.11. Optional literature	OnePetro papers		
2.12. Other (as the proposer wishes to add)			

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