1. GENERAL INFORMATION				
1.1. Course teacher	Tenured Professor Nediljka Gaurina-Međimurec, PhD		1.6. Year of the study	I.
1.2. Name of the course	Drilling engineering		1.7. ECTS credits	6,5
1.3. Associate teachers	Teaching Assistant Petar Mijić, PhD		1.8. Type of instruction (number of hours L + E + S + e-learning)	28,5L+28,5E+0S+3e-learning
1.4. Study programme (undergraduate, graduate, integrated)	graduate		1.9. Expected enrolment in the course	30
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	Acquisition of knowledge for independent solving of engineering problems and implementation of calculations related to specific operations during drilling.
2.2. Enrolment requirements and/or entry competences required for the course	-
2.3. Learning outcomes at the level of the programme to which the course contributes	Independently solve complex engineering problems in petroleum engineering and geoenergy engineering; Design wellbore for hydrocarbon and geothermal water exploitation; Compare specific procedures and processes in petroleum engineering and geoenergy engineering; Appraise process and facility's efficiency in petroleum engineering and geoenergy engineering.
2.4. Expected learning outcomes at the level of the course (3 to 10 learning outcomes)	Apply various mathematical models used to describe the behaviour of drilling fluids and cement slurries; Perform drilling hydraulic optimization for drilling operations and casing cementing; Assess surface mud system design options and choose an appropriate solids control equipment; Analyze the causes and consequences of lost circulation and apply methods for loss zone plugging; Analyze the causes of formation fluid inflow, propose an appropriate method of well killing and perform calculations related to well pressure control; Compare different methods of coring and testing (DST) of rocks during drilling; Design well cementing and directional drilling.
2.5. Course content (syllabus)	Drilling hydraulics; Surface mud system design and its role in maintaining the given drilling fluids properties; Lost circulation; Methods of plugging loss zones; Oil well control. Blowout and kick; Causes and consequences of inflow of formation fluids;

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	Methods of well killing; Coring: equipment and methods; Rock testing: equipment and methods; Well cementing; Design of directional wells.								
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 and auditory exercises and fieldwork, writing preliminary exam, taking written and oral exams.								
2.9. Monitoring student work	Class attendance	YES		Research		NO	Oral exam	YES	
	Experimental work		NO	Report		NO	(other)		
	Essay		NO	Seminar paper		NO	(other)		
	Preliminary exam	YES		Practical work	YES		(other)		
	Project		NO	Written exam	YES		ECTS credits (total)	6,5	

2.10. Required literature (available in the library and/or via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Gaurina-Međimurec, N., Pašić, B. (2013.): *Chapter 2. Risk Due Wellbore Instability. Risk Analysis for Prevention of Hazardous Situations in Petroleum and Natural Gas Engineering* / Matanović, D.; Gaurina-Međimurec, N.; Simon, K. (Ed.). Hershey, PA, USA: IGI Global, 2013. pp 23-46.	YES	YES
	Gaurina-Međimurec, N., Pašić, B. (2013.): *Chapter 3. Risk Due Pipe Sticking. Risk Analysis for Prevention of Hazardous Situations in Petroleum and Natural Gas Engineering* / Matanović, D.; Gaurina-Međimurec, N.; Simon, K. (Ed.). Hershey, PA, USA: IGI Global, 2013. pp. 47-72.	YES	YES
	Gaurina-Međimurec, N., Pašić, B. (2013.): *Chapter 4. Lost Circulation. Risk Analysis for Prevention of Hazardous Situations in Petroleum and Natural Gas Engineering* / Matanović, D.; Gaurina-Međimurec, N.; Simon, K. (Ed.). Hershey, PA, USA: IGI Global, 2013. pp 73-95.	YES	YES
	Adams, N.J. (1985.): *Drilling Engineering-A Complete Well Planning Approach*, Penn Well Books, Tulsa. - selected chapters	NO	YES
	Lubinski, A. (1988.): *Development in Petroleum Engineering*, Gulf Publishing Company, Houston. – selected chapters	NO	YES
	Smith, D.K. (1990.): *Cementing*, SPE Monograph Series. - selected chapters	NO	YES

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	Khalifeh, M; Arild Saasen, A. (2020.); *Introduction to Permanent Plug and Abandonment of Wells*, Springer. – selected chapters	NO	YES
	Bourgoune, A.T., Chenevert, M.E., Milheim, K.K., Young, S.S.Jr. (1991.): *Applied Drilling Engineering*, SPE Textbook Series. - selected chapters	YES	YES
	Drilling data handbook (1999.). Institut Francais du petrole, API Standards, Engineering essentials of modern drilling.	NO	YES
2.11. Optional literature	McLennan, J. et al. (1997.): *Underbalanced Drilling Manual*, Gas Research Institute, Chicago, Illinois.		
2.12. Other (as the proposer wishes to add)	OnePetro papers		

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