



University of  
Zagreb



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**FACULTY OF MINING,  
GEOLOGY AND PETROLEUM  
ENGINEERING**



1. GENERAL INFORMATION			
1.1. Course teacher	Assistant professor Luka Perković, PhD		1.6. Year of the study
1.2. Name of the course	Energy planning		1.7. ECTS credits
1.3. Associate teachers	Teaching assistant Amalia Lekić Brettschneider, MSc		1.8. Type of instruction (number of hours L + E + S + e-learning)
1.4. Study programme (undergraduate, graduate, integrated)	graduate		1.9. Expected enrolment in the course
1.5. Status of the course	<input type="checkbox"/> mandatory	<input checked="" type="checkbox"/> elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)
II.			
4			
30+20E+0S+10e-learning			
15			
level 3, 16,67% online			
2. COUSE DESCRIPTION			
2.1. Course objectives	The course Energy planning is set in graduate study as a part of an elective module, and it's goal is to introduce students with comprehensive analysis of existing and future energy systems, with special emphasis on techno-economic analysis, energy efficiency, sustainability, pollutant emissions and structure of primary energy. Energy systems under investigation are national energy systems, as well as small-scale distributed energy systems. The analysis is done by running simulations of a different scenarios in energy planning software EnergyPLAN.		
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 geoenery engineering; Appraise the process and a facility's efficiency in petroleum engineering and geoenery engineering; Assess the environmental impact of petroleum engineering and geoenery engineering; Plan the methods and procedures for avoiding or minimizing environmental impact of petroleum engineering and geoenery engineering activities; Supervise projects in petroleum engineering and geoenery engineering.		
2.4. Expected learning outcomes at the level of the course (3 to 10 learning outcomes)	Explain the role and importance of energy planning in energetics; Describe existing and upcoming technologies in energy to integrate renewable energy sources and reduce CO <sub>2</sub> emissions; Analyse national energy system of the Republic of Croatia from the point of view of primary energy consumption, and final consumption by sectors, CO <sub>2</sub> emissions, etc.; Create national energy system in one of the energy planning programs; Critically analyse simulation results of national energy system of the Republic of Croatia obtained in one of the energy planning programs; Devise structure of energy system for simple energy system; Assess economic viability of project using one of the methods based on the results of energy planning;		



	Analyse the impact of the market price of energy (electricity, gas and heat) on the structure and management of energy systems.								
2.5. Course content (syllabus)	Give the student basic and professional knowledge in the field of energy planning with an emphasis on planning sustainable energy systems; Provide basic and expert knowledge of mapping energy resources and energy needs; Development of own simplified energy flows balancing model for an arbitrarily selected energy system, as well as the national energy system of the Republic of Croatia, including storage systems for various forms of energy; Modeling of energy systems in one of the energy planning programs (for example EnergyPLAN); Objectively assess the profitability of investments in energy systems through techno-economic analysis.								
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> online in entirety <input checked="" type="checkbox"/> partial e-learning <input type="checkbox"/> field work			<input checked="" type="checkbox"/> independent assignments <input checked="" type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)			2.7. Comments:		
2.8. Student responsibilities	Regular class attendance and active participation in lectures and exercises, taking preliminary or written exam, taking an oral exam.								
2.9. Monitoring student work	Class attendance	YES		Research	YES		Oral exam	YES	
	Experimental work		NO	Report		NO			
	Essay		NO	Seminar paper	YES				
	Preliminary		NO	Practical work		NO			
	Project		NO	Written exam		NO	ECTS credits (total)		4
2.10. Required literature (available in the library and/or via other media)	<b>Title</b>						<b>Number of copies in the library</b>	<b>Availability via other media</b>	
	<i>EnergyPLAN Documentation</i> (November 2018 - online)						NO	YES	
	Perković, L.: <i>Energy conversion</i> , script						NO	YES	
	Perković, L.: <i>Solving practical problems in energy planning</i> , script						NO	YES	
2.11. Optional literature									
2.12. Other (as the proposer wishes to add)									