

## GDAŃSK UNIVERSITY

## Subject card

Subject name and code	Management and economics of nuclear power plants, PG_00065887								
Field of study	Nuclear Engineering								
Date of commencement of studies	February 2026		Academic year of realisation of subject			2025/2026			
Education level	second-cycle studies		Subject group			Obligatory subject group in the field of study			
						Subject group related to scientific research in the field of study			
Mode of study	Full-time studies		Mode of delivery			at the university			
Year of study	1		Language of instruction			Polish			
Semester of study	1		ECTS credits			3.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering -> Wydziały Politechniki Gdańskiej							> Wydziały	
Name and surname	Subject supervisor	dr inż. Marcin Jaskólski							
of lecturer (lecturers)	Teachers								
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Project		Seminar	SUM	
of instruction	Number of study hours	15.0	0.0	0.0	15.0		0.0	30	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study		SUM	
	Number of study hours	30		8.0		37.0		75	
Subject objectives	The aim of the course for students is to acquire knowledge and skills in the field of economic evaluation of investments in a nuclear power plant.								
Learning outcomes	Course outcome [K7_U04] creatively designs or modifies, either entirely or at least in part, nulear power systems, considering both technical and non-technical aspects, estimating costs and utilizing design techniques appropriate for tasks within the scope of Nuclear Power Technologies		Subject outcome			Method of verification			
			Performs technical and economic analysis for a nuclear power plant			[SU1] Assessment of task fulfilment			
	[K7_K12] is ready for fullfiling social commitement and initation of actions for public interest including entrepreneurial thinking and acting		Discusses the profitability of building a selected nuclear power plant.			[SK4] Assessment of communication skills, including language correctness			
	[K7_U03] identifies and formulates task specifications in the scope of energy processes and systems including non-standard problems and taking into consideration their non-technical aspects.		Calculates the average annual costs and cost of electricity from a nuclear power plant.			[SU1] Assessment of task fulfilment			
	[K7_W13] explains the main principles of individual and teamwork organization, including various forms of entrepreneurship utilizing knowledge from the field of engineering and technical sciences and disciplines relevant to the course of study		Presents the main assumptions and results of the technical and economic analysis of the nuclear power plant.			[SW2] Assessment of knowledge contained in presentation			

Lecture:						
1. Discounting time-varying cash flows						
2. Calculation of capital costs (depreciation, loans)						
3. Static and dynamic methods for assessing the profitability of investments in the energy sector						
4. Annual energy generation costs						
5. Investment outlays for the construction of a nuclear power plant and their structure						
6. Calculation of the average unit cost of energy						
7. Factors determining the profitability of a nuclear power plant						
8. Market mechanisms of support / investment incentives						
9. Non-market business models						
10. Nuclear energy in models of planning the development of energy systems						
Project:						
1. Carrying out a technical and economic analysis for a selected case of a nuclear power plant						
Subject passing criteria	Passing threshold	Percentage of the final grade				
Presentation	60.0%	20.0%				
Lecture test	60.0%	45.0%				
Project	60.0%	35.0%				
d reading Basic literature 1. Zieliński A.S. (red.) (2024), Elektrownie jądrowe w nowocze gospodarce, Wydawnictwo Naukowe PWN, Warszawa 2. Kamrat, W. (2004). <i>Metody oceny efektywności inwestowa</i> <i>elektroenergetyce</i> . 3. Jaskólski M. (2023): Modelowanie systemów energetyczny wytwarzania energii elektrycznej i ciepła do celów planowania wybrane zagadnienia. Gdańsk: Politechnika Gdańska. ISBN 978-83-7348-883-0						
	Lecture: 1. Discounting time-varying cash fl 2. Calculation of capital costs (dep 3. Static and dynamic methods for 4. Annual energy generation costs 5. Investment outlays for the const 6. Calculation of the average unit c 7. Factors determining the profitab 8. Market mechanisms of support / 9. Non-market business models 10. Nuclear energy in models of pla Project: 1. Carrying out a technical and ecc Subject passing criteria Presentation Lecture test Project Basic literature	Lecture:         1. Discounting time-varying cash flows         2. Calculation of capital costs (depreciation, loans)         3. Static and dynamic methods for assessing the profitability of inves         4. Annual energy generation costs         5. Investment outlays for the construction of a nuclear power plant at         6. Calculation of the average unit cost of energy         7. Factors determining the profitability of a nuclear power plant         8. Market mechanisms of support / investment incentives         9. Non-market business models         10. Nuclear energy in models of planning the development of energy         Project:         1. Carrying out a technical and economic analysis for a selected cas         Subject passing criteria       Passing threshold         Presentation       60.0%         Project       60.0%         Basic literature       1. Zieliński A.S. (red.) (2024), E         2. Kamrat, W. (2004). Metody c       elektroenergetyce.				

	Supplementary literature	<ol> <li>K. Shirvan, Overnight Capital Cost of the Next AP100, MIT-ANP- TR-193, MIT, Cambridge, MA, March 2022</li> <li>K. Shrivan, 2024 Total cost projection of next AP1000, MIT-ANP- TR-201, July 2024</li> <li>Ł. Sawicki, B. Horbaczewska, Role of the state in implementation of strategic investment projects: The SaHo Model for nuclear power, International Journal of Management and Economics 2021; 57(4): 343359</li> <li>Modelling Nuclear Energy Systems with MESSAGE: A User's Guide https://www.iaea.org/publications/10861/modelling-nuclear-energy- systems-with-message-a-users-guide</li> </ol>		
	eResources addresses			
Example issues/ example questions/ tasks being completed	<ol> <li>Calculate the annual electricity production for the given values of installed capacity, degree of utilization and own needs coefficient.2. Calculate discounted investment costs for the construction of a nuclear power plant.3. Calculate the annual costs of a nuclear power plant.4. Calculate revenues from the sale of electricity.</li> <li>Determine the annual gross and net profit.6. Determine the NPV, IRR and DPBP indicators for the selected nuclear power plant project.</li> </ol>			
Work placement	Not applicable			

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