

Software Engineering		Software Engineering				
I						
demicki						
cjonne						
rwszego stopnia						
owy						
7						
cr	(x egzamin, + zaliczenie, # projekt)					punkty ECTS
	razem	wykłady	ćwiczenia	laboratoria	projekt	
	40x	12		28+		3.0
1		12		28		3.0
my i struktury danych - K_U05, K_U07, K_U17, K_W05						
anych - K_U05, K_U06, K_U07, K_U17, K_W05, K_W08						
owanie obiektowe - K_U05, K_U07, K_U17, K_W05, K_W08, K_W09						
adzenie do programowania - K_U05, K_U07, K_U14, K_U16, K_U17, K_W05, K_W06, K_W08, K_W09						
/ Kryptologia i cyberbezpieczeństwo / wszystkie specjalności						
regorz Bliźniuk						
ZIO						
es combined with multimedia presentations. Laboratory exercises consist of team-based project work g UML 2.x.						
estones: System requirements documentation, analysis documentation, design documentation, and ance test documentation.						
Semestr IV temat/tematyka zajęć		liczba godzin				
		wkl.	ćw.	lab.	prj.	sem.
roduction: Software responsibility, software development ess, evolution of programming languages and techniques, ns and domain of software engineering, software lifecycle els (Learning Outcomes: W1, W2, W3, W4, W5)		2		6		
Language: Origins, fundamental models, comparison with cted other graphical modeling languages for information ems (Learning Outcomes: W1, W2, W3, W4, W5, U1, U2, U3)		2		4		
irements Definition Phase: Importance and activities of the irements phase, types of requirements, requirements eling, requirement verifiability, scope of requirements mentation, application of Artificial Intelligence (AI) tools in ifying and defining software requirements (Learning omes: W1, W2, W3, W4, W5, U1, U2, U3).		2		4		
mation System Analysis Phase: Essence of the analysis e, analysis models, application of AI tools in system analysis, ysis phase documentation (Learning Outcomes: W1, W2, W3, U1, U2, U3).		2		6		
tem Design and Testing Phases: Essence of the design phase, gn models, design documentation, application of AI tools in m design; Essence of the testing phase, test types, test and test execution documentation, application of AI in ware testing (Learning Outcomes: W1, W2, W3, W4, U1, U2,		2		8		
duction to Team Management in IT Projects (Learning omes: W3, W4, W5).		2				
Razem		12		28		
wa:						
mmerville; Software Engineering; 10th Edition; Pearson, 2015; ISBN 9780133943030;						
Booch, James Rumbaugh, Ivar Jacobson; The Unified Modeling Language User Guide; 2nd Edition , n-Wesley, 2005; ISBN 0321267974						
arman; Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and e Development; 3rd Edition. Pearson, 2004; ISBN 0131489062						

	uzupełniająca: • Bernd Bruegge, Allen Dutoit; Object-Oriented Software Engineering Using UML, Patterns, and Java; 3rd edition; Pearson; ISBN: 978-1-292-02401-1 • Tom Taulli; AI-Assisted Programing. Better Planning, Codeing, Testing and Deployment; O'Reilly Media; 2024; ISBN-9781098164560 • ed. Meir Kalech, Rui Abreu, Mark Last; Artificial Intelligence Methods for Software Engineering; World Scientific, 2021, https://doi.org/10.1142/12360, ISBN: 978-981-12-3991-5		
Efekty uczenia się	Symbol	Efekty kształcenia	odniesienie do efektów kształcenia dla kierunku
	U1	Student is able to execute a design task applying software engineering principles, taking into account a critical evaluation of existing solutions as well as appropriate methods and tools for analysis, design, programming, and documentation	K_U05
	U2	Student is able to participate in team design, implementation, and testing, and practically apply principles of deployment, maintenance, enhancement, and retirement of IT systems, as well as perform a preliminary economic evaluation of these actions	K_U07
	U3	Student is able to independently plan and execute lifelong learning and guide others in this regard; gather information from literature, databases, and other sources; synthesize and analyze information	K_U17
	W1	Student knows and understands fundamental concepts of computer science, theory of algorithms and data structures, data management, as well as high- and low-level programming paradigms and techniques	K_W05
	W2	Student distinguishes classes and types of IT systems, knows tools and methods for designing such systems and developing software operating under their control	K_W06
	W3	Student knows and understands, at an advanced level, models, methods, methodologies, and tools for IT system development (analysis, design, implementation, and testing in initial lifecycle phases)	K_W08
	W4	Student knows and understands, at an advanced level, methods, best practices, and methodologies for deployment, maintenance, enhancement, and retirement of IT systems (final lifecycle phases)	K_W09
	W5	Student knows and understands fundamental dilemmas of modern civilization, with a particular focus on issues related to computer science and IT	K_W20
Metody i kryteria oceniania (sposób sprawdzania osiągnięcia przez studenta zakładanych efektów uczenia się)	• No exam exemptions are provided. The exam consists of a single-choice test with 10 questions (3 options per question). Each correct answer = 1 point; incorrect = 0 points. Grading scale: 0-4 pts (2.0), 5-6 pts (3.0), 7 pts (3.5), 8 pts (4.0), 9 pts (4.5), 10 pts (5.0). • Admission to the exam requires passing the laboratory course. Laboratory evaluation is based on team-developed project documentation (Requirements, Analysis, Design, Acceptance Testing). Short written/oral quizzes during labs may contribute to the final lab grade. • Incentive System: Extra points added to the exam score based on lab performance: Lab grade 5.0 → +3 points on exam, Lab grade 4.5 → +2 points on exam, Lab grade 4.0 → +1 point on exam; Lab grades 3.0-3.5 → 0 extra points;		
Bilans ECTS (nakład pracy studenta)	SEMESTR 4		
	Aktywność	Obciążenie studenta	
		Liczba godzin	Liczba ECTS
	Udział w wykładach	12	0.6
	Udział w laboratoriach	28	1
	Udział w ćwiczeniach		
	Udział w seminariach		
	Samodzielne studiowanie tematyki wykładów		
	Samodzielne przygotowanie do laboratoriów	30	1
	Samodzielne przygotowanie do ćwiczeń		
	Samodzielna realizacja projektu		
	Realizacja projektu		
	Udział w konsultacjach	2	
	Przygotowanie do egzaminu	30	0.4
	Przygotowanie do zaliczenia		
	Udział w egzaminie / kolokwium		
	Sumaryczne obciążenie pracą studenta	104	3
	Zajęcia z udziałem nauczycieli	42	1.6
	Zajęcia powiązane z działalnością naukową	70	2.6
	Zajęcia o charakterze praktycznym	58	2

Zajęcia realizowane z wykorzystaniem metod i technik kształcenia na odległość	SEMESTR 4		
	Rygor	Liczba godzin	Liczba ECTS
	Wykłady		
	Laboratoria		
	Ćwiczenia		
	Projekty		
	Seminaria		
	Razem		

autor

kierownik jednostki organizacyjnej
odpowiedzialnej za przedmiot

dr inż. Grzegorz Bliźniuk
tytuł, stopień naukowy, imię, NAZWISKO, podpis

dr hab. inż. Nowicki Tadeusz
tytuł, stopień naukowy, imię, NAZWISKO, podpis