



Subject card

Subject name and code	Software Engineering, PG_00063885						
Field of study	Informatics						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2025/2026		
Education level	first-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	2	Language of instruction			Polish		
Semester of study	4	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Software Engineering -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Aleksander Jarzębowicz					
	Teachers	dr inż. Aleksander Jarzębowicz dr inż. Maciej Kucharski mgr inż. Małgorzata Pykała mgr inż. Rafał Dobrosielski mgr inż. Natalia Tyszka					
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	E-learning hours included: 0.0						
	eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=4477 Moodle ID: 4477 Inżynieria Oprogramowania 2025/2026 (semestr letni) https://enauczanie.pg.edu.pl/2025/course/view.php?id=4477						
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	60	2.0		13.0	75	
Subject objectives	The course is focused on introducing to students the aspects of industrial software development: large systems, compliant to requirements of a specific customer, supporting business goals, providing a required level of quality characteristics, produced and maintained by large developers teams.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U03] can design, according to required specifications, and make a simple device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	The student develops analytical and design models of IT system using CASE (Computer Aided Software Engineering) software supporting tools.	[SU1] Assessment of task fulfilment
	[K6_W44] knows and understands, to an advanced extent, architecture, design principles and methods of hardware and software support for local and distributed information systems, including computing systems, databases, computer networks and information applications, as well as the principles of human-computer interaction, the operation and evaluation criteria of data processing, storage and transfer methods, including computational algorithms, artificial intelligence and data mining as well as standards and methods of IT systems administration, monitoring of processes and robustness to undesirable phenomena and activities	The student understands what IT system's architecture is, knows what issues are essential during architectural design.	[SW1] Assessment of factual knowledge
	[K6_W10] knows and understands to an advanced degree the basic processes occurring in the life cycle of equipment, objects and technical systems, as well as methods of supporting processes and functions, specific to the field of study	The student knows software lifecycle models and software development methodologies.	[SW1] Assessment of factual knowledge
	[K6_U09] can carry out a critical analysis of the functioning of existing technical solutions and assess these solutions, as well as apply experience related to the maintenance of technical systems, devices and facilities typical for the field of studies, gained in the professional engineering environment	The student develops "Vision of IT system" document that includes a critical analysis of the present state of the customer organization as well as basic requirements and restrictions of the planned IT system.	[SU1] Assessment of task fulfilment

Subject contents	<p>Course content – lecture</p> <ol style="list-style-type: none"> 1. Introduction 2. Scope and subject of software engineering. Essential motivations and concepts. 3. Preliminary software project setting. System Vision document. 4. Areas of software engineering - an overview 5. Conceptual modelling. Languages for modelling and specification. 6. Use cases 7. Object-oriented analysis using UML 8. Modelling of logical system structure: class diagrams 9. Modelling of system structure: other structural diagrams 10. Modelling system dynamics: sequence and communication diagrams 11. Modelling system dynamics: activity and state machine diagrams 12. System design: system architecture 13. System design: high-level design and class design (low level) design 14. Foundations of software quality. Metrics of object-oriented design. 15. Software reuse 16. Classical design patterns 17. Other patterns (Internet Applications patterns, analysis patterns, architectural patterns, management patterns) 18. Requirements engineering: requirements elicitation 19. Requirements engineering: requirements analysis, specification and validation 20. User interface design: motivations, terms, techniques 21. User interface design: Nielsen's heuristics and examples 22. Software testing: terms, place in software development process 23. Software testing: techniques (black/white box), levels of testing, managing tests 24. Software reviews and inspections 25. Software deployment 26. Software usage and maintenance 27. Configuration and change management 28. Classical (waterfall) software lifecycle model 29. Non-classical software lifecycles and development processes 30. Adjusting development process to particular software project context 31. Outline of software project management 32. Software development and management methodologies 33. Properties of plan-driven and agile development methodologies <p>Course content – laboratory</p> <ol style="list-style-type: none"> 1. Development of a System Vision document 2. Design of a system use case model 3. Design of an analytical UML class diagram 4. Design of dynamic UML diagrams (sequence, communication, activity, state) for selected system elements 											
Prerequisites and co-requisites	Presence during laboratory courses is mandatory. Delivery of all laboratory exercises and positive verification by tutor is required to pass the lab. Delays in delivering exercises affects the assessments. Only students who pass the lab are entitled to write the exam.											
Assessment methods and criteria	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Subject passing criteria</th> <th style="width: 33%;">Passing threshold</th> <th style="width: 33%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>Lab (assignments & tests)</td> <td>50.0%</td> <td>50.0%</td> </tr> <tr> <td>Written exam</td> <td>50.0%</td> <td>50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Lab (assignments & tests)	50.0%	50.0%	Written exam	50.0%	50.0%
Subject passing criteria	Passing threshold	Percentage of the final grade										
Lab (assignments & tests)	50.0%	50.0%										
Written exam	50.0%	50.0%										
Recommended reading	<p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>	<ol style="list-style-type: none"> 1. Pressman R., Software Engineering: a Practitioners Approach, 8th edition, McGraw-Hill, 2014 2. Sommerville I., Software Engineering, 9th edition, Addison-Wesley, 2010 3. Maciaszek L.: Requirements analysis and system design, Addison-Wesley, 2007 4. Booch G., Rumbaugh J., Jacobsen I.: The Unified Modeling Language User Guide, 2nd edition, Addison-Wesley, 2005 5. Fowler M., UML distilled, 3rd edition, Addison-Wesley, 2003 <p>No requirements</p>										
Example issues/ example questions/ tasks being completed												
Practical activities within the subject	Not applicable											

Document generated electronically. Does not require a seal or signature.