



Subject card

Subject name and code	Software engineering, PG_00045302						
Field of study	Data Engineering, Data Engineering						
Date of commencement of studies	October 2026	Academic year of realisation of subject				2027/2028	
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				English	
Semester of study	3	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				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	0.0	0.0	45
	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	45		6.0		24.0	75
Subject objectives	The aim of the course is to introduce students to analysis and design as part of overall software project activities and to enable practical learning of UML as a tool for object-oriented analysis and design of IT systems.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K6_U04] formulates logical solutions to complex or unstructured problems		Student is able to design analytical models expressing different perspectives of the considered system (functional, structural, dynamic) and to maintain consistency between such models.			[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment	
	[K6_K03] demonstrates the ability to think critically and analytically and integrates knowledge from many disciplines in order to make effective decisions		Student works on a team project dedicated to a chosen topic, using the knowledge from lectures and the available tools (modeling language, Computer Aided Software Engineering system).			[SK2] Assessment of progress of work [SK1] Assessment of group work skills	
	[K6_W01] identifies conditioning of the processes occurring in the analyzed systems and selects methods for solving them, using the accumulated knowledge and taking into account the mutual relations between the analyzed phenomena		Student understands the issues related to software development processes and IT project organization. Student can adapt project organization to the specific context of the project (problem domain, system to be developed).			[SW3] Assessment of knowledge contained in written work and projects	

Subject contents	<p>Course content – lecture</p> <ol style="list-style-type: none"> <li>1. Introduction</li> <li>2. Scope and subject of software engineering. Essential motivations and concepts.</li> <li>3. Areas and processes of software engineering</li> <li>4. Software development models (software lifecycle models) overview</li> <li>5. Software development methodologies (outline)</li> <li>6. Conceptual modelling. Languages for modelling and specification.</li> <li>7. Use cases</li> <li>8. Object-oriented analysis using UML</li> <li>9. Modelling of logical system structure: class diagrams</li> <li>10. Modelling of system structure: other structural diagrams</li> <li>11. Modelling system dynamics: sequence and communication diagrams</li> <li>12. Modelling system dynamics: state and activity diagrams</li> <li>13. Requirements engineering: requirements elicitation, analysis and validation</li> <li>14. Requirements engineering: requirements specification</li> <li>15. Design: system architecture</li> <li>16. Design: system (high-level) design and class (low-level) design</li> <li>17. Design: design patterns</li> <li>18. Design: SOLID principles</li> <li>19. Scrum method</li> </ol> <p>Course content – laboratory</p> <ol style="list-style-type: none"> <li>1. Preparation of a Vision document describing the customer organization and the system to be developed</li> <li>2. Design of a system use-case model</li> <li>3. Design of an analytical class diagram</li> <li>4. Design of selected dynamic diagrams expressing elements of the system's behavior (sequence, communication, activity and state machine diagrams)</li> </ol>											
Prerequisites and co-requisites												
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</td> <td>50.0%</td> <td>50.0%</td> </tr> <tr> <td>Exam</td> <td>50.0%</td> <td>50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Lab	50.0%	50.0%	Exam	50.0%	50.0%
Subject passing criteria	Passing threshold	Percentage of the final grade										
Lab	50.0%	50.0%										
Exam	50.0%	50.0%										
Recommended reading	<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 45%;">Basic literature</td> <td colspan="2"> <ol style="list-style-type: none"> <li>1. Pressman R., Maxim B., Software Engineering: a Practitioners Approach, McGraw-Hill, 9th edition, 2019</li> <li>2. Booch G., Rumbaugh J., Jacobsen I.: The Unified Modeling Language User Guide (2nd Edition), Addison-Wesley, 2005</li> </ol> </td> </tr> <tr> <td>Supplementary literature</td> <td colspan="2"> <ol style="list-style-type: none"> <li>1. Sommerville I., Software Engineering, 10th edition, Addison-Wesley, 2015</li> <li>2. Maciaszek L.: Requirements analysis and system design, Addison-Wesley, 2007</li> <li>3. Fowler M., Scott K.: UML distilled 3rd ed, Addison-Wesley, 2003</li> <li>4. McLaughlin B., Pollice G., West D., Head First: Object-Oriented Analysis and Design, O'Reilly Media, 2006</li> </ol> </td> </tr> <tr> <td>eResources addresses</td> <td colspan="2"></td> </tr> </tbody> </table>			Basic literature	<ol style="list-style-type: none"> <li>1. Pressman R., Maxim B., Software Engineering: a Practitioners Approach, McGraw-Hill, 9th edition, 2019</li> <li>2. Booch G., Rumbaugh J., Jacobsen I.: The Unified Modeling Language User Guide (2nd Edition), Addison-Wesley, 2005</li> </ol>		Supplementary literature	<ol style="list-style-type: none"> <li>1. Sommerville I., Software Engineering, 10th edition, Addison-Wesley, 2015</li> <li>2. Maciaszek L.: Requirements analysis and system design, Addison-Wesley, 2007</li> <li>3. Fowler M., Scott K.: UML distilled 3rd ed, Addison-Wesley, 2003</li> <li>4. McLaughlin B., Pollice G., West D., Head First: Object-Oriented Analysis and Design, O'Reilly Media, 2006</li> </ol>		eResources addresses		
Basic literature	<ol style="list-style-type: none"> <li>1. Pressman R., Maxim B., Software Engineering: a Practitioners Approach, McGraw-Hill, 9th edition, 2019</li> <li>2. Booch G., Rumbaugh J., Jacobsen I.: The Unified Modeling Language User Guide (2nd Edition), Addison-Wesley, 2005</li> </ol>											
Supplementary literature	<ol style="list-style-type: none"> <li>1. Sommerville I., Software Engineering, 10th edition, Addison-Wesley, 2015</li> <li>2. Maciaszek L.: Requirements analysis and system design, Addison-Wesley, 2007</li> <li>3. Fowler M., Scott K.: UML distilled 3rd ed, Addison-Wesley, 2003</li> <li>4. McLaughlin B., Pollice G., West D., Head First: Object-Oriented Analysis and Design, O'Reilly Media, 2006</li> </ol>											
eResources addresses												
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"> <li>• Draw a UML diagram (e.g. use case diagram, class diagram, state diagram) reflecting a given description of system requirements.</li> <li>• Describe a given software development model and discuss its strong and weak aspects.</li> <li>• Enumerate and describe requirements specification techniques.</li> </ul>											
Practical activities within the subject	Not applicable											

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