COURSE UNIT DESCRIPTION

Course unit title	Course unit code
Problem-Based Project	**ITPBL**

Lecturers	Department where the course unit is delivered
Coordinator: lector dr. Agnė Brilingaitė **Other lecturers:** lecturers of the department	Department of Computer Science II Faculty of Mathematics and Informatics Vilnius University

Cycle	Type of the course unit
First	Compulsory in the innovative studies

Mode of delivery	Semester or period when the course unit is delivered	Language of instruction
Individual work combined with lectures and seminars	3rd semester	Lithuanian and English

Prerequisites

Number of ECTS credits allocated	Student's workload	Contact hours	Individual work
15	390	56	334

Purpose of the course unit: programme competences to be developed

Generic competences to be developed
- Ability to apply knowledge in practical situations *(BK1)*
- Knowledge and understanding of the subject area and understanding of the profession *(BK2)*
- Ability for abstract thinking, processing and analysing information *(BK3)*
- Ability to resolve problems *(BK4)*
- Ability to plan and manage tasks *(BK6)*

Subject-specific competences to be developed
- Ability to apply general methods of the program design, make and analyse software requirements *(DK1)*
- Ability to analyse the algorithmic process of the task based on the general properties of the algorithm *(DK2)*
- Ability to develop the software project (or IT service) and to write its specification *(DK3)*
- Ability to do program and IT service testing and debugging *(DK4)*
- Ability to apply project management principles *(DK6)*
- Ability to build conceptual and physical data models based on information management and data modelling principles *(DK9)*

Learning outcomes of the course unit	Teaching and learning methods	Assessment methods
Ability to understand the essence of the problem, to distinguish and analyse the requirements and restrictions, to find the existing solutions and to organize them, to foresee the possible solutions or the use of the existing solutions; ability to solve problems by applying knowledge in practice.	Inclusive lecture; discussions; project group work; individual studies of the literature; consultations; concept maps.	Project report; presentations in the seminars and participation in the debates; project defence; submission of project parts
Ability to present ideas, explain problems and their solutions fluently, clearly, and in detail in written or in oral form.	Lab work; preparation of the project report and the slides;	Project report; presentations in the

	participation in the seminars (presentations and debates); discussions.	seminars and participation in the debates; project defence
Ability to work in a group, participate in planning of the group activities, take responsibility for group work, show the initiative to distribute group tasks; ability to carry out individual or group tasks on time; knowledge of the main principles of project management.	Project work; consultations.	Group work; plans of group activities
Ability to implement the programming part of the project in the programming language(s) chosen by the group, ability to generalize the interface of own or used software and dependencies on other hardware or software; ability to write user manuals.	Project work (programming part); lab tasks; preparation of the project report (user manuals); case study.	Project report and project programming part; project defence; project parts
Ability to present the algorithmic solutions in pseudo-code or in schemas, to explain them, and to evaluate their correspondence to the programming part.	Solving practical lab exercises; peer review; preparation of the project report.	Submitted project parts; project report
Ability to foresee test cases of own software, to define and implement them.	Solving practical lab exercises; implementation of the programming part of the project; case study.	Submitted project parts; project report; project defence
Ability to choose the suitable data model, ability to apply standard data structures.	Solving practical lab exercises; inclusive lecture; case study; preparation of the project report (design part);	Project report and the programming part; presentations in the seminars and participation in the debates

Course content: breakdown of the topics	Lectures	Tutorials	Seminars	Laboratory work (LW)	Consultation during LW	Contact hours	Individual work: time and assignments	
							Individual work	Assignments
1. What is a problem-based project?	4					4	2	
2. Identification of the problem	4		4	2	3	10	6	Analysis of the presented task.
3. Information needs, search, evaluation, and application	4		2	1		7	16	Analysis of the problem and sources.
4. Brainstorming of solutions and strategies	4		4	1		9	10	Choosing the strategy for the solution..
5. Planning	2		2	1		5	10	Work planning.
6. Group work	2			1		3	4	Task distribution.
7. Problem solving	4		2	1		7	18	Individual tasks integrated into one solution.
8. Testing	4		2	1		7	18	Design of test cases and their implementation: individual tasks integrated into one solution.
9. Project presentation in oral and written forms	4					4	10	Distinguishing the main parts of the report and the presentation.
10. Project							220	Implementation of project parts.
Preparation for the exam							20	
Total	**32**		**16**	**8**		**56**	**334**	

Assessment strategy	Weight %	Deadline	Assessment criteria
Group work	10	End of the semester	Each student is evaluated individually based on the participation in the group work: active participation, demonstrated initiative, adaptability to the colleagues, and ability to choose the suitable role in a group.
Written reports	10	During the semester	Student groups submit separate parts of the project and plans of group activities (4). The group either passes or not passes.
Participation in seminars	10	During the semester	Students participate in the seminars by presenting group work (5%) and participating in the debates (5%) about other students' projects and asking questions. Each student is evaluated individually – each time the group delegates the representative. Also, each group delegates the representatives to the seminar: they are active listeners and evaluators.
Project report and programming part	50	End of the semester	Each student group submits the project report with the programming part before the strict deadline. The evaluation criteria are: 1) form and fluency of the report, included necessary parts (15); 2) the organization of the related work and correct citation/references (10%); the complexity, clearness, practical part, and significance of the problem solution.
Project defence (exam)	20	Exam session	The group present the project using slides. Each student is presents a part of the project and is evaluated individually: clear and fluent presentation (10%) and ability to answer the questions (10%).

Author	Publishing year	Title	Issue No or volume	Publishing house or Internet site
Required reading				
A. Brilingaitė	2012	Problem-Based Project. Study Guide		
Optional reading				