COURSE UNIT DESCRIPTION

Course unit title	Course unit code
Applied Object Oriented Programming	

Lecturer(s)	Department where the course unit is delivered
Coordinator: Vytautas Ašeris **Other lecturers:**	Department of Software Engineering Faculty of Mathematics and Informatics Vilnius University

Cycle	Type of the course unit
1st (BA)	Compulsory

Mode of delivery	Semester or period when the course unit is delivered	Language of instruction
Face-to-face	3 semester	Lithuanian

Prerequisites
Prerequisites: Procedural programming, Object-oriented Programming

Number of credits allocated	Student's workload	Contact hours	Individual work
5	134	68	66

Purpose of the course unit: programme competences to be developed

Purpose of the course unit – strengthen the skills and knowledge of the object-oriented programming by using C# programming language and .NET framework.

Generic competences:

- Communication and collaboration *(GK1).*
- Life-long learning *(GK2).*

Specific competences:

- Knowledge and skills of underlying conceptual basis *(SK4).*
- Software development knowledge and skills *(SK5).*
- Technological and methodological knowledge and skills, professional competence *(SK6).*

Learning outcomes of the course unit: students will be able to	Teaching and learning methods	Assessment methods
Develop applications using C# programming language, by applying OP patterns.	Lectures, problem-oriented teaching, case studies, information retrieval, literary reading, individual work, tutorials, laboratory work.	Laboratory works, results presentation, written exam (open, semi-open and close-ended questions and tasks).
Combine theory with practice by using the features of .NET framework and developing new object oriented application systems.		
Design, implementand develop applied programs.		
Develop the knowledge about data types, named and optional arguments as well as other new features of C# programming language.		

Course content: breakdown of the topics	Contact hours							Individual work: time and assignments	
	Lectures	Tutorials	Seminars	Practice	Laboratory work (LW)	*Tutorial during LW*	**Contact hours**	**Individual work**	**Assignments**
1. Overview: acquaintance with C# programing language. First C# Application. Typical OOP mistakes and how to avoid them.	2				2		**4**	**2**	
2. C# Overview for programmers with OP knowledge. Operators and control Structures. Types systems	2				2		**4**	**2**	
3. Data types. Classes, their structure and relationships. Generic types and methods. Conversions. Standard .NET interfaces. Creation of objects. Object lifecycle.	4				4		**8**	**6**	Self-study of literature to deeper knowledge. Preparation for laboratory works.
4. Working with data. Data input and output, validation. Collections. Introduction to LINQ. Serialization.	4				4	*8*	**8**	**5**	
5. C#-specific and OOP-specific properties. Delegates, anonymous types, lambda expressions. Events. Exceptions and their handling. Dependency injection.	4				4		**8**	**7**	
6. Introduction to multithreading. Acync/Await. Improvement of software systems by using .NET technologies.	4				4		**8**	**7**	
7. Working with databases. LINQ. Introduction to ORM.	4				4		**8**	**7**	
8. Reflection, dynamic typing.	2				2		**4**	**4**	
9. Overview of .NET technologies. Introduction to design patterns.	6				6		**12**	**10**	
10. Preparation for the exam and taking the final exam (written).		2					**4**	**16**	2h. tutorials, 2. exam.
Total	**32**	**2**			**32**	*8*	**68**	**66**	

Assessment strategy	Weight %	Deadline	Assessment criteria
Laboratory assignment No. 1	10	Week 7	The individual laboratory work assigned to the students covers the knowledge and skills that were developed in 1-3 topics. Additional points are added to the assessment if the work is presented before the deadline (no more than 20% of the final assessment and 5% for every preliminary week). Lateness leads to the decrease of the maximal assessment (1.0) by 20% of every delayed week. Partially finished laboratory work is evaluated accordingly.
Laboratory assignment No. 2	15	Week 11	The individual laboratory work assigned to the students covers the knowledge and skills that were developed in 4-6 topics. It is suggested for the students to perform the task by rewriting the software that was developed during the first course of the Object-oriented Programming (written in Java). By doing this the differences between Java and C# are consolidated. Additional points are added to the assessment if the work is presented before the deadline (no more than 20% of the final assessment and 5% for every preliminary week). Lateness leads to the decrease of the maximal assessment (1.5) by 20% of

			every delayed week. Partially finished laboratory work is evaluated accordingly.
Laboratory assignment No. 3	15	Week 14	The individual laboratory work assigned to the students covers the knowledge and skills that were developed in 7-8 topics. Assignments require using databases and LINQ queries to form the results. Additional points are added to the assessment if the work is presented before the deadline (no more than 20% of the final assessment and 5% for every preliminary week). Lateness leads to the decrease of the maximal assessment (1.5) by 20% of every delayed week. Partially finished laboratory work is evaluated accordingly.
Additional mini-assignments	0-10	During laboratory work	Students, willing to collect additional points, may take optional mini-assignments (one mini-assignment per one laboratory work). There will be 10 mini-assignments in total, 0.1-0.2 points each (maximum being 1.0 points).
Pristatymas paskaitos metu	0-5	During the semester	During the semester, students who expressed a will to make an oral presentation can make a presentation. Will is expressed on lecture before. Presentation is no longer than 30min, with maximum evalutation being 0.5. Single student can make no more than one presentation during the semester in a groupd of 2-4 students. No more than one presentation can be made during single lecture.
Exam in written form	60	Exam session	Exam can be taken only when total amount of points collected during the semester is 2,5 or more. Maximum 6 points can be collected, which attribute to the 60% of the final score. The exam consists of 20 open, semi-open and close-ended questions and tasks each of them is assessed between 0.1 and 2 points (accordingly to the difficulties). Questions and tasks are formulated from topics set out in lectures.

Author	**Publishing year**	**Title**	**Number or volume**	**Publisher or URL**
Required reading				
Andrew Troelsen	2010	Pro C# 2010 and the .NET 4 Platform	5th ed.	Apress
Recommended reading				
Jon Skeet	2013	C# in Depth	3rd ed.	
Tiberiu Covaci, Rod Stephens, Vincent Varallo, Gerry O'Brien	2013	MCSD Certification Toolkit (Exam 70-483)		Wrox
Dan Clark	2013	Beginning C# Object-Oriented Programming	2nd ed.	Apress