Subject code	Credits
INF2025	4

Title

.NET DUOMENÙ STRUKTÛROS

Title in English

.NET DATA STRUCTURES

Subject goal and annotation

Course provides a knowledge of doNet framework structure, conception of virtual machines and introduction to C# programming. Students are going to learn the main dotNet libraries and principles of using them in C# programs. They will be able to select proper tools for solving actual problems and to use them in designed OOP programs. The main attention is concentrated on working with higher logical level programming tools: generic collections, dictionaries, queries using delegates and predicates, handling exceptions and events, design and using of user classes and GUI tools.

Prerequisites

Introduction to programming

Relationship between the learning outcomes of the Programme and outcomes of the subject

Learning outcomes of the Programme	Learning outcomes of the subject	Criteria for measuring the achievement of learning outcomes
3. Knowledge of basic and advanced computer science and its application.	Knowledge of doNet framework structure, conception of virtual machines	Student demonstrates the ability to analyse structure and goals of dotNet framework and virtual machines.
7. Formalization and specification of real-world problems, and ability to describe them at an abstract level	Define problem formally and solve it	Student is able to formalize real-life problem and use formalization to develop solution
10. Analysis, design and development of advanced Internet systems.	Ability to prepare formal specifications and to choose tools for solving actual problems. DotNet tools for design of advanced Internet systems..	Student demonstrates skills in preparing formal specifications and in choosing dotNet tools for solving actual problems.
12. Analysis, design and development of diverse software systems.	Ability to develop and to realize object oriented projects to solve practical problems.	Skills of development and realization of object oriented projects.
13. Ability to analyse the newest trends in Internet and multimedia systems (and general computer science and digital arts) and apply them in development of novel systems.	Tools for programming and Web page design in higher logical level, Visual Development systems for Web and software projects.	Skills of using generic collections, queries, GUI and Visual Development systems for Web and software projects.
17. Personal development skills - planning of studies based on the personal needs and tendencies in industry.	Working in team, preparing and doing projects,presenting results.	Skills of organization of teamwork, distribution of jobs, presentation of projects.

Subject content

	Lecture topics and contents	Hours
1.	Structure of dotNet framework, conception of virtual machines, Common Language Infrastructure and internal data structures.	2

2.	Visual Development Systems, introduction to C# programming, tools for design of program structure.	4
3.	Dynamic and static arrays, generic lists, Streams and Files, tools for analysis of structured texts.	6
4.	Delegates, anonymous methods, lambda expressions, extension methods, queries and LINQ for queries.	6
5.	User classes and class families, encapsulation, polymorphism and inheritance.	4
6.	Interfaces, generic collections and dictionaries. Exception handling and exception classes.	4
7.	Event driven programming, graphic user interfaces (GUI), Web Forms and Web Pages.	4
	Total	**30**

Practical work content

Four groups of practical problems. All problems should be presented and described.
1.Visual Studio tools and properties, tools for development of C# program structure, manipulation with text streams, checking of errors.
2. Tools for analysis of strings, static and dynamic arrays, generic lists and queries.
3. Design and using of user classes, dictionaries and other generic collections, handling of exceptions.
4. Event driven programming and design of graphic user interfaces (GUI).

Evaluation of study results

Final written exam (50%), mid-term written exam (17%), and assessments of laboratory (practical) work (33%).

Distribution of subject study hours

Lectures	30
Laboratory work	30
Individual studies (including studies in groups, preparation for the mid-term and final exams)	60
Total	**120**

Recommended literature

No	Authors and titles	Number of copies available		
		in the Library of VMU	*in specialized publication collections at VMU*	*in other libraries*
Main literature				
1.	C# Algorithms and Data Structures. http://msdn.microsoft.com/en-us/vcsharp/aa336800.aspx			Internet
2.	C# Tutorial. http://www.devhood.com/training_modules			Internet
3.	C# Programming Guide. http://msdn.microsoft.com/en-us/library/67ef8sbd.aspx			Internet
4	Troelsen N. Pro C# 2010 and the .NET 4.5. Springer, 2012		1	2
Additional literature				
1.	C# Practical Learning. http://www.functionx.com/csharp/index.htm			
2.	A. Freeman, M.MacDonald, M.Szpuszta. Pro ASP.Net 4.5 in C#. Apress, 2012	1		

Subject prepared and coordinated by

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