

DESCRIPTION OF THE STUDY SUBJECT

Title

PROGRAMMING

Scope of the subject

Semester	Mode of studies	Structure*				Total number of hours	Number of credits	Group and type of subjects
		L	Lw	C	S			
III	Full-time	14	63	14	98	189	7	Compulsory subjects of the study field
IV	Part-time	10	32	49	98	189	7	

*L – lectures, PS – practical activities, seminars, LW – laboratory work, PR – practice, CP – course paper, C – consultations, S – self-study

Aim of the subject

To know and understand programming environments, program structure, differences between procedural (structured) and object-oriented programming, the purpose of variables, arrays, functions, procedures, modules, conditions and loop structures, differences and possibilities of using files and data bases in the program, to be able to program using high-level programming languages, to combine information, formulate and elaborate tasks, design and present universal programs.

Necessary background knowledge for studying the subject

Students shall have heard subjects basics of algorithmization, database management.

Content of the subject

Title of the topic and description of the content	Number of contact hours			S	Total number of hours
	L	Lw	C		
1. Basic elements of programming languages. Program structure. Variables, constants. Data types. Operators. Arrays. Derived data types.	2	-	2	-	4
Laboratory work and its defence No. 1. To develop a program code in which variables, arrays of logical (Boolean), the whole number (byte, integer, long), real number (single, double), symbolic (string), date (date) types are used.	-	8	-	8	16
2. Object-oriented programming characteristics and principles. Classes, methods, objects, their arrays.	2	-	2	-	4
Laboratory work and its defence No. 2. To develop a program code in which classes, class methods, objects, their arrays are used.	-	10	-	12	22
3. Branching algorithms. Choice of alternatives. Loops. Arrays.	2	-	2	-	4
Laboratory work and its defence No.3. To develop a program code in which branching algorithms, loops, search for elements of arrays and sorting are used.	-	10	-	12	22
4. Files and their usage for information processing.	2	-	2	-	4
Laboratory work and its defence No. 4. To develop a program code in which data are saved / read to / from a file (s).	-	10	-	12	22
5. The interface between the program and database.	2	-	2	-	4
Laboratory work and its defence No. 5. To develop a program code in which data saving, correction, search interface between the program and database is realised.	-	13	-	16	29
6. Class inheritance, encapsulation, polymorphism.	2	-	2	-	4
Laboratory work and its defence No. 6. To develop a program code in which class inheritance, encapsulation and polymorphism principles are realised.	-	12	-	12	24
7. Abstract classes, abstract methods, <i>interface</i> classes.	2	-	2	-	4
Individual work. To develop a program, in which at least one abstract, <i>interface</i> class, <i>private</i> , <i>public</i> , <i>protected</i> , <i>static</i> modifiers, encapsulation and polymorphism principles are realised.	-	-	-	14	14
Preparation and taking the examination				12	12
Total number of hours	14	63	14	98	189

Assessment of learning outcomes

Ten-point criteria-based assessment system as well as cumulative assessment using individual cumulative index (ICI) are applied. The overall grade is the sum of grades for intermediate accountings and examination (E) multiplied by weighted coefficients.
 ICI = 0,4 DLw + 0,2 IND + 0,4 E, where DLw – defence of laboratory works, IND – defence of individual work

Recommended literature

Key literature						
No.	Year of publishing	Author(s) and title of the publication	Publishing house	Number of copies and/or internet link		
				ŠSC library	Other premises	Other libraries *
1.	2011	Matulis D. Duomenų struktūrų objektinio programavimo praktikumas. Mokomoji knyga	Technologija	4	-	10
2.	2008	Sinkevičius S. PHP 5 pradmenys	Smaltija	4	-	13
3.	2008	Blonskis J., Bukšinėitis V. ir kt. Programavimas C++	Technologija	4	-	
4.	2008	Vidžiūnas A. C++ ir objektinis programavimas: programuotojo vadovas	Smaltija	4	-	11
5.	2007	Julie Mezony, PHP, MySQL ir Apache	Smaltija	1	-	15
Additional literature						
No.	Year of publishing	Author(s) and title of the publication	Publishing house and/or internet link			
1.	2015	Lockhart J. Modern PHP: New Features and Good Practices	O'Reilly Media			
2.	2015	Milašauskas S. Objektinio programavimo dalyko kompendiumas				
3.	2013	Ullman L. PHP Advanced and Object – Oriented Programming	Pearson Education			

* ŠAVB – Šiauliai Region Povilas Višinskis Public Library, ŠU – library of Šiauliai University

Required material resources and their short description

<ul style="list-style-type: none"> • Equipment (devices): computers (16 units), computers connected to the local network and connected to the Internet, multimedia projector, printer. • Software: Windows 10 or later, PHP editor and script interpreter <i>NuSphere PhpED</i> , MS Visual C++ 2010 or later.
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The description prepared by:

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