COURSE UNIT DESCRIPTION

Course unit title	Course unit code
"Mainframe" technologies	**ITMT**

Lecturer	Department where the course unit is delivered
Coordinator: lector Germanas Šamrickis	Department of Computer Science II Faculty of Mathematics and Informatics Vilnius University

Cycle	Type of the course unit
First	Optional

Mode of delivery	Semester or period when the course unit is delivered	Language of instruction
Face-to-face	5th semester	Lithuanian and English

Prerequisites

Number of ECTS credits allocated	Student's workload	Contact hours	Individual work
5	126	64	62

Purpose of the course unit: programme competences to be developed

Generic competences to be developed

- Ability to apply knowledge in practice *(BK1)*
- Ability to solve prolems *(BK4)*
- Ability to use information and communications technologies *(BK5)*

Subject-specific competences to be developed

- Ability to apply general methods of the program design, make and analyse software requirements *(DK1)*
- Ability to evaluate the need of the organization for hardware based on working principles of different computer architectures and various devices *(DK7)*
- Ability to ensure information security using management and security mechanisms of operating systems and software *(DK8)*

Learning outcomes of the course unit	Teaching and learning methods	Assessment methods
Ability to explain the basic concepts of the mainframe, including its usage, and architecture. Ability to distinguish the basic functional characteristics of the operating system z/OS, and the hardware that runs the z/OS.	Inclusive lectures, discussions, reading of literature	Exam test
Abilty to generalize the types of workloads that are commonly associates with the mainframe, and the major middleware products, including IMS, DB2, CICS, and WebSphere.	Case study, reading of literature	Exam test, submission and defence of tasks
Ability to apply the tools and utilities for	Demonstrations, reading of	Exam test, submission and

developing a simple program to run on z/OS; ability to design and implement the application choosing a programming language and using a runtime environment.	literature	defence of tasks
Ability to use the system through direct interaction, such as commands and menu style user interfaces (TSO, ISPF, z/OS UNIX, Zowe, z/OSMF).	Case study, practical exercises	Submission and defence of tasks
Ability to use JCL, code in REXX and Python, or Java on the mainframe, and effectively work with mainframe middleware and provided APIs and system utilities	Inclusive lectures, reading of literature, practical exercises	Submission and defence of tasks. Exam open questions

Course content: breakdown of the topics	**Individual work: time and assignments**							
	Lectures	Tutorials	Seminars	Laboratory work	Internship/ work placement	**Contact hours**	**Individual work**	**Assignments**
1. Introduction to the modern mainframe and hybrid cloud environments	2					**2**	**2**	Reading literature
2. TSO/E, ISPF, and UNIX Shell: Interactive facilities and command-line interfaces on z/OS	2			4		**6**	**5**	Reading literature, practical exercises, analysis of examples
3. Working with data sets and modern data storage solutions	2			4		**6**	**4**	
4. Introduction to JCL and automation tools	4			8		**12**	**11**	
5. Batch processing, JES2/JES3, and workflow orchestration	2			2		**4**	**4**	
6. Modern utility programs and tooling on z/OS				8		**8**	**7**	
7. Mainframe hardware systems and high availability	3					**3**	**3**	Reading literature
8. z/OS overview and architecture in a hybrid cloud world	7					**7**	**7**	
9. Mainframe operations and observability with modern monitoring tools	2					**2**	**2**	
10. Modern application development on z/OS with open-source tools	2			4		**6**	**7**	Reading literature, practical exercises, analysis of examples.
11.Transaction and databases management systems on z/OS	2			2		**4**	**2**	Reading literature, practical exercises.
12. Messaging, event processing, and API enablement	1					**1**	**1**	Reading literature
13. Types of Application Servers on z/OS	1					**1**	**1**	
14. Security on z/OS	2					**2**	**2**	
Preparation for the exam							**4**	
Total	**32**			**32**		**64**	**62**	

Assessment strategy	Weig	Deadline	Assessment criteria

	ht %		
Classwork	40	During the semester based on the defined schedule	Ability to use the system through direct interaction, correct solution of the practical exercises, ability to answer questions, related tu understanding of application steps.
Exam	60		Test and practical exercises. Correct answers.

Author	Publishing year	Title	Issue No or volume	Publishing house or Internet site
Required reading				
Mike Ebbers, John Kettner, Wayne O'Brien, Bill Ogden	2011	Introduction to the New Mainframe: z/OS Basics		http://www.redbooks.ibm.com (IBM Form Number SG24-6366-02)
Mike Ebbers, Frank Byrne, Pilar Gonzalez Adrados, Rodney Martin, Jon Veilleux	2006	An Introduction to the Mainframe - Large Scale Commercial Computing		http://www.redbooks.ibm.com
Optional reading				
IBM	2014	TSO/E REXX User's Guide		SA32-0982-00
IBM	2019	MVS JCL Reference		SA23-1385-30
IBM	2019	MVS JCL User's Guide		SA23-1386-30
IBM	2019	z/OS ISPF Dialog Developer's Guide and Reference		SC19-3619-30
IBM	2010	Application Programming on z/OS		5694-A01
IBM	2019	z/OS UNIX System Services User's Guide		SA23-2279-30
IBM	2019	z/OS Security Server RACF Auditor's Guide		SA23-2290-30