ÓBUDA UNIVERSITY
JOHN VON NEUMANN FACULTY OF INFORMATICS

Institute of Cyber-physical Systems						
Name of the subject:	Code of the subject:	Credits:	Weekly hours:			
				lec	sem	lab
Cloud computing services I	NIXFS1CBNE	3	full-time	2		
Responsible person for the subject: Róbert Lovas Ph.D. habil.			Classification: associate professor			
Subject lecturer(s): Attila Farkas						
Prerequisites:	NIXVT1CBNE	Virtualised storage systems				
Way of the assessment:	Mid-term mark					

Course description	
Goal:	The main aim of the subject is to get familiarised with cloud computing systems, and to provide theoretical grounding for widespread public, private, and hybrid cloud platforms both from the user's and from the cloud operator's point of view. Introduce to and get practiced in the development of cloud-oriented software systems using the most widespread design patterns. The course serves as the basis for the practical knowledge to be used for the deployment of an open-source cloud computing system during the practice labs later.
Course description:	The students will acquire knowledge on service types offered by clouds (IaaS/PaaS/SaaS), and their related deployment characteristics, typical solutions, as well as their management and automation possibilities. In the course students learn about the practical approaches of developing cloud-based software systems. The course deals with developer and test environments, special development and programming models and design patterns, standard solutions, and best practices in development. The topics also cover the authentication and security issues of cloud-oriented software systems.

Lecture schedule	
Education week	Topic
1.	Clouds and software models
2.	IaaS: APIs, development and test tools
3.	PaaS / SaaS: APIs, development and test tools
4.	OpenNebula I
5.	OpenNebula II
6.	OpenNebula III
7.	Design patterns I: Scalability
8.	Design patterns II: High Availability
9.	Design patterns III and IV: Static and dynamic data
10.	Design patterns V: Databases
11.	Design patterns VI: Data processing
12.	Design patterns VII: Throw-away environments
13.	Midterm test
14.	Midterm test retake (if necessary)

Mid-term requirements	
Conditions for obtaining a mid-term grade/signature	The written test has to be passed.

Assessment schedule	
Education week	Topic
13th	Midterm test
14th	Midterm test retake

Method used to calculate the *mid-term grade* (to be filled out only for subjects with mid-term grades)

Achieved result	Grade
89%-100%	excellent (5)
76%-88<%	good (4)
63%-75<%	average (3)
51%-62<%	satisfactory (2)
0%-50<%	failed (1)

Type of the replacement	
Type of the replacement of written test/mid-term grade/signature	**Signature retake exam**

Type of the exam (to be filled out only for subjects with exams)

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Calculation of the exam mark (to be filled only for subjects with exams)

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Final grade calculation methods:

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References	
Obligatory:	**The published student material in the Moodle page of the subject**
Recommended:	Barrie Sosinsky: Cloud Computing Bible, Wiley, 2011 Bill Wilder: Cloud Architecture Patterns, O'Reilly, 2012 Marcus Young: Implementing Cloud Design Patterns for AWS, PACKT, 2015
Other references:	