

Obuda University John von Neumann Faculty of Informatics			Institute for Cyber-Physical Systems		
Name and code: Cloud computing services II (NIEFS2CBNE)				Credits: 2	
Computer Science and Engineering BSc				2020/21 year II. semester	
Subject lecturers: Attila Farkas					
Prerequisites (with code):					
Weekly hours:	Lecture: 0	Seminar.: 0	Lab. hours: 2	Consultation: 0	
Way of assessment:	mid-term mark				
Course description:					
Goal: The main aim of the subject is to get practical skills on cloud computing systems. Besides the public cloud computing services (e.g. Amazon Web Services), there is a special focus on setting up of platform services (e.g. Microsoft Azure) and their access through various interfaces. The students get familiar with the step-by-step deployment and operation of private Infrastructure-as-a-Service clouds particularly based on open-source solutions (e.g. OpenNebula and OpenStack). For demonstration purposes Big Data and IoT (Internet of Things) applications will be presented during the practices.					
Course description: Build, operate, and deploy OpenNebula private cloud solution. Using the OpenNebula EC2 interface. Build and use of S3 data storage. Cloud orchestration and reference architectures. Create an ASP.NET web application in Microsoft Azure. Deploying and using Docker container technology and Docker Swarm cluster. Creating a distributed NoSQL database on Docker basis.					

Lecture schedule	
<i>Education week</i>	<i>Topic</i>
1.	Introduction
2.	OpenNebula installation
3.	OpenNebula administration
4.	OpenNebula EC2 interface
5.	Docker basics
6.	Break - National holiday
7.	Docker Swarm basics
8.	Distributed NoSQL database
9.	Break - Eastern Monday
10.	Cloud orchestration and reference architectures
11.	MinIO – S3 object storage
12.	Midterm test
13.	Midterm project presentation
14.	Replacement of midterm test or the presentation

Midterm requirements													
The midterm test has to be passed, and the project work has to be documented and presented.													
Midterm tests													
Education week	Topic												
12	Midterm test												
13	Presentation of project work												
14	Replacement of midterm test or project work presentation												
Final grade calculation methods													
<p>Digital education mode: The midterm test will be a Moodle test, after the successful test, there will be an oral part which will modify the test result with -1/0/+1 grade.</p> <p>Traditional education mode: Written midterm test.</p> <p>In both cases, the completed project work will modify the final result with -1/0/+1 grade.</p>													
<table> <tr> <th>Achieved result</th><th>Grade</th></tr> <tr> <td>89%-100%</td><td>excellent (5)</td></tr> <tr> <td>76%-88<%</td><td>good (4)</td></tr> <tr> <td>63%-75<%</td><td>average (3)</td></tr> <tr> <td>51%-62<%</td><td>satisfactory (2)</td></tr> <tr> <td>0%-50<%</td><td>failed (1)</td></tr> </table>		Achieved result	Grade	89%-100%	excellent (5)	76%-88<%	good (4)	63%-75<%	average (3)	51%-62<%	satisfactory (2)	0%-50<%	failed (1)
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Type of replacement													
In the 14 th week for the written midterm test / project presentation.													
Type of exam													
-													
Exam grade calculation method													
-													
References													
Mandatory:													
The published student material in the Moodle page of the subject													
Recommended:													
Barrie Sosinsky, Cloud Computing Bible, Wiley, ISBN: 9780470903568 Adrian Mouat, Using Docker, O'Reilly Media, ISBN: 9781491915912 Eben Hewitt, Jeff Carpenter, Cassandra: The Definitive Guide, O'Reilly Media, ISBN: 9781491933664													