Obuda University			Institute of Biomatics			
John von Neumann Faculty of Informatics				7		G 114 4
Name and code: <i>Database- and Big Data technologies</i> (<i>NIXAB1EMNE</i>) Credits: 4						
Computer Engineering MSc (English language) 2020/21 year 2. semester						
Subject lecturer: Rita Fleiner, Péter Piros						
Prerequisites (with code):	h					
Weekly hours:	Lectur	e: 2	Seminar.: 0		Lab. hours: 2	Consultation: 0
Way of	Drainst work & toots					
assessment:	rioject work & tests					
Course description:						
Goal: The aim of the lesson is to familiarize students with advanced database management						
concepts and procedure.						
Course description: Data and relational data models, relational algebra, SQL deep dive.						
Logical and physical data model, relations. RDBMS design, dependencies, constraints, normal						
forms, normalization. Triggers and constrains in SQL. Database fundamentals, instance definition, memory structures in db. Transactions. Index types, hashes. SQL tuning. NoSQL databases: types, concepts, architecture, queries. Introduction to Big data, Hadoop framework,						
Apache Spark.						

Schedule						
Education week	Торіс					
1.	Introduction. Knowledge assessment. Relational database systems.					
	Advanced SQL exercises.					
2.	Database architecture, Database instance. Advanced SQL exercises.					
3.	From SQL basics to advanced SQL. Execution plan, database tuning,					
	access paths, indexes, join types, CBO statistics, selectivity, costs,					
	materialization, pipelining. Execution plan analysis.					
4.	From SQL basics to advanced SQL. Execution plan, database tuning,					
	access paths, indexes, join types, CBO statistics, selectivity, costs,					
	materialization, pipelining. Execution plan analysis.					
5.	Test (theory + practise) Project presentation					
6.	NoSQL databases. Cassandra: concepts, architecture, queries					
7.	NoSQL databases. MongoDB: concepts, architecture, queries					
8.	Basics of Big data. Hadoop framework. Hadoop Hive in practise.					
9.	Holiday					
10.	Basics of Big data. Apache Spark. Spark in practise.					
11.	NoSQL databases: concepts, types. Key-value stores. Redis: concepts,					
	architecture, queries					
12.	Databases in cloud environment					
13.	Test (theory + practise) Project presentation					
14.	Test replacement					

Midterm requirements

The course runs in elearning form.

There will be two moodle tests during the course:

1. test is on the 5th week. Topic: Relational databases, tuning. (50 points)

2. test is on the 13th week. Topic: NoSQL databases and Big data (50 points)

Students can earn extra points by solving project tasks (optional). Prerequisite for obtaining a mid-year grade: completion of at least 51% of both tests.

A student who has missed more than 30% of the classes will not receive a mid-year grade.

Final grade calculation methods

The final grade is formed from the project points and the tests points.

Achieved result	Grade
85%-100%	excellent (5)
74%-84<%	good (4)
63%-73<%	average (3)
51%-62<%	satisfactory (2)
0%-50%	failed (1)

Type of requirement

Project and tests

Type of replacement

In the 14th week for all of the tests.

References

Obligatory: Lecture notes (download form <u>https://elearning.uni-obuda.hu/</u>)

Recommended:

Elmasri, Navathe: Fundamentals of Database Systems

Other materials: -