

Institute of Cyber-physical Systems			2024-25-2 semester			
Name of the subject:	Code of the subject:	Credits:	Weekly hours:			
				lec	sem	lab
Databases	NKXAB1EBNF	4	full-time	2	0	2
Responsible person for the subject:			Classification:			
Subject lecturer(s): Erick Alexander Noboa Castro						
Prerequisites:						
Way of the assessment:		Midterm grade				
Course description						
Goal:	The aim of the lesson is to familiarize students with advanced database management concepts and procedure, and to develop skills for query writing.					
Course description:	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. SOL tuning.					

Lecture schedule	
Education week	Topic
1.	Introduction. Knowledge assessment. Relational database systems. Advanced SQL exercises.
2.	Database architecture, Database instance. Advanced SQL exercises.
3.	Database architecture, Database instance. Advanced SQL exercises.
4.	Database architecture, Database instance. Advanced SQL exercises.
5.	1 st Mid-Term Test
6.	From SQL basics to advanced SQL. Execution plan, database tuning, access paths, indexes, materialization, pipelining. Execution plan analysis.
7.	Database tuning, access paths, indexes.
8.	Database tuning, access paths, indexes.
9.	Database tuning, access paths, indexes.
10.	Holiday (Rector's Break)
11.	Join types, CBO statistics, selectivity, costs.
12.	Execution plan analysis.
13.	2 nd Mid-Term Test.
14.	Retake tests.
Mid-term requirements	
Conditions for obtaining a mid-term grade/signature	<p>There will be two tests during the course:</p> <ol style="list-style-type: none"> 1. The first test is on the 5th week. Topic: Relational databases. Theory and practice (30 points) 2. test is on the 13th week. Topic: Query writing, DB tuning (30 points) <p>Weekly Homework of each lecture (40 points) *</p> <p>Prerequisite for obtaining a mid-year grade: students must pass both tests and all homework with at least 51% each.</p> <p><i>A student who has missed more than 30% of the classes will not receive a mid-year grade.</i></p> <p><i>(*) Student's participation during lectures is considered as part of the Homework.</i></p>
Assessment schedule	
Education week	Topic
5	RDMBS, Database architecture (concepts and queries)
13	Tuning, Advanced SQL (concepts and queries)

Method used to calculate the <i>mid-term grade</i> (to be filled out only for subjects with mid-term grades)													
<table border="1"> <thead> <tr> <th>Achieved result</th> <th>Grade</th> </tr> </thead> <tbody> <tr> <td>85%-100%</td> <td>excellent (5)</td> </tr> <tr> <td>74%-84<%</td> <td>good (4)</td> </tr> <tr> <td>63%-73<%</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> </tbody> </table>		Achieved result	Grade	85%-100%	excellent (5)	74%-84<%	good (4)	63%-73<%	average (3)	51%-62<%	satisfactory (2)	0%-50%	failed (1)
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Type of the replacement													
Type of the replacement of written test/mid-term grade/signature	In the 14 th week for all of the tests.												
Type of the exam (to be filled out only for subjects with exams)													
Calculation of the exam mark (to be filled only for subjects with exams)													
Final grade calculation methods:													
The final grade is formed from the HomeWorks, project points and the tests points.													
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References													
Obligatory:	Lecture notes (download form https://elearning.uni-obuda.hu/)												
Recommended:	Elmasri, Navathe: Fundamentals of Database Systems												
Other references:													