BAKI ALİ NEFT MƏKTƏBİ
BAKU HIGHER OIL SCHOOL

Process Automation Engineering Department

Database Management Systems

Course Syllabus

Fall, 2023

Instructor   : Assoc. Prof. Mahammad Sharifov

Course code: Course credit   : 5

Office   : 412, BHOS Campus   Office hours   : M-F 09.00-16.00

Prerequisites:

Language of instruction: English

Schedule   :

- IT 21.1: Lecture
- IT 21.1: Laboratory

Web site   : http://www.bhos.edu.az/en/staff/214-mahammad-sharifov-associate-professor/20

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Description about course

This is an introductory course in Database Management Systems. The following topics will be discussed during the course: ER diagrams and the relational model | Relational algebra and SQL | | Subqueries, conditional statements | Constraints and triggers | Storage & indexing | Semi Structured-Data model and XML | Distributed databases and replication | Object-oriented and object-relational databases | NoSQL, MongoDB

Course objective section

The main objective of this course is to provide students with the background to design, implement, and use database systems. Upon successful completion of this course, students will have the skills

to analyze business requirements and produce a viable model and implementation of a database to meet such requirements.

Learning outcomes section

The student should develop skills and understanding in:
- The design methodology for databases and verifying their design correctness;
- Implementing databases and applications software primarily in the relational model;
- Using querying languages such SQL, NoSQL and other database supporting software's such MySQL, Oracle, MongoDB;
- Applying the theory behind various database models and query languages;
- Implementing security and integrity policies relating to databases;
- Working in group settings to design and implement larger programming projects.

Assessment methods

The exams are done using computers. Some part of exams is written examination. All questions must be answered.

Grading:

Exam	Weight	Date	Exam minutes
Final	40%	TBA (to be announced)	120
Activity	10%	during semester	
Lab/Quiz	20%	4 lab/quiz per semester	deadline
Project	20%	see tentative schedule	deadline
Tutorial	10%	see tentative schedule	deadline

Reset Exam grading:

40% of total score. Total score after reset = labs (20%) + project (20%) + tutorial (10%) + activity (10%) + reset score (40%)

Area grading scale

A 91-100

B 81-90

C 71-80

D 61-70

F   ≤ 60

Rules

Exams

In order to be excused from the exam, the student must contact the dean and the instructor before the exam. Excuse will not be granted for social activities such as trips, cruises and sporting events (unless you are participating). The exams will all be cumulative. Most of the questions on each exam will be taken from the chapters covered since the last exam.

But some will come from the earlier chapters. In general, the coverage will reflect the amount of the time spend in class on the different chapters.

Withdrawal (pass / fail)

This course strictly follows grading policy of the Process Automation Engineering Department. Thus, a student is normally expected to achieve a total mark (preexam score + exam score) of at least 61 to pass. In this case of failure, he/she will be referred or required to repeat the course the following term or year.

Late policy

Late assignment submissions won't be accepted for grading. The grade for this assignment will be zero.

Teaching resources

Textbooks:

[1] SQL and NoSQL Databases by Andreas Meier and Michael Kaufmann, Springer Vieweg publication, 2019. **(**main textbook, available in PDF version**)**

[2] SQL Queries for Mere Mortals by John L.Viescas, Fourth edition, 2018. **(**main textbook, available in PDF version**)**

[3] PRACTICAL SQL, A Beginners Guide to Storytelling with Data by Anthony de Barros, No starch press, 2018. **(**main textbook, available in PDF version**)**

For class presentations and discussions, the student should utilize journal and internet materials. Moreover, the course does not limit the use of learning materials available at BHOS library.

Attendance

The students are required to attend all classes as a part of their studies and those having legitimate reasons for absence (illness, family bereavement, etc.) are required to inform the instructor.

Professionalism and Participation

1. Attend class regularly, arrive on time, leave only when dismissed

2. Attend class with all materials required, be prepared to listen and work

3. Be well prepared for class, read all required materials, and complete all necessary preparation

4. Be attentive in class, take notes, contribute to discussion and ask intelligent questions

5. Demonstrate professional and respectful interpersonal relationships with peers and instructor: ATTITUDE COUNTS, AND whining is unacceptable

6. Take responsibility for your actions, and your results

Plagiarism

Honesty requires that any ideas or material taken from another source for written, visual, or oral use must be fully acknowledged. Offering the work of someone else as one's own is plagiarism. The language or ideas thus taken from another may range from isolated formulas, images, sentences or paragraphs to entire articles copied from books, periodicals, speeches, or the writings and creations of other students. The offering of materials assembled or collected by others in the form of projects or collections without acknowledgment also is considered plagiarism. Any student who fails to give credit for ideas or materials taken from another course is guilty of plagiarism.

Week	Topics	Textbook/Assignments
1	**Introductory concepts of DBMS** • Introduction to DBMS • DBMS Characteristics • Database Users • Advantages and Disadvantages of DBMS • Database System Architecture. • Entities and their Attributes • Relationships and Relationships Types	To be provided
2	**Entity-Relationship model. The Relational model** • ER Model: Generalization, Specialization and Aggregation • Enhanced ER Model • Structure of relational databases • Domains, Relations	To be provided
3	**Relational Database design** • Basic concepts, Design process • Constraints, Keys, Design issues, E-R diagrams	To be provided
4	**Normalization Rules** • Functional dependency • Anomalies in a Database • Properties of normalized relations	To be provided
5	**Basic SQL Concepts** • Basics of SQL, structure – creation, alteration, defining constraints • Primary key, foreign key, unique, index, not null, check, IN operator • Functions - aggregate functions, Built-in functions – numeric, date, string functions, set operations	To be provided

6	**SQL Concepts** • Sub-queries. Use of group by, having, order by, join and its types • Advanced Sub-queries	To be provided
7	**Stored Procedures and Functions** • Stored Procedure basics • Conditional Statements, Loops • Error Handling • Stored Functions	To be provided
8	**Triggers and Transactions** • Triggers • Transactions	To be provided
9	**NoSQL Concepts** • Introduction to NoSQL • MongoDB as case study • MongoDB and the Document Model • MongoDB CRUD Operations	To be provided
10	**MongoDB** • MongoDB Aggregation • MongoDB Indexing and Performance • MongoDB Data Modeling	To be provided
11	**Users' role management in DBMS** • MySQL as case study **Dumping in DBMS** • MySQL as case study	To be provided
12	**Final Project Presentation** • Final Project due!	
	Final Exam	

Signature:

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