

**JSC «Kazakh-British Technical University»
Faculty of Information Technology
Chair of Information Systems Management**

APPROVED BY
Dean of FIT
Imanbayev. A. Z. _____
«____»_____ 2023.

SYLLABUS

Discipline: CSE1301 Databases

Number of credits: 3 (2/0/1)

Term: Fall 2023

Instructor's full name: Aibek T. Kuralbayev

Personal Information about the Instructor	Time and place of classes		Contact information	
	Lessons	Office Hours	Tel.:	e-mail
Kuralbayev Aibek Talgatuly Senior Lector	According to the schedule	According to the schedule	870122258 27	aibekkuralbayev@gmail.com

Course duration: 3 credits, 15 weeks (60 class hours)

Course pre-requisites: Programming languages

Course Objectives:

This course aims to basic principles of databases, design and development databases as part of an entire information system, proficiency in basic database development. This course includes SQL databases foundation, also Database Management Systems are covered. As a chosen DMBS – PostgreSQL Server will be highlighted. As additional part of this course, integration of databases with backend web-application will be implemented.

Course Goals:

After the completion of the course, students will learn how to do the following:

- Develop SQL databases as part of an entire information system.
- Design normalized database structures
- Create and manage databases.
- Create stored procedures and triggers.
- Create SQL transactions

Literature:**Required:**

1. DATABASE SYSTEM CONCEPTS, SEVENTH EDITION, Silberschatz Abraham, Korth, Henry F., Sudarshan, S., 1344 pages, 2020

Supplementary:

1. <https://www.postgresql.org/docs/current/tutorial.html>

COURSE CALENDAR

W ee k	Class work					SIS (students independent study)		TSIS (teacher supervised independent study)	
	Topic	L ec tu re s, h o u rs	L a b, h o u rs	S e m i n a r s , h o u rs	C h a p t e r s f o r r e a d i n g	H o u r s	D e s c r i p t i o n	H o u r s	D e s c r i p t i o n
1	Week #1. Introduction to Databases • Database-System Applications • Purpose of Database Systems • View of Data • Database Languages • Database Design • Database Engine • Toolkit	2	0	1		1			
2	Week #2. Introduction to Relational Model • Structure of Relational Databases • Database Schema • Keys • Schema Diagrams • Relational Query Languages • The Relational Algebra	2	0	1		1			

3	Week #3. Structured Query Language (SQL) - Part 1 <ul style="list-style-type: none"> • Overview of the SQL • SQL Data definition • Basic structure of SQL Queries 	2	0	1		1	Lab #1		
4	Week #4. Structured Query Language (SQL) - Part 2 <p>Data Definition Language foundation, overview of DDL basic principles.</p>	2	0	1		1	Lab #2		
5	Week #5. Structured Query Language (SQL) - Part 3 <ul style="list-style-type: none"> • Data manipulation Language foundation, basic SQL operators overview, principles of data manipulation. 	2	0	1		1	Lab #3		
6	Week #6. Structured Query Language (SQL) - Part 4 <ul style="list-style-type: none"> • Data table selection, data filtering, ordering of output data. 	2	0	1		1	Lab #4		
7	Week #7. Structured Query Language (SQL) - Part 5 <ul style="list-style-type: none"> • Additional Basic Operations • Set operations • Null values • Aggregate functions • Nested subqueries 	2	0	1		1	Lab #5		
8	Week #8. Midterm exam	2	0	1		1			

9	Week #9. Intermediate SQL <ul style="list-style-type: none"> • Join Expressions • Views • Transactions • Integrity Constraints • SQL Data Types and Schemas • Index Definition in SQL • Authorization 	2	0	1		1	Lab #6		
10	Week #10. Intermediate SQL (cont.) <ul style="list-style-type: none"> • Join Expressions • Views • Transactions • Integrity Constraints • SQL Data Types and Schemas • Index Definition in SQL • Authorization 	2	0	1		1	Lab #7		
11	Week #11. Advanced SQL <ul style="list-style-type: none"> • Functions and Procedures • Triggers • Recursive Queries • Advanced Aggregation Features • Query optimization and performance tuning 	2	0	1		1	Lab #8		

12	Week #12. Advanced SQL (cont.) <ul style="list-style-type: none"> • Functions and Procedures • Triggers • Recursive Queries • Advanced Aggregation Features • Query optimization and performance tuning 	2	0	1		1	Lab #9		
13	Week #13. Complex Data Types <ul style="list-style-type: none"> • Schema-less data modeling • JSON and BSON data formats 	2	0	1		1	Lab #10		
14	Week #14. Advanced Concepts <ul style="list-style-type: none"> • Full text search in PostgreSQL 	2	0	1					
15	Lecture #15. Endterm exam	2	2	1					
	Final Exam					In written form			
	Total	30	0	15		15		45	

COURSE ASSESSMENT PARAMETERS

Type of activity	Final scores
Laboratory works	20%
Midterm	20%
Endterm	20%
Final exam	40%
Total	100%

Criteria for evaluation of students during semester:

		Weeks	Total
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	Assessment criteria	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16-17	Total scores
1.	Laboratory works			*	*	*	*	*			*	*	*	*	*			20%
3.	Midterm and endterm							*								*		40%
5.	Final exam																*	40%
	Total																	100%

Academic Policy

KBTU standard academic policy is used.

- Cheating, duplication, falsification of data, plagiarism, and crib are not permitted under any circumstances!
- Attendance is mandatory.

Attention. Missing 30% attendance to lessons, student will be taken from discipline with filling in F (Fail) grade.

Students must participate fully in every class. While attendance is crucial, merely being in class does not constitute “participation”. Participation means reading the assigned materials, coming to class prepared to ask questions and engage in discussion.

- Students are expected to take an active role in learning.
- Written assignments (independent work) must be typewritten or written legibly and be handed in time specified. Late papers are not accepted!
- Students must arrive to class on time.
- Students are to take responsibility for making up any work missed.
- Make up tests in case of absence will not normally be allowed.
- Mobile phones must always be switched off in class.
- Students should always be appropriately dressed (in a formal/semi-formal style).
- Students should always show tolerance, consideration and mutual support towards other students.