

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



SYLLABUS

Discipline: CSE1301 Databases

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

Term: Fall 2024

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 (45 class hours)

Course pre-requisites:

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

Week	Class work					SIS (students independent study)		TSIS (teacher supervised independent study)	
	Topic	Lectures, hours	Labs, hours	Seminars, hours	Chapters for reading	Hours	Description	Hours	Description
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. Structured Query Language (SQL) - Part 1	2	0	1		1			

	Data Definition Language foundation, overview of DDL basic principles.								
3	Week #3. Structured Query Language (SQL) - Part 2 <ul style="list-style-type: none"> Data manipulation Language foundation, basic SQL operators overview, principles of data manipulation. 	2	0	1		1	Lab #1		
4	Week #4. Structured Query Language (SQL) - Part 3 <ul style="list-style-type: none"> Data table selection, data filtering, ordering of output data. 	2	0	1		1	Lab #2		
5	Week #5. Structured Query Language (SQL) - Part 4 <ul style="list-style-type: none"> Function and operators. 	2	0	1		1	Lab #3		
6	Week #6. Structured Query Language (SQL) - Part 5 <ul style="list-style-type: none"> Constraints 	2	0	1		1	Lab #4		
7	Week #7. Structured Query Language (SQL) - Part 6 <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. 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 #8		
12	Week #12. 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 #9		
13	Week #13. 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 #10		

