Data Bases

- To provide a solid understanding of relational database management systems (RDBMS) from initial stages of analysis to ultimate activities involving design and implementation.
- Theory & Practice

Private study	In class	Final exam	Planned Total	Extra	Workload Total	ECTS
58	50	1,5	109,5	15,5	125	5

Datacamp 26 hrs
Project 25 hrs
Final 7 hrs
Private study 58 hrs

Curriculum (higher programme, short version)

Data Bases
Module No.: BST-BCS-23

School	Berlin School for Technology
Degree programme	Computer Science (Fast Track)
Number of module	BST-BCS-23
Name of module	Data Bases
Duration	Block module (5 Weeks)
Module type	Obligatory
Module frequency	Every Semester
Requirements for enrolmen	
Applicability	
Language of instruction	English
ECTS Points	5
Grading	Graded
Student workload	Workload total: 125 Std. In class: 60 Std. Private study: 65 Std.
Teaching and learning methods	- Interactive Seminar
Type of exam	- Portfolio
Module contents	- Architecture of database systems, conceptual data modeling with the Entity - Relationship (ER) modeling language - Relational data model, referential integrity, keys, foreign keys, functional dependencies (FDs), canonical mapping of entity types and relationship into the relational data model, anomalies - Relational algebra as a simple query language - Dependency theory, FD closure, canonical cover of FD set, decomposition of relational schemata, multivalued dependencies, normalization, inclusion dependencies - Practical query languages and integrity constraints w/o considering a conceptual domain model: SQL - Storage structures, database implementation architecture - Query processing - Query processing - Query optimization - Transactions and recovery - Query languages with recursion and consideration of a simple conceptual domain model: Datalog - Semi-naive evaluation strategy, magic sets transformation - Information integration, declarative schema transformation (LAV, GAV), - Distributed database systems - Complexity measure: Data complexity - Semistructured databases and query languages: XML and XQuery
Syllabus	

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Project (35%)

Please form your teams by June 7, 2023, at 11:59 pm (CET)

4 teams * 4 students = 16 students

Final Exam (35%)

Oral/written exam on Saturday, July 1, 2023, at 9:30 am (CET)

BST-BCS-23A – Databases
Project Overview

Part I. Project Objective
The objective of the project is to provide students with hands-on experience in discovering and understanding real-world data structures. The project aims to design a relational database for a career office to manage information requirements and support managerial decision-making effectively.

Part II. Project Subject: "Career Office Management System"
The "Career Office Management System" facilitates seamless collaboration among career consultants, students, alumni, and companies. The system enables students to easily access and engage with career events such as seminars, training sessions, job/internship postings, and career coaching services. Additionally, university decision-makers can obtain valuable insights into the career office's contributions, students' participation, and the effectiveness of various activities.
In this system, students register using their student numbers and personal information. They can request career coaching meetings with consultants or apply for job/internship opportunities. The career office can accept or reject these meeting requests, and approved meetings will be recorded in the system. Career office consultants are responsible for adding information about planned and organized activities, including time, location, number of participants, and organizers. Alumni can register in the system, attend activities, and even organize events with the career office's approval. Companies can also register to collaborate with the career office and share job and internship opportunities with students through the platform.

Part III. Project Scope

The project encompasses the following key aspects:
1.1 Requirement Collection & Analysis: Teams will thoroughly study the project subject and identify the information requirements of the system. This includes determining what queries and reports should be generated to aid managers or decision-makers in using the platform. Teams will also gather and specify the necessary data requirements through various data-gathering techniques. This phase will expand and refine the use case scenario mentioned above.
1.2 Conceptual Design: Based on the requirements collected and analyzed in the previous step, teams will design a high-level conceptual data model for the system using Enhanced Entity-Relationship (EER) models. This model will incorporate at least eight entities and an appropriate number of relationships.
1.3 Logical Design: Using the ER/EER model developed in the previous step, teams will map the conceptual design into a relational database design. The relational schema will be created based on this logical design.
1.4 Physical Design/Implementation & Querying: Teams will implement the proposed design in a Relational Database Management System (RDBMS) and create queries/reports using SQL (Structured Query Language).

Part IV. Team Formation
Students are responsible for forming their teams and enrolling (shra.shlas.extern@sth.de) to initiate collaboration. *It is crucial to distribute the workload evenly among team members and ensure that every member comprehensively understands the project.*

No. of teams * No. of students	Total # of students	Total # of teams
[4 teams * 4 students]	16	4

PART V. Project Timeline

	Tentative Due Dates
Project Final Report	*June 29*
Project Q&A Sessions	*June 30*

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Assignments / Datacamp (30%)

Please look at these assignments on Datacamp not only as a 30% point but also as an opportunity to seriously support and contribute to the lecture content and your database modelling, design, and optimization skills.

The recommended order of the assignments is as follows;

ASSIGNMENTS	hrs	XP	due
0. IntroductionToSQL	2	1650	12.Jun
1. IntermediateSQL	4	3950	12.Jun
2. JoiningDataInSQL	4	3950	12.Jun
3. DataManipulationInSQL	4	4700	19.Jun
4. ImprovingQueryPerformanceInPostgreSQL	4	4300	19.Jun
5. Transactions&ErrorHandlingInPostgreSQL	4	3950	1.Jul
6. DatabaseDesign	4	4150	1.Jul
TOTAL	**26**	**26650**	**1.Jul**

NOTE: Please refrain from completing any additional courses on Datacamp until the classes end. This request is because I will collect screenshots displaying each student's total XP at the class's conclusion. Therefore, to ensure accurate reporting, it is essential to maintain the current state of your progress until the designated time. I appreciate your cooperation in this matter.

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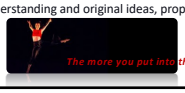
Ground Rules

It is crucial to adhere to the following ground rules to ensure a successful learning experience:

1.Following the lectures on time is essential: Attending and engaging with the lectures as scheduled is important. This will allow you to fully grasp the course material and actively participate in discussions or activities.

2.Following the due dates (and times) is required: All assignments, projects, or assessments have designated due dates and times. Submitting your work within the specified timeframe is mandatory to ensure fairness and maintain a structured learning environment.

3.Authenticity and originality of work: It is expected that all work submitted is authentic and created in your own words. Plagiarism or any form of academic dishonesty is strictly prohibited. Ensure that your work reflects your understanding and original ideas, properly citing any external sources used.



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