BSAN/IST 326

Database Management Systems

Spring 2023

Time: Tuesday and Thursday, 9:30-10:45am
Location: 4035 CAPF

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COURSE PREREQUISITES

Corequisites: IST 202 or BSAN 310 and IST 310

COURSE DESCRIPTION

Increasingly, organizations store and rely on a wealth of data and information that is maintained on the organization's various stakeholders, including customers, employees, suppliers, etc. The ability of an organization to sense, harness, retrieve, and provide data is greatly enhanced by ever-increasing storage capacities and computing power. Simultaneously, firms face ever-increasing information overload constraints that threaten to inhibit firm functionality. The ability to effectively manage data is therefore critical to firm success. Furthermore, data synthesis and analysis promises to support business strategy and provide a competitive advantage.

This course covers the basic concepts of data management, database systems, and database applications in business. The goal is to provide adequate technical detail while emphasizing the organizational and implementation issues relevant to the management of data in an organizational environment. Topics include relational data modeling, logical database design, structured query language, and the use of data in organizations.

This is a 3-credit-hour semester-long course, with two 75-minute in-person class sessions on Tuesdays and Thursdays at 9:30-10:45 am in CAPF 4035. For every credit hour students can expect to spend at least two hours per week in additional study and preparation.

LEARNING OUTCOMES

Students will learn about the design, implementation, use, and management of database management systems. The course material is divided into two related components. The first component will focus on data models and logical database design and will equip students to:

  (1) Explain the advantages and disadvantages of the database approach to data management

(2) Describe the components of a database system

(3) Draw an entity-relationship model

(4) Apply the principles of normalization to translate an ER model

(5) Prepare a database schema to represent data in a table

The second component of the course will discuss physical database design and data retrieval using a standard database language (SQL). Following this component students will be able to create, retrieve, update, and delete data from relational databases using SQL.

TEXTS & MATERIALS

The primary reference materials for this course are the slides and articles linked/uploaded on Canvas. *There is no textbook required for this course.* Students may, however, wish to supplement the in-class and online provided material with the following textbook

Reference Textbook:

Hoffer, Jeffrey A., Ramesh, Venkataraman, and Topi, Heikki, <u>Modern Database Management</u>. 12th Edition, Prentice-Hall, 2016) (ISBN-13: 978-126-948-947-8)

COURSE REQUIREMENTS AND GRADED ACTIVITIES

Your performance in this course will be evaluated in four areas: class participation, two exams, four individual homework assignments, and a group project. Class deliverables and the scale for overall grade are given below:

Deliverable	Percentage of grade		Overall score	Grade
Quizzes	10		>= 90	A ±
Homework	5x5		80 – 89.9	B ±
Midterm 1	15		70 – 79.9	C ±
Midterm 2	15		60 – 69.9	D ±
Project Milestones	10		< 60	F
Project Presentation	10			
Project Report	15			

<u>Note:</u> Final course grades will be scaled to the above grading categories (e.g., if there are 100 quiz points possible these points will be scaled to reflect a "worth" of 10% of the overall grade).

Class Participation

Class attendance and participation counts for 10% of your final grade. Your attendance will be assessed primarily through randomly appearing in-class quizzes. These quizzes

will be "fairly easy", involving only a single question or two, if any questions at all (i.e., "just write your name and submit").

Exams

Exam 1 will cover the material discussed during the first part of the course (see th e breakdown of course below) and will consist of multiple question formats (i.e., multiple choice, short answer, etc.). Exam 2 will consist of traditional questions (multiple choice, etc.) and SQL-based questions, evaluating your ability to write SQL.

Concept	Assignment	Exam
• Database Systems • Database Development Process	-	Exam 1
• Entity-Relationship Model • Enhanced ER Model	Assignment I	
• Logical Design: Converting ER to Relational Tables		
• Normalization	Assignment II	

• Introduction to SQL
    ○ Data Control Language
    ○ Data Definition Language
    ○ Data Manipulation Language
    ○ Simple Queries
	Assignment III	Exam II

• SQL Programming:
    ○ Aggregate Queries
    ○ Join Queries
	Assignment IV	

• Advanced SQL programming: ○ Subqueries and inline queries	Assignment V	
• Advanced Topics		

Homework Assignments

There will be five homework assignments due throughout the semester. The assignments are designed to reinforcement key concepts and material presented during lectures and labs and will therefore consist of a variety of both free-thought and task-based questions. The assignments will also aid students in preparing for the two midterms exams, as well as the final project.

Group Project

It is highly likely that you will work as a team member in your future vocation and it is therefore beneficial to learn effective teamwork practices. Also, in your future organization, you will be required to work with peers with complimentary skills for each project, whom you may or may not know beforehand. The group project will provide you

with an opportunity to apply everything you learn to develop a deliverable by the end of the semester with a formative learning experience.

You will be assigned to a group by the instructor at the outset of the semester. As a group you will choose a "client" (e.g., Netflix, Amazon, etc.) for whom you will develop a database system. The client should have data recorded from multiple sources (e.g., customers, employees, etc.) and a need for this data to be updated on a daily basis (e.g., customer purchases). Upon choosing a client, you will then describe the business use-case, which will entail providing a description of the business and how it will use the database you design in the business' day-to-day operations. You will then design the database and implement it over the course of the semester. As part of the project, you are **not** expected to collect real-world data, but will instead create fictitious data (e.g., make up customer information, sales records, etc.) and therefore you need not have access to any propriety technology or data. There are two project update documents you need to submit, as specified in the schedule. These are brief summary documents that will nominally count towards the project grade and will serve to keep you on track with the project work.

The culmination of the project will be a functional database. You will make a 15-minute group presentation and submit an executive report at the end of the semester as project deliverables to be graded. The final project report should have all the following elements: introduction, problem statement, requirement summary, conceptual model, relational database, normalization, data dictionary, sample data screenshots, implementation details, SQL queries, assumptions, and conclusions. The explicit requirements and grading criteria for the report will be specified in detailed document uploaded on Canvas.

The group writing assignments will help you improve your writing effectiveness in preparing professional reports. Each member of the group is expected to write a section of the report, based on the work that he/she has done. Prepare written submissions using a word processor, single-spaced, and styled appropriately for business correspondence. For technical assistance with writing, you can take advantage of resources provided by the KU writing center http://writing.ku.edu/.

At the end of the course, each of you will get a performance and productivity peer evaluation form which you will submit to the instructor. In this form, you can summarize your contribution as well as the contribution of other members in your group. Peer evaluations **will** be considered when final project grades are determined.

Additional details on the group project will be provided.

COURSE POLICIES

Communication. Students can expect to receive weekly communications from the instructor (via the "Announcements" section on Canvas) and are responsible for the information communicated therein. Students are also responsible for any official correspondence sent to/through their University of Kansas email address. Students are expected to use their University-provided email address to communicate with the instructor and can ***expect a response within 24-48 hours***. If a response is not received within 48 hours, Students are encouraged to send a follow-up email (things can, at times, fall through the cracks). Privacy considerations, such as federal law, may apply when using a non-University address for communication.

Timeliness. **Late work will be penalized**. If you have obligations that conflict with exam/assignment/report due dates, you should contact the instructor as soon as possible and ahead of the due date. Only in extremely rare circumstances will make-up exams be permitted after-the-fact. Equipment failure or conflicting time availability of team members is not an acceptable reason for turning in an assignment late. Late submissions will be penalized 25% of the assignment total each 24-hour period (i.e., after 72 hours, a late assignment will be assigned a 0).

Score/Grade appeals. If you feel that an assigned grade inaccurately reflects your performance, feel free to discuss the matter with the instructor. Timeliness is the responsibility of the student, however. As such, grades that have been assigned for more than one month are not open for appeal.

Software support. The instructor will provide software support for the software that is explicitly being used for course work. Students will be responsible for troubleshooting virtually all potential software issues encountered when using non-course-based software, including operating system issues.

ACADEMIC CODE OF HONOR

The KU School of Business seeks to develop future leaders with the highest ethical standards. It is through a strong code of conduct that we maintain mutual trust and respect among students, faculty, and staff. This code of conduct was developed by the students, faculty, and staff to articulate the School's core values and provide guidance on academic integrity. This code applies to the conduct of students, faculty, and staff at any function or academic activity conducted by the School of Business at the University of Kansas. See https://business.ku.edu/services/student-academic-services/honor-code.

Academic misconduct in this class will not be tolerated. Academic misconduct is not only an unethical behavior; it also deprives you of educational opportunities. There are many forms of cheating, including but not limited to:

- Possession of course material from previous sessions of this course.
- Plagiarism. All written work will be monitored by plagiarism detection software subscribed to by KU.
- Giving, receiving or unauthorized uses of aids during tests or giving test questions to another student who has not yet taken a given test.
- Following KU policy, posting content found on Blackboard/Canvas or any other class materials to a public website is a violation of intellectual property rights.
- Disrupting class is a violation of the honor code and is classified as behavioral misconduct.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

KU's Academic Achievement & Access Center (http://www.achievement.ku.edu/; 22 Strong Hall; 785-864-4064) coordinates services and accommodations for KU students with disabilities. Any students with disabilities for which they may request accommodation in KU classes should contact AAAC as soon as possible. Students should also contact the instructor privately regarding any requested accommodations.

POSITIVE CODE OF CONDUCT (R-E-S-P-E-C-T)

The School of Business promotes a Positive Code of Conduct based on seven principles:

Responsibility: We will accept and be accountable for the outcomes of our actions, work to exceed expectations, meet established deadlines for assignments, and represent the School of Business in a positive manner.

Enthusiasm: We will exhibit leadership, drive and passion in all of our pursuits both inside and outside of classroom by actively engaging room discussions, events, and student organizations.

Self-Development: We will challenge ourselves to seek out opportunities for self-development, for cultivating belief in ourselves will enable us to foster respect for others.

Professional Integrity: We will be honest, trustworthy and genuine in all interactions.

Equity: We will contribute to the learning community at least as much as we receive, support equal opportunity for all students to learn, and act with respect toward the community and the environment.

Compassion: We will practice care, empathy, and understanding toward others by providing them with support or feedback when it is needed.

Teamwork: We will create an open atmosphere where everyone can contribute ideas and engage in respectful discussion without undue criticism, recognizing the value of a team in working toward a common goal.

COMMERCIAL NOTETAKING

Pursuant to the University of Kansas' Policy on Commercial Note-Taking Ventures, commercial notetaking is not permitted in this class. Lecture notes and course materials may be taken for personal use, for the purpose of mastering the course material, and may not be sold to any person or entity in any form.

Any student engaged in or contributing to the commercial exchange of notes or course materials will be subject to discipline, including academic misconduct charges, in accordance with University policy. Notetaking provided by a student volunteer for a student with a disability, as a reasonable accommodation under the ADA, is not the same as commercial notetaking and is not covered under this policy.

EQUAL OPPORTUNITY

The University of Kansas is proud of its goal to help all individuals realize their potential. To this end, the university is committed to providing an equal opportunity for all qualified individuals to be considered for employment, benefits and conditions of employment, educational programs and activities, regardless of race, religion, color, ethnicity, sex, disability, national origin, ancestry, age, status as a veteran, sexual orientation, marital status, parental status, gender identity, gender expression, or genetic information.

DIVERSITY & INCLUSION

As a premier international research university, the University of Kansas is committed to an open, diverse, and inclusive learning and working environment that nurtures the growth and development of all. KU holds steadfast in the belief that an array of values, interests, experiences, and intellectual and cultural viewpoints enrich learning and our workplace. The promotion of and support for a diverse and inclusive community of mutual respect require the engagement of the entire university.

CONCEALED CARRY LAW

Individuals who choose to carry concealed handguns are solely responsible to do so in a safe and secure manner in strict conformity with state and federal laws and KU weapons policy (refer to **http://concealedcarry.ku.edu/**). Safety measures outlined in the KU weapons policy specify that a concealed handgun:

- Must be under the constant control of the carrier.
- Must be out of view, concealed either on the body of the carrier, or backpack, purse, or bag that remains under the carrier's custody and control.
- Must be in a holster that covers the trigger area and secures any external hammer in an un-cocked position.
- Must have the safety on, and have no round in the chamber.

Instructors are allowed by Kansas Board of Regents policy, to require backpacks, purses and other bags be placed at the front of the classroom during exams and quizzes, and as such those items will not be under the constant control of the individual. Students who choose to carry a concealed handgun in a purse, backpack, or bag must review and plan each day accordingly, and are responsible for making alternate arrangements as necessary. The university does not provide appropriate secured storage for concealed handguns. Individuals who violate the KU weapons policy may be asked to leave campus with the weapon and may face disciplinary action under the appropriate university code of conduct.

FREEDOM OF EXPRESSION

Encouraging students to engage in debate and deliberation on any topic in an effective and responsible manner is an essential part of the educational mission of a university. This course does not focus on sensitive or potentially divisive social issues, but regardless it is not the proper role of a university to insulate individuals from ideas and opinions they might find challenging, unwelcome, disagreeable, or even offensive. All university community members share a responsibility to maintain a climate of mutual respect, but concerns about civility and mutual respect should never be used to justify silencing the discussion of ideas. Therefore, consistent with principles of free expression embraced by Purdue University, the University of Chicago, and other institutions, the instructor supports freedom of expression for students to discuss any course-related topic that presents itself.

SCHEDULE (tentative)

Date	Topic	Assigned	Due
01/17	Syllabus, Intro to Databases		
01/19	Account Setup, Software Intro, Project Intro, Group Formation	Project Update I	
01/24	Intro to DBase Cont'd, ER Modeling	HW1	
01/26	Intro to Dbase and PU #1 Lab		
01/31	ER Modeling Continued		
02/02	ER Modeling Lab		
02/07	Enhanced ER Model		
02/09	Enhanced ER Model Lab	HW II	HW I

Date	Topic		
02/14	Logical Design	Project Update II	Project Update I
02/16	Logic Design Lab		
02/21	Normalization		
02/23	Normalization Lab	HW III	HW II
02/28	Intro to SQL		
03/02	Intro to SQL Lab		
03/07	Midterm #1 Review		
03/09	**Midterm #1**		
03/14	**Spring Break – No Classes**		
03/16	**Spring Break – No Classes**		
03/21	Intro to SQL #2		
03/23	Intro to SQL #2 Lab		
03/28	Simple SQL Queries	HW IV	HW III
03/30	Simple SQL Queries Lab		Project Update II
04/04	Aggregate Queries		
04/06	Aggregate Queries Lab		
04/11	Joins	HW V	HW IV
04/13	Joins Lab		
04/18	Midterm 2 Review		
04/20	**Midterm 2**		
04/25	Subqueries and Inline Queries		
04/27	Subqueries and Inline Queries Lab		
05/02	Project Presentations	Project Presentation (due May 2 11:59pm)	HW V
05/04	Project Presentations		
05/09	Finals Week No Class		
05/11	Finals Week No Class		Project Report