

# INSC 584 – Database Management Systems

## COURSE INFORMATION

INSC 584 – Database Management Systems, Fall 2022

University of Tennessee, Knoxville

**Class Meetings:** Tuesday-Thursday, 5:05-6:20 pm ET on Zoom

**Zoom Link:** <https://tennessee.zoom.us/j/93146397077>

### Faculty Contact Information

- Scott Shumate
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- Office hours available upon request via Zoom

### SIS Office Information

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- SIS Office: 865.974.2148
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### Welcome Statement

Welcome to INSC 584! Humans generate a staggering amount of data every day. From medical records to course enrollments and everything in between, data is being created faster than ever before. How is this data stored? In many cases, the answer is databases. Databases are central to modern technology infrastructure, storing, maintaining the integrity of, and making available the data we use in our everyday lives. This course will demonstrate the principles underlying modern databases and the systems we use to manage them. You will have the opportunity to apply these fundamentals in a project that will emulate a scenario you might encounter in the real world.

## COURSE INFORMATION

### Catalog Description

Defining data needs, data structures, the role of operating systems in data management, file organization, database management systems, logical data models, internal data models, database administration, and evaluation. Design and implementation of applications using database management systems.

### Student Learning Outcomes

- understand information needs in organizations and the database environment
- understand the database development process and technology
- master database terminology for effective communication

- be able to design data models using Entity-Relationship (ER) diagrams (conceptual design)
- be able to translate/map ER diagrams to relational models (logical design)
- be able to implement a prototype database application using a relational database management system (DBMS) software package (physical database)
- be able to use Structured Query Language (SQL) to retrieve data (data access)
- understand issues pertinent to operational databases

### **Programmatic Outcomes/Department Goals**

This course's major project can demonstrate MSIS learning outcomes 6, 7, 8, or/and 9 (see [MSIS Program Outcomes](#))

### **Course Design**

This course is delivered synchronously via Zoom with a course site in Canvas. Course content will incorporate lecture, activities, and discussion. All lecture slides will be posted in Canvas. You will complete a project, either alone or with a group, that is representative of a real-world scenario.

This course utilizes a flipped classroom approach. This method requires students to read the course material before coming to class and discussing it, where the instructor can guide students through the material, engage in hands-on activities, and see demonstrations of how the material plays out in practice. This is especially useful for the topics of this course, as drawing entity-relationship diagrams, testing SQL statements, and analyzing different models for a well-defined design case are all easier to grasp when students are familiar with the underlying principles and can see them demonstrated during class time.

### **Required Texts**

Jeffrey A. Hoffer, V. Ramesh, Heikki Topi. Essential Database Management, ©2014. Pearson, 378 pages. [ISBN 0-13-340568-0; 978-0-13-340568-2]

## **COMMUNICATION**

### **Email**

I am required to communicate with you through your UTK email address. If you prefer to use another address, consult the [OIT Helpdesk](#) to obtain directions for forwarding your UTK mail to your preferred address if you don't wish to check both accounts.

### **Instructor Availability**

Please don't hesitate to email me with updates, questions, or concerns. I will typically respond within 24 hours during the week and 48 hours on the weekend. I will notify you if I will be out of town and if connection issues may delay a response.

## COMPUTING REQUIREMENTS AND RESOURCES

### Requirements

You must have adequate computing skills, including but not limited to use of word processing, Web browsers, e-mail, listservs, Canvas, and Zoom software. You must learn how to submit your assignments using Canvas. The [Office of Information Technology \(OIT\)](#) provides training classes in using varied technologies for students at no charge (advance registration is required).

You must obtain a UT email account and subscribe to the SIS student listserv to ensure you are made aware of course-related information. In addition, you must have the PowerPoint Reader or the regular PowerPoint software installed on your computer in order to download the lecture notes from Canvas.

Microsoft Access, Word, and PowerPoint are required. The Microsoft Office Suite, which includes Access, Word, and PowerPoint, can be downloaded through the [UT Available Software](#) link under Microsoft Office 365 for Windows – UTK Preferred Office Version.

### Technical Support

Please review the SIS Technology Introduction website for help getting started with the tools you'll need in the program: <https://sis.utk.edu/techintro/>

For assistance with technical and computing issues, contact the OIT HelpDesk by phone at (865) 974-9900, using the [Contact Form](#), or at the [Walk-in HelpDesk](#).

### Course Resources

Canvas is where the site for this course can be found: [Online@UT Canvas](#)

Synchronous class sessions will take place in Zoom. If you have questions about using Zoom, please see [Getting Started with Zoom](#) or contact the instructor.

## COURSE ATTENDANCE AND PARTICIPATION POLICIES

### Learner Expectations

- Be prepared for all classes, such as reading before the class
- Be active in participating in discussions during class and in Canvas
- Meet due dates on assignments

### Instructor Expectations

- Be attentive to and supportive of individual student's needs
- Be respectful of all students
- Create and facilitate meaningful learning activities
- Evaluate all fairly and equitably; provide feedback to assignments promptly

## **Attendance and Participation**

Regular attendance is required and necessary. Active engagement and speaking in class are encouraged. Ten points of your final grade will be based on participation. Unexplained absences will affect your grade. With that being said, I will be understanding, within reason, regarding absences for acceptable reasons. Contact me as soon as possible if you cannot attend class. If you will be absent from class, you should:

- Inform me in advance or as soon as possible after class
- Adhere to any due dates for upcoming assignments as defined in Canvas
- Listen to the class recording
- Obtain notes, handouts, etc. from Canvas

Acceptable reasons for absence from class include:

- Illness
- Serious family emergencies
- Special curricular or job requirements
- Military obligation
- Severe weather conditions
- Religious holidays
- Participation in official university activities
- Obligations for court imposed legal obligations (i.e., jury duty, subpoena)
- Others, at the instructor's discretion

## **Inclement Weather**

"The chancellor (or appointed representative) may officially close or suspend selected activities of the university because of extreme weather conditions. When a decision to close is made, information is distributed to the campus community, shared with local media, and posted on the front page at <http://utk.edu>. SIS will cancel classes when UT is closed. Please check the SIS student listserv ([UTKSIS-L@LISTSERV.UTK.EDU](mailto:UTKSIS-L@LISTSERV.UTK.EDU)) for messages about closing.

## **ADDITIONAL POLICIES AND POINTS OF INFORMATION**

### **Disabilities that may Impede Learning**

Any student who feels s/he may need an accommodation based on the impact of a disability should contact [Student Disability Services](#) in 2227 Dunford Hall at 865-974-6087, or by video relay at 865-622-6566 to coordinate reasonable academic accommodations.

### **Civility**

Civility is genuine respect and regard for others: politeness, consideration, tact, good manners, graciousness, cordiality, affability, amiability and courteousness. Civility enhances academic freedom and integrity, and is a prerequisite to the free exchange of ideas and knowledge in the learning community. Our community consists of students, faculty, staff, alumni, and campus visitors. Community members affect each other's well-being and have a shared interest in creating and sustaining an environment where all community members and their points of view are valued and respected. Affirming the value of each member of

the university community, the campus asks that all its members adhere to the principles of civility and community adopted by the campus: <http://civility.utk.edu/>.

### **CCI Diversity Statement**

The College of Communication and Information recognizes that a college diverse in its people, curricula, scholarship, research, and creative activities expands opportunities for intellectual inquiry and engagement, helps students develop critical thinking skills, and prepares students for social and civic responsibilities. All members of the College benefit from diversity and the quality of learning, research, scholarship and creative activities is enhanced by a climate of inclusion, understanding and appreciation of differences and the full range of human experience. As a result, the College is committed to diversity and equal opportunity and it recognizes that it must represent the diversity inherent in American society. The College is acutely aware that diversity and fairness are foundations that unite the College's faculty, staff, students, and the larger communication and information community.

### **Instructor Status as a Title IX Mandatory Reporter**

University of Tennessee faculty are committed to supporting our students and upholding gender equity laws as outlined by Title IX. Please be aware that if you choose to confide in a faculty member regarding an issue of sexual misconduct, dating violence, or stalking, we are obligated to inform the University's Title IX Coordinator, who can assist you in connecting with all possible resources both on- and off-campus. If you would like to speak with someone confidentially, the Student Counseling Center (865-974-2196) and the Student Health Center (865-974-3135) are both confidential resources. For additional resources and information, visit [titleix.utk.edu](http://titleix.utk.edu).

## **ASSIGNMENTS, ASSESSMENTS, AND EVALUATIONS**

### **Academic Integrity**

Students should be familiar and maintain their *Academic Integrity* described in <https://hilltopics.utk.edu/academics/>, p. 15 as: "*Study, preparation and presentation should involve at all times the student's own work, unless it has been clearly specified that work is to be a team effort. Academic honesty requires that the student present his or her own work in all academic projects, including tests, papers, homework, and class presentation. When incorporating the work of other scholars and writers into a project, the student must accurately cite the source of that work.*"

Students should abide by the **Honor Statement** (<https://hilltopics.utk.edu/student-code-of-conduct/> Section X. Honor Statement)

*"As a student of the University, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity."*

### **Plagiarism**

Plagiarism in any of its several forms is intolerable, and attention to matters of documentation in all written work is expected and required. Inadvertence, alleged lack of

understanding, or avowed ignorance of the various types of plagiarism are not acceptable excuses.

*Specific examples of plagiarism are:*

1. Copying without proper documentation (quotation marks and a citation) written or spoken words, phrases, or sentences from any source;
2. Summarizing without proper documentation (usually a citation) ideas from another source (unless such information is recognized as common knowledge);
3. Borrowing facts, statistics, graphs, pictorial representations, or phrases without acknowledging the source (unless such information is recognized as common knowledge);
4. Collaborating on a graded assignment without the instructor's approval;
5. Submitting work, either in whole or in part, created by a professional service and used without attribution (e.g., paper, speech, bibliography, or photograph).

Students who may be unsure of the nature of plagiarism should consult the instructor or a guide for writing research reports. (Additional resources are available at <http://www.lib.utk.edu/instruction/plagiarism>.)

Infractions of academic integrity are penalized according to the severity of the infraction but may include a course grade of "F."

## Assignments and Grading

ASSIGNMENT	POINTS
Class Attendance & Participation	100
Course Journals	100
Exercises	250
Labs	200
Project	350
Total:	1000

### **Class Attendance & Participation (100 points)**

Prepared attendance is important for this course, given the nature of the subject. Students are expected to have read the material before the class and contribute to the discussion and other activities.

If you must miss a class for whatever reason, you are still responsible for the material covered. The UTK School of Information Sciences (SIS) does not recommend that students attend online classes while driving or riding in motorized vehicles. Zoom for smartphones or tablets may not support certain functions. Classes are recorded, and you can replay to make up the missed classes. See the Texting While Driving Law (TCA 55-8-199).

Conferences with the instructor: you are strongly encouraged to meet with the instructor in person or online. Many students find such meetings helpful, especially during their projects and labs.

You are required to hold at least one meeting with the instructor no later than the set due date using interactive methods such as Skype or Zoom. Please contact me early

in the semester to schedule the meeting. You should meet about your project before the first due date to get my feedback.

### **Course Journals (100 points)**

Becoming a reflective learner is very important for career success in IT! Write structured journal entries for important incidents during your learning: 1) your “Aha!” moments; 2) know-how you figured out that can be used later or shared with others; 3) a debugging episode—what was your strategy to tackle the problem; 4) a lesson learned from a mistake—if you would do the task again, what might you do? Throughout the semester, you will write about these significant learning experiences and reflect on your growth. Be succinct!

### **Exercises (250 points)**

The exercises aim to review concepts and reinforce understanding. The exercise questions are implemented using the “Practice Quiz” module so that you will receive the system feedback instantly. If you missed a question, you could analyze if you have not mastered the concept or if the question is vague. If you wish, you can redo the entire exercise (but be reminded that the system could not be set up to do only the missed questions). I recommend you to write a journal to reflect on the question(s) you answer that do not match the book-provided answer instead of doing the exercise again for the points. The exercises are not graded. You are credited for completing each by the due date; late assignments will lose points unless a prior agreed arrangement is made on the new submission date.

Exercise 1 – chapter 1

Exercise 2 – chapter 2

Exercise 3 – chapter 4

Exercise 4 – chapter 6

Exercise 5 – chapter 7

### **Labs (200 points)**

Learning-by-doing! Labs are important hands-on practices to develop information technology skills. These labs are designed for practicing basic DBMS skills: implementing data structures and using SQL. However, many of the advanced database skills can only be built by exploring the software to develop adequate mental models and through troubleshooting. MS Access has a good visual interface and provides error messages. It is suitable for learning using a trial and error approach. It also can support real-world projects of individual researchers or small organizations.

Lab 1 – Create Data Structure (Access)

Lab 2 – Basic Queries (One Table)

Lab 3 – Advanced Queries (Multiple Tables)

### **Project (350 points)**

Students must complete a hands-on project either as an individual project or as a team. In real-world settings, a database is mostly designed, developed, and maintained by a team. A good team will make learning-about and learning-by-doing much easier and fun with the support of teammates. However, the online learning mode makes the collaboration of database projects difficult. I will accept individual projects.

Database design and prototyping. Select a scenario or a real-world environment to do needs analysis, conceptual design, and a prototype. I will help you along the process. [The focus of this project is back-end: data structure and integrity, and queries to retrieve data; a simple interface as a menu can be easily set up in Access]. Each project team will receive the same points unless issues arise.

### **Due Dates and Late Assignments**

Unless arrangements are made in advance, late work will receive a penalty of 10 points per day past the designated due date. I strongly encourage you to reach out if you will be unable to complete an assignment by the due date, and I will do my best to accommodate your situation.

### **Incompletes**

Based on adopted University of Tennessee-Knoxville and SIS policy, a grade of *I* (Incomplete) is reserved for emergencies that prevent the student from completing the course on time. Incompletes are granted only under "the most unusual of circumstances" and solely at the discretion of the instructor. Plan your semester's course of study carefully to insure sufficient time to complete the required work.

For students who simply "disappear" without contacting the instructor and without completing the required form, an "F" is submitted.

### **Assigning Grades**

Please note that I do not assign letter grades for individual assignments, but will mark your assignments with my comments and provide a point score based on the possible points earned for that assignment. Your final grade will be based on total points earned/total possible points over the course of the semester.

### **Evaluation**

Semester grades will be assigned according to the following scale:

A	93≤	(4 quality points per semester hour) superior performance.
A-	90- 92.99	(3.7 quality points per semester credit hour) intermediate grade performance.
B+	88- 89.99	(3.5 quality points per semester hour) better than satisfactory performance.
B	83- 87.99	(3 quality points per semester hour) satisfactory performance.
B-	80- 82.99	(2.7 quality points per semester credit hour) intermediate grade performance.
C+	78- 79.99	(2.5 quality points per semester hour) less than satisfactory performance.

C	70-77.99	(2 quality points per semester hour) performance well below the standard expected of graduate students.
D	60-69.99	(1 quality point per semester hour) clearly unsatisfactory performance and cannot be used to satisfy degree requirements.
F	59.99≥	(no quality points) extremely unsatisfactory performance and cannot be used to satisfy degree requirements.
I		(no quality points) a temporary grade indicating that the student has performed satisfactorily in the course but, due to unforeseen circumstances, has been unable to finish all requirements. An I is not given to enable a student to do additional work to raise a deficient grade. The instructor, in consultation with the student, decides the terms for the removal of the I, including the time limit for removal. If the I is not removed within one calendar year, the grade will be changed to an F. The course will not be counted in the cumulative grade point average until a final grade is assigned. No student may graduate with an I on the record.
S/NC		(carries credit hours, but no quality points) S is equivalent to a grade of B or better, and NC means no credit earned. A grade of Satisfactory/No Credit is allowed only where indicated in the course description in the <i>Graduate Catalog</i> . The number of Satisfactory/No Credit courses in a student's program is limited to one-fourth of the total credit hours required.
P/NP		(carries credit hours, but no quality points) P indicates progress toward completion of a thesis or dissertation. NP indicates no progress or inadequate progress.
W		(carries no credit hours or quality points) indicates that the student officially withdrew from the course.

## Course Evaluation

You will be invited to evaluate the course at the end of the term. Please participate in this valuable process. I also invite your comments throughout the course and read all comments, suggestions, and recommendations.

## MSIS Program Outcomes

It is our vision to provide a quality educational program, and for students to have the very best educational experience possible. By the end of their time in the MSIS program, each student should be able to:

1. Describe and discuss the processes of creation, organization, distribution, storage, access, retrieval, management, use, and preservation of information.
2. Describe and discuss the nature of leadership and management in the information professions and the importance of participation in the global information society.
3. Apply the general principles, values, and ethical standards of providing information services in a variety of settings and for diverse populations.
4. Comply with the changing responsibilities of the information professional in a culturally diverse and networked global society.
5. Identify critical professional issues in a variety of organizational, cultural, societal, disciplinary, transdisciplinary, and historical contexts.
6. Analyze and apply standards or policies related to the processes of creation, organization, distribution, storage, access, retrieval, management, use or preservation of information.
7. Explain the changing nature of information, information needs, and information behavior.
8. Assess and implement information technologies, systems, sources, and services that serve users effectively and efficiently.
9. Analyze research and apply it to information practice.

## Assignments: Descriptions, Due Dates, and Program Outcomes for SLC

This table identifies the MSIS Program Outcome(s) addressed in course assignment(s):

Assignment	MSIS Program Outcome
Lab 1	6, 7, 8
Project	6, 7, 8

This table provides a brief summary of assignment names, due dates, and grade distribution.

Assignment	Value	Due Date
Exercise: Chapter 1	50	Sep. 2, 2022
Exercise: Chapter 2	50	Sep. 16, 2022
Project: Database Design & Prototyping	50	Sep. 30, 2022
Exercise: Chapter 4	50	Oct. 7, 2022
Lab 1: Database Structure	80	Oct. 21, 2022
Exercise: Chapter 6	50	Oct. 28, 2022
Lab 2: Basic Queries	60	Nov. 4, 2022
Exercise: Chapter 7	50	Nov. 11, 2022
Lab 3: Advanced Queries	60	Nov. 18, 2022
Project: Presentation	50	Dec. 1, 2022
Project: Final Submission	250	Dec. 16, 2022
Journals	100	Throughout
Attendance	100	Throughout
<b>TOTAL</b>	<b>1000</b>	

### DISCLAIMER

Please be aware that revisions may be made to this syllabus over the course of the semester, and as such, the content contained within may be subject to change. Please refer to Canvas for announcements, calendar changes, and syllabus updates.