BOWIE STATE UNIVERSITY
School of Arts and Sciences
Department of Computer Science
Course Syllabus

COSC 431.100/431.400/531.101.531.400
Database Management [3 Credits] [Fall 2025]
Wednesday, 04:55 PM – 07:25 PM **(In-person)**

INSTRUCTOR:	Dr. Sreenivasan Ramasamy Ramamurthy
OFFICE HOURS:	Tuesday and Wednesday, 01:00 PM – 03:00 PM
OFFICE HOURS LOCATION:	Room 219, Computer Science Building
EMAIL:	sramamurthy@bowiestate.edu

COURSE DESCRIPTION for COSC431 – This course is an introduction to concepts, design objectives, tools, and principles of database management system software. Descriptors, structures, database system architectures, entities, relationships, and data models. The relational, network, and hierarchical database models, normal forms, and canonical data structures will be studied as a basis for logical organization. Relational algebra and calculus, introduction to concurrency, and transaction management are studied.
Prerequisite(s): COSC 214

COURSE DESCRIPTION for COSC531– Introduction to database design and database information management systems. Discussions of the various types of data and information models, such as hierarchical, network, relational, entity-relation, and object-oriented models. Functional dependencies and data normalization. An in-depth look into relational database systems and query languages.
Prerequisite(s): COSC 504

Required Textbook:

Michael Mannino, "Database: Design, Application Development, & Administration", 7th Edition, Chicago Business Press, 2019, ISBN-13: 978-1-948426-00-8

Useful References:

Required Supplies:

Student Outcomes for CS Program (SOs)
Fill in the list of SOs supported by this course.
COSC Course number here supports Student Outcomes (1, 2, 3, 6)

SO1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
SO2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
SO3. Communicate effectively in a variety of professional contexts.

SO4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
SO5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
SO6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

COURSE OBJECTIVES (COs)

Upon completion of this course, the student will be able to:

1. Entity-Relationship Diagrams (SO 2.1 – Quiz 1, SO 2.2 – Quiz 2)
2. Normalization of tables (SO 1.1 – Quiz 4, SO 1.2 – HW 3, SO 1.3 - Final Exam)
3. Relational algebra and functional dependencies in relation to SQL and table normalization respectively (SO6.1 – Quiz 2)
4. Apply appropriate software tools to write and execute SQL commands that address given requirements. (SO 6.3 – Quiz 3)
5. Design & Implementation of an example database system (SO6.1 - Project#1)
6. Writing a term paper on database security (SO3.1 - Research paper)

TEACHING MODES

All course material will be provided on a course web site including lecture notes, useful links on the web, recommended references, time schedule, and contact information for faculty, guidelines for projects, coding standards, and more. The primary teaching mode will be lecture and lab.

COURSE POLICIES

- Follow the postings on Blackboard regularly.
- Be on time and take an active role in class discussions.
- Sign the attendance sheet to record your presence in the classroom.
- Solve and submit all assignments on time.
- Respect the rights of others seeking to learn.
- Turn off (or set to vibrate mode) all electronic devices like cell phones and pagers.
- Maintain a professional outlook in speech and attire.
- Credit sources when any graded work involves any type of collaboration (individuals, groups, internet etc.).
- Plagiarism and uncredited sources will result in grade penalties.

POLICY REGARDING ACADEMIC INTEGRITY: Students are expected to conform to a strict standard of academic honesty. Students are required to do all work individually unless specified otherwise by the instructor. Collaboration resulting in plagiarism is considered cheating and will be subject to discipline. Cheating on examinations, plagiarism, unauthorized collaboration with others on assignments, submitting without authorization duplicate assignments for credit in more than one course, and improper acknowledgment of sources of material are intolerable offenses that carry serious penalties. Penalties may consist of a failing grade on the affected assignment, a failing grade in the course, or more severe discipline imposed by the University scholastic standards committee.

In a nutshell,

- Everything you submit for assignments, quizzes, and exams must be original work written by you. Acts of plagiarism are strictly prohibited. The minimum penalty for plagiarism is a zero on the assignment/quiz/exam for a first, "minor offence"; more severe penalties may be recommended.
- University policy regarding academic honesty: Students are expected to conform to a strict standard of academic honesty. Cheating on examinations, plagiarism, unauthorized collaboration with others on assignments, submitting without authorization duplicate assignments for credit in more than one course, and improper acknowledgement of sources of material are intolerable offenses that carry serious penalties.
- Students are expected to adhere to the high standards of the Bowie State University Code of Student Conduct.

Devices Policy:

- The use of mobile devices such as cellphones and headphones are prohibited during class.

Late Submission Policy:

This class will provide a generous late policy. This helps us avoid judging the relative challenges of exceptional circumstances that arise in the class. Due to these policies, *please do not ask the faculty to waive late deductions or give extra late days*, except for truly exceptional circumstances that merit it.

- **Penalties:** Late homework will be penalized at a rate of 1% per hour, rounding to the nearest hour, ties away from zero. For example, if the homework is due Monday at 11:59:59pm, homework submitted until Tuesday 12:30am will be accepted with no penalty. After 12:30, there is a 1% penalty. If you submit it Wednesday 6:30am, there is a 30% penalty. This is applied as percentage points off. For instance, if you got a 90 and you were 20 hours late, it is now a 70. The penalties will be applied in a way that maximizes your overall score.
- **Late Hour Waiver:** You have 20 late hours over the semester that you can use on **homework**. Each late hour removes one late hour of penalty. For instance, if you submit one homework assignment 10 hours late, another 5 hours late, and the rest on time, then there are no penalties. This is meant to cover for unexpected things that may happen (e.g., food poisoning, a surprisingly difficult homework in this or another class, an interview, an alien abduction, etc, etc.) and is done automatically using Blackboard.
- **Solution:** The solution to HWs will be made available after the penalty eats away all the points you could grab. Once the solution is made available, the **HWs will not be accepted** by any means.

Late Hours and Projects: Late hours **do not** apply to projects as they are to be submitted towards the end of the semester, typically on the last day of the classes.

Make-Up Work:

- No make-up quizzes/exams/assignments will be allowed without prior arrangements being made. Make-ups will be allowed only for emergency reasons. Proper documentation should be provided to validate the reasons.

Attendance Policy:

Regular attendance in the class is mandatory. University rules and regulations state that a student may fail a course if the student misses a certain number of classes [six (6) for a course that meets three (3) times a week; four (4)

for a class that meets twice a week; and two (2) for a class that meets once a week]. Students will be responsible for any loss of information, assignments, and projects due to absence from class.

- Students are expected to maintain regular attendance at class and examination periods. Active, regular participation is essential for success in this class.
- Attendance will be taken randomly. If you are not present when the attendance is taken, you will be marked absent.

Assessments:

Group assignments will be mainly in class with a few take-home components. Homework assignments involve writing programs to meet the given specifications or surveying the literature. For each test, you can bring one cheat sheet of handwritten notes (not typed) with your name on it. The size of the sheet cannot be over a letter size paper.

Grade Appeal Policy

Students who have documentation that an error was made in the determination of a course grade or desire to appeal a grade due to alleged arbitrary and capricious grading must first discuss the concern with the faculty member involved. If there are unresolved issues, the student may initiate the grade appeal process. The student must direct the appeal in writing, with documentation, through the appropriate channels: Instructor, Department Chair, School Dean, and Provost. If a course assignment grade is in dispute, the student must initiate the appeal no later than ten (10) working days after receiving the grade. If a final grade is in dispute, the student must submit an appeal no later than thirty (30) days from the end of the semester during which the grade was received. Procedures are detailed below.

- The student must initially consult with the instructor for a satisfactory resolution of the appeal. If the instructor is no longer with the University or if the student is unable to resolve the issue with the instructor, the student must present the complaint in writing to the Department Chair.
- The Department Chair will convene a Departmental Appeals Committee for resolution. If the student is not satisfied with the decision of the Departmental Appeals Committee, the Chair renders a decision.
- If the complaint cannot be resolved at the Departmental level, the student must present the complaint in writing to the School Dean within fifteen (15) days after receiving notification of the Department's decision.
- The School Dean will render a final resolution.

Course Grade Derivation

Attendance	10%
Homework	15%
Midterm Exam	20%
Projects/Quizzes/Paper	25%
Final Exam	30%

Letter Grade Assignment

A—90.0% -100%
B—80.0% -89.999%
C—70.0% -79.999%
D—50.0% -69.999% **(For undergraduate COSC 431 students)**
F—0% -59.999%

Weekly Time Schedule

Week	Topics	Reading	Assessment
1	Introduction to Database: DBMS	Read Chapter 1	HW0
2	Introduction to Database development	Read chapter 2	
3	Data Model, Relational Model, Relational Algebra	Read chapters 3	Quiz 1
4	Data Model, Relational Model, Relational Algebra	Read chapter 3	HW 1
5	Data Model, Relational Model, Relational Algebra	Read chapter 3	Quiz 2
6	Structured Query Language (DDL, DML, DQL)	Read chapter 4	HW 2
7	Structured Query Language (DDL, DML, DQL)	Read chapter 4	Quiz 3
8	Structured Query Language (DDL, DML, DQL)	Read chapter 4	Midterm Exam
9	Spring Break		
10	Designing Relational Database Entity Relationship Diagrams	Read Chapter 5	Project Announcement and Topic Selection
11	Designing Relational Database Entity Relationship Diagrams	Read Chapter 6	Research Paper Topic Selection
12	Normalization of Tables	Read Chapter 7	HW 3
13	Normalization of Tables	Read Chapter 7	Quiz 4
14	Physical Database Design	Read Chapter 8	Research Paper Due
15	Security in Database Management Systems and review for Final Exam	Supplementary Material	Project Due
16	Final Exam		

IMPORTANT TELEPHONE NUMBERS:

Computer Science Department (Mr. Antoine Thiam):	(301) 860-3961
Computer Science Department (Fax):	(301) 860-3979
Bowie State University (Main):	(301) 860-4000

In case of inclement weather (snow etc.)
please call (301) 860-4000 to find out if the University is open.

AMERICAN DISABILITY ACT (ADA) AND NONDISCRIMINATION POLICY

- Bowie State University is committed to creating inclusive and accessible learning environments consistent with federal and state law. If you have registered with Disability Support Services (DSS) and an accommodation notification was sent on your behalf, please schedule a meeting with me to discuss how your accommodation will be implemented in this course. Students who have a permanent disability or temporary health condition that requires accommodation should contact Disability Support Services immediately. You may email: dss@bowiestate.edu , call 301-860-4085 or stop by their office: Thurgood Marshall Library, lower-level, RM# 078. Our website provides guidance on how to register with Disability Support Services: https://www.bowiestate.edu/academics/support-services/disability-support-services/request-services/ It is important that you reach out early to ensure adequate time to process your accommodation request and establish an approved plan, if necessary. Please note that approved accommodations are not retroactive.
- Bowie State University shall not discriminate against any individual on the basis of race, color, religion, age, ancestry or national origin, sex, sexual orientation, gender identity, disability, marital status, or veteran status.