COSC 3318
Database Management Systems
3 credit hours
Spring Semester 2018
Computer Science Department

Class meeting information: 12:30 – 1:50 TR   **Room**: AB1 206

Professor: Bing Zhou, Ph.D.   **E-mail:** zhou@shsu.edu
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                                                                             URL: http://www.shsu.edu/~bxz003

Office Hours: TR 2:00-5:00pm

Catalog Description: This course emphasizes the design of information systems using database software and query language/programming interfaces. Data warehouse concepts are introduced. Legacy systems, LAN and distributed systems based systems are used to give the student hands-on experience in system development.

Prerequisite: COSC 1437

Course Objectives: The student will learn how to use a database management system to record data and provide users with access to that data. The student will become familiar with the use of at least one declarative query language (SQL) and how to utilize it from within programs written in some other language. The student will learn the importance of appropriate database design techniques for preserving the integrity of the data.

Instructor's objectives: 1) Gaining a basic understanding of the subject (e.g., factual knowledge, methods, principles, generalizations, theories);
                                        2) Learning fundamental principles, generalizations, or theories.

ABET Student Outcomes: Based on ABET student outcomes, at the end of this course the ideal student should be able to present the following abilities.
   (a) an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;
   (b) an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;
   (c) an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;
   (i) an ability to use current techniques, skills, and tools necessary for computing practice;

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[1] If the grading policy or some other aspect of this syllabus must be adjusted, the class will be notified and any concerns regarding the change should be brought before the professor prior to the end of the semester for resolution.

(k) an ability to apply design and development principles in the construction of software systems of varying complexity.

Required Text Book: First Course in Database Systems, 3rd ed., by Ullman and Widom (ISBN: 9780136006374).

Optional materials: SQLite Administrator (or MySQL, PostgreSQL, Oracle, SQL Server, etc.) should be downloaded and installed on a computer for trying examples and testing homework answers. An alternative reference for the SQL language may be helpful during those sections of the course on SQL.

Course Outline:
Chapter 1: Introduction and history of DBMS
Chapter 2: Relational model
Chapter 3: Relational algebras
Chapter 4: SQL query and subquery
Chapter 5: Data definition and modification in SQL, constraints in relational algebra and SQL
Chapter 6: Extended operators in SQL and relational algebra, transactions, views and index
Chapter 7: The entity-relationship model
Chapter 8: Constraints in entity-relationship models
Chapter 9 SQL environments
Chapter 10: Functional dependencies
Chapter 11 Manipulating functional dependencies
Chapter 12 BCNF and normalization
Chapter 13 Third Normal Form
Chapter 14 Multivalued dependencies and fourth normal form

Project: The goal of the class project is to design, document, and implement a database system application with an appropriate user interface. The project includes the following activities spread over the entire semester:

- Identify an application area for which database systems may prove beneficial,
- Determine the functionalities of the database application,
- Model the data stored in the database (Identify the entities, roles, relationships, constraints, etc.),
- Design, normalize, and perfect the relational database schema,
- Write the SQL commands to create the database, find appropriate data, and populate the database, and
- Finally and most importantly, write the software needed to embed the database system in the application.

The end result should be a functioning application that runs native and/or on the web and that uses your database to allow useful functionality.

A group of 3-5 students should do each project. You are free to choose your own project members; if you would like the instructor to assign you to a group, say so in class. There will be three project assignments: project proposal, project report including source code for implementation, and class

presentation. Each group should turn in a single solution to each assignment. Every member of the group will get the same grade.

Exams: Three exams verify that the student is able to remember knowledge and apply skills learned in the course. Late exams are not permitted unless the student can document the serious situation[2] that caused this to occur. Students need to attend **ALL** three exams in order to get a final grade.

Grading Plan:

Homework	25%	
Project	25%	
Proposal		5%
Report and implementation		15%
Presentation		5%
First Exam	15%	
Second Exam	15%	
Third Exam	15%	
Student Participation	5% (Students have more than three absences during the semester will lose the participation credit.)	

Attendance Policy: In accordance with University Policy (http://www.shsu.edu/students/guide/polpro/attendance.html), regular attendance is required and your attendance will be seriously monitored. So, don't forget to give your signature on the roster. Students are expected to arrive to the classroom on time, otherwise no full attendance credit for the day will be given. You are responsible for all material covered in classes, regardless of whether you attended or not. It is your responsibility to obtain class materials and class schedule information from fellow classmates if you miss a class.

Students are also expected to pay attention during lectures, to be respectful listening when the instructor or your peers are speaking, and to be fully engaged in your learning without texting, checking your phone or email, or participating in other digital distractions. If you are distracting others in your lack of participation, you will hear from instructor via email or in a short face-to-face conference before, during or after class, and participation points will be taken away throughout the semester.

Academic Dishonesty: All work must be your own or with sources and assistance clearly documented (even group assignments should include who was in your group). See Student Guidelines, Dean of Students Policies, Code of Student Conduct and Discipline (http://www.shsu.edu/students/guide/dean/codeofconduct.html) for a description of academic dishonesty and the appeals process. Unauthorized collusion may earn students involved a zero for the work. Repeated or serious cases of academic dishonesty will result in a grade of F and possibly further

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[2] Traditionally "excused" absences include illness serious enough to justify a note from a doctor or clinic, accidents with witnesses, police reports, hospital stays, etc., that indicate they were serious enough to prevent the student from taking an exam, and deaths or serious conditions of a member of the family or loved one. The latter can be documented with contact information, news clipping, doctor's note, etc. Planned absences must be resolved prior to the absence.

disciplinary action. Protect your work from copying and document any code or examples you obtain from books, the Internet, tutors, or friends.

Classroom Rules of Conduct: In compliance with the [University Code of Conduct](#), students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university. Students should turn off or mute their cellular phones and/or pagers before class begins. Students are prohibited from using tobacco products, making offensive remarks, using inappropriate language, reading newspapers, socializing at inappropriate times, wearing inappropriate clothing, or engaging in any other form of distraction. Students will be warned, then directed to leave the class and/or report to the Dean of Students for disciplinary action in accordance with university policy.

Visitors in the Classroom: Occasional visiting of classes by responsible persons is allowed with prior arrangement with the instructor, as long as it does not interfere with the registered members of the class or the educational process.

STUDENTS WITH DISABILITIES POLICY: It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail disability@shsu.edu). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Services for Students with Disabilities. For a complete listing of the university policy, see:

http://www.shsu.edu/dept/academic-affairs/documents/aps/students/811006.pdf

Religious Holidays: University policy states that a student who is absent from class for the observance of a religious holy day may take an examination or complete an assignment scheduled for that day within a reasonable time after the absence if the professor is informed, in advance. Whenever possible, the student should make arrangements with the instructor at least one week in advance to make up work (see attendance policy).