Introduction to Database Systems

Homepage:
The home page for this course is hosted at:
 http://www.eecs.wsu.edu/~arslanay/CptS451/
The course announcements, lecture notes, homeworks, and homework solutions will be posted on **Blackboard**.

Class Meeting Times and Location:
Tue-Thu   12:00pm- 1:15pm, Sloan 175   (Jan 10—Apr27)

Instructor:
Name: Sakire Arslan Ay
Office: Sloan 311
Telephone: (509)335-4089
E-mail: sakire.arslanay@wsu.edu
Office Hours: Mon, Wed, Fri: 12:10pm-1:10pm;
            Tue, Thu: 1:20pm-2:20pm

Teaching Assistant:
Name: Kudrat Kaur
Office: EME 6
E-mail: kudrat.kaur@wsu.edu
Office Hours: Mon, Wed: 2:00pm-3:00pm

Text Book and Reading Materials:
Required Textbook:
[DMS] Database Management Systems (3rd Edition), Raghu Ramakrishnan, Johannes Gehrke,
ISBN-13: 978-0072465631 ISBN-10: 0072465638 McGraw-Hill , 2003
   - Also known as the "*Cow Book*"

Recommended Reading:
[DS-CB] Database Systems: The Complete Book (2nd Edition), Hector Garcia-Molina, Jeffrey Ullman, Jennifer Widom, ISBN: 0131873253 Pearson , 2009

Course Overview:
This course provides students with an introduction to the design of databases and the use of database management systems for applications. We will cover the design and implementation of traditional relational database systems as well as advanced data management systems. We will discuss the fundamental principles of databases such as the (ER) approach to database design, the relational model, relational design theory, abstract query language such as relational algebra, and programming in SQL. Students will get exposure to how relational database management systems are used to implement a database. We will also cover core database implementation issues including storage and indexing, query processing and optimization, and transaction management.

Prerequisites: "Cpts 223 Advanced Data Structures", " Cpts 224 - Programming Tools"

Course Format:
The CptS451 class meets twice a week for lectures. Lecture notes will be made available online at Blackboard (https://learn.wsu.edu). While the lectures are designed to be clear and self-contained, you are **required** to read the assigned chapters in the course textbook (Gehrke et al - see above).

Outline:

Topics	Reading Material		# of Lectures
Overview of Database Systems	DMS Ch 1	DS-CB Ch 1	1
Project Overview and JSON Data			1
Introduction to Database Design – ER Model	DMS Ch 2	DS-CB Ch 4	2
Relational Model	DMS Ch 3	DS-CB Ch 2	3
Relational Algebra	DMS Ch 4	DS-CB Ch 2,5	2
SQL Overview: Queries, Constraints and Triggers	DMS Ch 5	DS-CB Ch 6,7,8,10	7
Database Application Development, Stored procedures	DMS Ch 6	DS-CB Ch 9	1
Database Design Theory and Normal Forms	DMS Ch 19	DS-CB Ch 3	3
Storage and Indexing	DMS Ch 8,9,10,11	DS-CB Ch 13,14	3
Query Execution	DMS Ch 12,14,	DS-CB Ch 15,16	3
Query Optimization	DMS Ch 15	DS-CB Ch 15,16	1
Transaction Management	DMS Ch 16		1

Grading Scale:

The below percentages are subject to change as circumstances dictate.

Overall Grading:
1. Midterm……………………………………………………………… 20%
2. Final……………………………………………………….…… 23%
3. Project…………………………………………………………… 30%
4. Homework assignments…………………………………….……...22%
5. In class attendance…………………………….….……………….5%
                                                                                100%

HW and Project Grading:
The weights of the project milestones are as follows:
1. Milestone 1 (DB application development…………………..…… 3%
                        JSON Parsing)……. ……………………………………2%
2. Milestone 2 (Relations, Constraints, SQL DDL, Populate DB,
                        Assertions, Triggers)…..…… …………….……….......10%
3. Milestone 3 (Application to search businesses)…..…… ………..…. 15%
TOTAL…………..………………………………………………………..…...30%

Homework assignment weights will be announced later.

Letter Grades:
Letter grades will be assigned based on the scale shown below. **The assignment and exam scores will be adjusted (curved) according to the class averages.** The below scale assumes class average is 80%.

Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	F
Total Score	93% - 100%	90% - 93%	86% - 90%	83% - 86%	80% - 83%	76% - 80%	73% - 76%	70% - 73%	66% - 70%	60% - 66%	0% - 60%

Homework Assignments:
There will be total 7 homework assignments (around every 7 to 10 days). The HW assignments will be posted on Blackboard. The tentative deadlines for HWs are listed on the course schedule on Blackboard. Please check the announcements regularly for updates. First few HWs will be submitted as hard-copy and will be due in class. Later HWs will be submitted electronically on Blackboard. The submission instructions for the HWs will be provided along with the HW descriptions.
Homework assignments turned in "late" shall be penalized at a rate of 10% per day. The students who have valid excuses may request extension on HW until one day before the deadline. A student may request at most 1 excused extension. **All homework and exams must be solved and written independently**, otherwise you will be reported to the WSU Office of Student Conduct for plagiarism and you will receive 0 for all HW assignments (22% of your grade). If you attempt a second time (i.e., cheat in any other course deliverable), you will receive "F" for the course.

Project:
In your semester long CptS451 project you will gain experience in database modeling, design, loading, querying and updates. The progress of semester-long project will be measured by 3 milestones. The objectives, requirements, and deliverables of each milestone will be posted in the project description.

Project Teams: You will work on the project as teams of 2. At the end of the semester, each student will fill out and submit a Peer Review form and evaluate his/her team member.

All project work must be done by the team members. If your code is substantially similar to another team's submission or the submissions from prior years, you will be reported to the WSU Office of Student Conduct for plagiarism and you will receive 0 for all HW assignments (30% of your grade). If you attempt a second time (i.e., cheat in any other course deliverable), you will receive "F" for the course. We will process all programming assignment submissions (including prior years' submissions) using Stanford's free plagiarism detection software called MOSS (https://theory.stanford.edu/~aiken/moss/).

Project Submission: Unless posted, project documents shall be submitted electronically on Blackboard (one submission per team)**.** Late penalty is 10% point deduction per day. Late project deliverables may be turned up to 5 days after the original due date. Exceptions/extensions can be given to students with valid excuse. Students need to provide evidence for their excuse and must notify the instructor beforehand for the late submission.

Database Access:
You will use PostgreSQL database platform for the course project and HWs. You are allowed to use the standard SQL functionality and features only. Please check with the instructor if you are planning to use a PostgreSQL specific feature.
You can download PostgreSQL for free at the link https://www.postgresql.org/download/.

Exams:
There will be one midterm and one final. Midterm will cover all material covered until the midterm date. The tentative midterm date is **March 9th** 2017 (see the schedule). The Final Exam will be comprehensive and cover all of the course material. The majority (70%+) of this exam will focus on the material presented after the mid-term exam. Both exams will be given in class.

Attendance:
Attendance is expected at all lectures. We will be using a "classroom response system" (CRS) that allows me to get responses from all students present instead of just a vocal few. You need to bring your laptop or web-capable phone or tablet to each class session to use the system. You are expected to respond thoughtfully each

time. Markedly deficient response rates may negatively affect your grade. The CRS will also be used to take attendance each day.

5% of your course grade will be based on your attendance. In addition, if you are absent more than 5 times without a valid excuse your course grade may be lowered by two-thirds of a grade -- that is from an A to a A-, from a C to a C-.

Student Work Load for CptS 451:
CptS 451 is a 3-credit course. The 3-credit designation normally implies that on average the student is expected to spend 3hrs ("lectures") + 6hrs ("homework+projects+exams") = 9 hours per week working on this course.

Academic Integrity:
Academic integrity will be strongly enforced in this course. Students who violate WSU's Academic Integrity Policy (identified in Washington Administrative Code (WAC) 504-26-010(3) and -404) will fail the assignment and the course, will not have the option to withdraw from the course pending an appeal, and will be reported to the Office of Student Conduct.
Cheating includes, but is not limited to, plagiarism and unauthorized collaboration as defined in the Standards of Conduct for Students, WAC 504-26-010(3). You need to read and understand all of the definitions of cheating: http://app.leg.wa.gov/WAC/default.aspx?cite=504-26-010. If you have any questions about what is and is not allowed in this course, you should ask course instructors before proceeding.
If you wish to appeal a faculty member's decision relating to academic integrity, please use the form available at conduct.wsu.edu.

Students with Disabilities:
Students with Disabilities: Reasonable accommodations are available for students with documented disability. If you have a disability and may need accommodations to fully participate in this class, please visit the Access Center (Washington Building 217) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center. Additional information can be viewed at the URL http://drc.wsu.edu

Campus Safety:
 The Campus Safety Plan, which can be found at http://safetyplan.wsu.edu, contains a comprehensive listing of university policies, procedures, statistics, and information relating to campus safety, emergency management, and the health and welfare of the campus community. The left side bar at this safety plan homepage contains many important links to safety information.