Carnegie Mellon
HeinzCollege

95-703: Database Management

Course Information	12-Unit Course

	Instructor: Jeremy Smith
	      Phone: 268 – 8664
	      Email: smithj@andrew.cmu.edu / jcsmith@cmu.edu
	 Office hours: Will be posted on Canvas Website
	
	Teaching Assistants:
	Teaching assistant office hours schedule and zoom links will be posted to Canvas Contacts page
	
	Meeting Times:
	Location:
	
	Class Website: http://www.cmu.edu/canvas

	This course is appropriate for master's students who wish to acquire a technical understanding of relational database systems; their design, development, management and application, while developing knowledge of and skill in using the Oracle Database Management System (DBMS), a popular database platform currently utilized by many organizations.

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Description	Data are recognized as a major organizational resource to be managed like other assets such as land, labor and capital. The ability to structure, access, manage and leverage these important resources is becoming more and more critical to all organizations, large or small, public or private. Central to supporting this ability, and at the core of every information system, is the database. Developments in database technology have produced systems that are more powerful and easier to use, develop, and maintain. This is especially true for relational databases - the predominant database structure used for business applications - and the primary focus of this course. This semester-long core course will address the theory, application and management of relational database technology. The course will cover topics including an overview of the relational data model, understanding entities and relationships, designing logical data models and database design using the process of normalization. We will also learn relational algebra as the theory behind data queries and implement actual data queries using SQL to manage and retrieve data within an Oracle database. To provide students with an opportunity to apply the knowledge they learn from the lectures, readings and various assignments.
Course Materials	For each lecture, the instructor will provide notes and any class material relevant for the lecture. **Suggested Books**: ◈ Casteel, J., "Oracle 12c: SQL," Cengage Learning ◈ Connolly, T. and C. Begg, "Database Systems: A Practical Approach to Design, Implementation, and Management," 6th edition, Addison-Wesley, 2015 ◈ Coronel, C. and S. Morris, "Database Systems: Design, Implementation, & Management," 12th edition, Cengage Learning, 2017 ◈ Hoffer, J. A., R. Venkataraman, and Heikki Topi, "Modern Database Management," 11th edition, Prentice Hall, 2012 ◈ Price, J., "Oracle Database 12c: SQL," Mc Graw Hill, 2014 **Software**: Students MUST have a computer with the Oracle 18c Express edition provided by the Heinz College installed per the instructions provided by The Heinz College. If you have trouble with your installation, please contact Heinz Computing (heinz-computing@andrew.cmu.edu) as soon as possible to ensure that your installation is functional before we begin the SQL topics in the course. *No other components of Oracle Software will be required for this class.*

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Course Objectives	
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	Gain an understanding of relational data models in terms of data structure, data integrity, and data manipulation.
	Understand and create conceptual database models utilizing entity-relationship modeling.
	Design data structures that will limit redundancy and enforce data integrity while conforming to organizational requirements utilizing normalization methodology.
	Understand the theory behind the relational data model as it applies to interactions with current database management systems
	Read and interpret a given data model to query the database and transform the data into information using Structured Query Language (SQL).
	Implement a data model in a current relational database management system.
	Create SQL queries, based on transactional data, including elements such as data groupings and summary values.
	For specific topics covered in this course, please see the Course Schedule
Evaluation Method	Students' performance in the class will be evaluated based on the following components:

Assignments
Final Exam
Group Presentation Project

Assignments:
The class assignments will range from practical conceptual and logical database design to hands on SQL assignments. All SQL assignments will be completed using the Oracle Database 18c Express Edition for Windows.

Exam:
The exam will be a comprehensive closed book, closed notes exam. The exam is to be completed by you individually *without* the help of any other student. The date for the exam is specified in the class schedule. The exam will be graded by the Instructor and TAs. Grades will be posted on Canvas and in the official Student Information System.

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Grading Scale						
	A+	96.67% – 100 %	B+	86.67% – 89.99 %	C+	76.67% – 79.99 %
	A	93.34% – 96.66 %	B	83.34% – 86.66 %	C	73.34% – 76.66 %
	A–	90% – 93.33 %	B–	80% – 83.33 %	C–	70% – 73.33 %

Scores below 70% equate to a failing grade (R). No curve is applied to grades.

Course Policies & Expectations

Lectures:
While no attendance will be taken, it is in your interest to attend each lecture. Class participation is encouraged and expected. As research on learning shows, unexpected noises and movement automatically divert and capture people's attention. Arriving in the classroom late (after a lecture begins), using cell phones, laptops, etc. makes noise, distracts and can affect everyone's learning experience. For this reason, I ask you to show up for each class a few minutes early and refrain from using your electronic devices during class

Laptops During Class:
Laptops may be used during lectures only to view lecture notes to follow along with the lecture. Please plan to take notes on paper.

Missed Classes:
Students are responsible for obtaining class material, which may have been distributed on days when they are absent. I will also try to record the lectures on Canvas for viewing at a later time.

Assignments:
All assignments are due BEFORE the lecture begins on the day specified. Submissions will be uploaded to the Canvas website. Assignments submitted after that deadline, if accepted, may be penalized unless permission is granted by the instructor prior to the due date. Each assignment must be typed (not handwritten) and diagrams created using PowerPoint or an equivalent tool. No collaboration in any form on assignments is allowed.

All assignments are graded by class TAs and reviewed by the instructor before they are returned to students within a week of submission. Suggested solutions will be provided when the graded assignments are returned.

Accommodations for Students with Disabilities:
If you have a disability and are registered with the Office of Disability Resources, I encourage you to use their online system to notify me of your accommodations and discuss your needs with me as early in the semester as possible. I will work with you to ensure that accommodations are provided as appropriate. If you suspect that you may have a disability and would benefit from accommodations but are not yet registered with the Office of Disability Resources, I encourage you to contact them at access@andrew.cmu.edu.

Statement of Support for Students' Health & Well-being	Do your best to maintain a healthy lifestyle this semester by eating well, exercising, avoiding drugs and alcohol, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress. If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, we strongly encourage you to seek support. Counseling and Psychological Services (CaPS) is here to help: call 412-268-2922 and visit their website at http://www.cmu.edu/counseling/. Consider reaching out to a friend, faculty or family member you trust for help getting connected to the support that can help.
Academic Honesty and Integrity	All CMU students are expected to follow the ethical guidelines and adhere to the policies as defined in your Program's Student Handbook or in any other source describing such policies as they apply to students at Carnegie Mellon University. These policies and guidelines are available on the CMU web site. Please read them carefully! You will be held accountable for any violations of these guidelines and policies. Individual assignments must reflect individual effort. Although I expect you to attempt solving each problem on your own, I encourage you to seek help from the class TAs if you struggle with any assignment. Sharing your assignments with any other student in any form (whether it is a paper document, an electronic document such like a MS Word document, or a document in any other format) is not permitted and will be considered cheating. Any "discussion" between students that results in a similar HW submission is also not allowed. If you are in possession of any other person's document or file from this or any other semester, you are in jeopardy. Any violations of academic integrity in this class will have the following consequences: (a) at the minimum, no credit for assignment in question <u>and</u> lowering final grade by one letter (e.g., from B to C); (b) in more serious offenses, failing the class; **All violations of academic integrity are reported to the Associate Dean's Office. Additional penalties may be imposed.**