FALL 2017

**Instructor**
Jeremy Smith  
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(*You may also see smithj@andrew.cmu.edu, these are aliases to the same email account, you can use either one)

Additionally, instant messaging availability is noted on blackboard under the STAFF INFORMATION section of the website

**Teaching Assistants**
*Office hour and contact information will be posted to the course website during the first week of class.

**Audience**
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.

**Course Overview**

Data are now 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.
Required Textbook
- Joan Casteel, Oracle 11g:SQL, Course Technology

Recommended Textbook
  *Other editions are also acceptable, but the noted chapter and page numbers may not match the ones in the schedule

Course Objectives

- Gain a good 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
Class Meetings

This is a distance course as opposed to a self-paced learning course. This means that we have scheduled lecture topics for each week of the semester. We do this to ensure that everyone is learning the same material at the same time. Some of you may be inclined to read ahead and view lectures ahead of time based on your schedules and time availability. If you choose to do that, please keep in mind that class discussions will be focused on the material that is scheduled for the week and assignments will be made available and due at pre-determined times based on the schedule.

Software Requirements

Students MUST have a computer with the Oracle 11g 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 as soon as possible to ensure that your installation is functional before we begin the SQL topics in the course.

A few items about the roles in this course:

- Keep in mind throughout the semester that while we are working from Professor Szczypula’s lecture material, the course schedule, assignments, grading and general course policies are specific to this distance course and may be different than what you hear Professor Szczypula discuss in the lectures.

- Please focus only on the material in the lectures and refer to the syllabus and schedule found on the Blackboard website for this distance course to determine which lecture is the week’s focus and what assignments are coming due.

- The Instructor and TAs in this course are here for a few purposes:
  
  o To guide you through the course and answer questions that you may have from the lecture material.
  o To assist with and answer questions about the homework assignments.
  o To answer general questions about the material, even if it is outside of the bounds of the lecture material.

Please be sure to make use of all of our availability.
Assignments and Grading

Each student’s knowledge of the course material will be evaluated based on a combination of individual homework assignments and a final exam. All homework assignments and the exam are to be individual efforts completed by the submitting student alone. For these assignments, please direct any questions you have to the instructor or the TAs.

Homework assignments will be made available based on the schedule provided. Each assignment will be due the week after it is assigned. Due dates are noted in the course schedule.

While there is no formal assessment of participation in class, regular participation is encouraged and expected. In this distance-format class, most participation is through discussion groups on blackboard. I will occasionally post questions or comments to try to start a conversation, but please feel free to do so yourself as well. These discussions allow students an opportunity to learn from each other and share their own thoughts and experiences. They also provide a central location for general questions that many students may have.

I will create a discussion group topic for each week’s lecture and each homework assignment as well as a few that will remain throughout the semester for general course questions, and Oracle technical questions.

Please post any questions, thoughts, insights, experiences, etc. that you have related to the material to share with the class. The TAs and I will monitor the discussion groups regularly to respond to any posting. Since we do not have the in-class interaction of a local course, the discussion groups are the best method we have to learn from one another.

Final grades in the course are based on the following weights:

Assignments 70%
Final Exam 30%

Final letter grades are assigned to a student’s body of work in this course according to the following scale (there is no curve applied to grades in this course):

A+ 96.67% to 100%
A  93.34% to 96.66%
A- 90% to 93.33%
B+ 86.67% to 89.9%
B  83.34% to 86.66%
B- 80% to 83.33%
C+ 76.67% to 79.9%
C  73.34% to 76.66%
C- 70% to 73.33%
R  less than 70%

The average grade in a core course is expected to be 3.33-3.4 (out of 4), equivalent to a B+. This “expected average” reflects the degree of difficulty and/or breadth of coverage for a core course.
Assignment Due Dates

Due dates for assignments are posted on the course schedule. All assignments must be submitted by the due date/time noted on the assignment posting. Assignments submitted after the deadline without prior approval will be penalized up to and including receiving 0 points for the assignment.

Assignment Extension Requests

Assignment Extension Requests *MAY* be accepted ONLY for extenuating circumstances such as illness or family emergencies.

Do not request an extension due to work or travel schedules.

Prior approval for extensions MUST be requested by the student contacting the instructor as early as possible. Do not request approval from teaching assistants.

Policy on Cheating and Plagiarism

The work students submit should reflect an individual effort. Students are encouraged to discuss course topics with each other, but the final work product must reflect each individual student’s knowledge and effort.

Cheating includes but is not necessarily limited to:

1. Submission of work that is not the student's own for papers, assignments, lab exercises, or exams.
2. Submission or use of falsified data.
3. Theft of or unauthorized access to an exam, current or previous.
4. Use of an alternate, stand-in or proxy during an examination.
5. Use of unauthorized material including textbooks, notes or computer programs in the preparation of an assignment or during an examination, unless otherwise indicated.
6. Supplying or communicating in any way unauthorized information to another student for the preparation of an assignment or during an examination.
7. Collaboration in the preparation of an assignment, unless expressly allowed by the instructor.
8. Plagiarism which includes, but is not limited to, failure to indicate the source with quotation marks or footnotes where appropriate if any of the following are reproduced in the work submitted by a student:

   a. A graphic element.
   b. A proof.
   c. A phrase, written or musical
   d. Specific language.
   e. An idea derived from the work, published or unpublished, of another person.
   f. Program code or algorithms.

Penalties for Cheating

The penalty for cheating on a homework assignment or on an exam is 0 points for the homework assignment / exam.

All incidents of cheating are reported to the Dean. Additional penalties may be imposed.
A Note from The Heinz College - *Take care of yourself*

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.

All of us benefit from support during times of struggle. You are not alone. There are many helpful resources available on campus and an important part of the college experience is learning how to ask for help. Asking for support sooner rather than later is often helpful.

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/](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.

If you or someone you know is feeling suicidal or in danger of self-harm, call someone immediately, day or night:

**CaPS: 412-268-2922**

**Re:solve Crisis Network: 888-796-8226**

If the situation is life threatening, call the police:
- **On campus: CMU Police: 412-268-2323**
- **Off campus: 911**

If you have questions about this or your coursework, please let me know.
Schedule - 95-703 Database Management, Fall 2017
* Lecture and assignment dates are subject to change as needed throughout the semester.
**Lecture numbers/names are based on labels found in streaming lectures online. Link to all streaming lectures is available on course website in SYLLABUS AND SCHEDULE area.

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Other Info</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>Introduction to Database Models &amp; Entity Relationship (ER) Modeling</td>
<td>Suggested Reading: <em>Connolly &amp; Begg</em>, chapters 1-2 View CD Lecture 01_p01</td>
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<tr>
<td>August 28</td>
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<tr>
<td>Week 2</td>
<td>Entity Relationship Diagramming (ERD)</td>
<td>Suggested Reading: <em>Connolly &amp; Begg</em>, chapter 11 View Lecture 01_p02</td>
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<td>September 4</td>
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<td>Homework #1 assigned, Due Wednesday 9/13/17</td>
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<tr>
<td>Week 3</td>
<td>Extended ER Models (EER)</td>
<td>Suggested Reading: <em>Connolly &amp; Begg</em>, chapters 12 View CD Lecture 02_p01</td>
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<td>September 11</td>
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<td>Week 4</td>
<td>Logical Database Design</td>
<td>Suggested Reading: <em>Connolly &amp; Begg</em>, chapter 16 View CD Lecture 02_p02</td>
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<td>September 18</td>
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<td>Week 5</td>
<td>Normalization</td>
<td>Suggested Reading: <em>Connolly &amp; Begg</em>, chapter 13 View CD Lecture 03_p01</td>
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<td>September 25</td>
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<td>Homework #2 assigned, Due Wednesday 10/4/17</td>
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<tr>
<td>Week 6</td>
<td>Advanced Normal Forms</td>
<td>Suggested Reading: <em>Connolly &amp; Begg</em>, chapter 14 View CD Lecture 03_p02</td>
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<td>October 2</td>
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<td>Week 7</td>
<td>Relational Algebra</td>
<td>Suggested Reading: <em>Connolly &amp; Begg</em>, chapter 4 (up to and including section 4.1.3 “Join Operations”) View CD Lectures 04_p01 and 04_p02</td>
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<td>October 9</td>
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<td>Homework #3 assigned, Due Wednesday 10/18/17</td>
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<td>Week</td>
<td>Lecture</td>
<td>Other Info</td>
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<td>Week 8</td>
<td>Intro to SQL / SQL*Plus</td>
<td>Reading: <em>Casteel</em>, chapters 2</td>
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<td>October 16</td>
<td>Lab: Introduction to SQL</td>
<td>View CD Lecture 05_p01</td>
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<td>Week 9</td>
<td>Managing DB Tables &amp; Data Integrity</td>
<td>Reading: <em>Casteel</em>, chapters 3 - 5</td>
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<td>October 23</td>
<td>Data Manipulation &amp; Transaction Control</td>
<td>View CD Lecture 06_p01 and 06_p02</td>
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<tr>
<td>Week 10</td>
<td>Single Table Queries</td>
<td>Reading: <em>Casteel</em>, chapter 8</td>
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<td>October 30</td>
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<td>View CD Lecture 07_p01</td>
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<tr>
<td>Week 11</td>
<td>Multiple Table Queries</td>
<td>Reading: <em>Casteel</em>, chapters 9</td>
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<tr>
<td>November 6</td>
<td>Single Row SQL Functions</td>
<td>View CD Lecture 07_p02 and 08_p01</td>
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<td>Homework #4 assigned, Due Wednesday 11/22/17</td>
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<td>Week 12</td>
<td>Grouping Data</td>
<td>Reading: <em>Casteel</em>, chapter 10 - 11</td>
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<tr>
<td>November 13</td>
<td>Advanced Queries</td>
<td>View CD Lecture 08_p02 and 09_p01</td>
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<td>November 20</td>
<td><em>NO CLASS – THANKSGIVING BREAK</em></td>
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<td>Week 13</td>
<td>Subqueries</td>
<td>Reading: <em>Casteel</em>, chapter 12</td>
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<td>November 27</td>
<td>Analytical SQL</td>
<td>View CD Lecture 09_p02 and 10_p02</td>
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<td>Homework #5 assigned, Due Wednesday 12/13/17</td>
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<td>Week 14</td>
<td>System Catalog Views</td>
<td>View CD Lecture 11_p01</td>
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<td>December 4</td>
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<td>December 11</td>
<td><em>Final (cumulative)</em></td>
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