

GSA 555: Accounting Data Base Modeling and Analysis

California Polytechnic State University, San Luis Obispo

Orfalea College of Business

Fall 2015

Tuesday/Thursday 2:10 p.m. – 4:00 p.m.

Classroom: Business (03) – Room 303

Instructor

Dr. Suzanne Pawlowski
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Office Hours:
* Noon – 2:00, Tuesdays/Thursdays
* Other times by appointment

Course Description

Detailed Course Description

This is a course focusing on: 1) analyzing data and information requirements using standard data modeling techniques, 2) designing, implementing and querying relational databases, 3) securing a database and the data within it, and 4) using XBRL for electronic reporting of financial data. Through lectures, readings, case studies and activities performed in this class, you will develop skills in conceptual data modeling (including E-R and REA modeling), knowledge and expertise in designing databases using the relational data model, and basic programming using SQL and XBRL. Additional topics include distributed database concepts and overview of the audit and control capabilities available in major commercial DBMSs such as Oracle.

Course Catalog Description

Fundamental concepts in database analysis, design, implementation, administration, and audit including issues such as requirements specification, REA modeling, ER modeling, normalization, SQL, transaction control, database security, and query optimization. May also include topics such as data warehouses, XBRL and ebXML.

Learning Objectives

There are two *key learning objectives* associated with this class.

1. Competency in Database Systems
 - a. Demonstrate the ability to design, develop and use databases to analyze business and auditing information. (LO 3.1; LO 4.1)
2. Skill in database audit and control
 - a. Demonstrate the ability to perform risk assessment, and design and implement internal controls to secure a database and the data within it. (LO 3.1; LO 4.1)

Some *specific skills/knowledge* students will acquire:

- Analyze a business environment and create data requirements
- Create a data model using the entity relationship diagramming technique notation
- Translate ER diagrams into normalized tables
- Create tables and queries using SQL
- Understand the auditing features of enterprise level database management systems
- Understand how to enforce data integrity in a database environment
- Understand the basics of REA data modeling
- Perform a risk assessment and design internal controls for database and data for a given business/organizational environment
- Understand the basics of XBRL and how to create simple XBRL financial statements

Course Materials

Lecture Slides & Additional Readings

- Lecture slides and additional readings will be available online through PolyLearn

Courseware

- MS Visio and MS Access will be required for some exercises/assignments. These programs will be available on the classroom workstations. Students may also install this software on their personal laptops (available via the College's MS DreamSpark subscription). You may borrow installation CDs from the Computer Lab (Room 301). (Mac users will need to set up a Windows domain on their machine using Boot Camp to install the software.)

Optional References:

- AIS Topics: Subject material for specific accounting information system topics covered in the course will be provided by the professor in lecture slides, readings, etc. Students who prefer a textbook format for more detailed descriptions and additional examples may want to consider purchasing this optional book: *Accounting Information Systems*, 13th Edition, by Romney & Steinbart, Pearson, 2014. ISBN-10: 0133428532; ISBN-13: 978-0133428537. (Companion website with Student Resources for the text: http://wps.pearsoned.com/bp_romney_ais_13/)
- Database Topics: Material for data modeling, database design and SQL will be in lecture slides and other resources provided by the professor. Additional material on these topics can also be found online. Students who prefer a textbook format for more detailed descriptions and additional examples may want to consider purchasing this optional book (any edition will have the core topics covered in the course): *Modern Database Management* by Hoffer et al. (Prentice Hall). Used older editions are often available for the cost of shipping.

Evaluation & Grading

	%	Points	
Exam 1 (<i>Topics from Classes #1-#6</i>)	22 %	110	
Exam 2 (<i>SQL – Classes #7-#12</i>)	22 %	110	
Final Exam (<i>Topics from Classes #13-21 + Selected topics from earlier classes</i>)	24 %	120	
Team Project – Audit Database Design and Implementation	20 %	100	4 students/team; students form teams of their choosing; all students on a team will receive the same grade for the project.
Homework Exercises (<i>Note: You may work on exercises individually or with other students.</i>)	12 %	60	There will be 13 homework exercises. Each exercise counts 5 points for completing the exercise, to a maximum of 60 points total. <i>In other words, you may skip one exercise without a penalty.</i>
Total	100%	500	

Final Grade

The final course grade will be based on performance on exams and the team project, and completion of homework exercises (based on the weights indicated). Final grades will be based on the following distribution:

A: 94 - 100	B+: 87 – 89	C+: 77 – 79	D+: 67 – 69	F: Below 60
A-: 90-93	B: 83 – 86	C: 73 – 76	D: 60 – 66	
	B-: 80 – 82	C-: 70 – 72		

The following is a description of letter grades and their significance that will be applied in this course:

- A:** Outstanding (student's performance is genuinely excellent)
- B:** Very Good (student's performance is clearly commendable but not necessarily outstanding)
- C:** Good (student's performance meets every course requirement and is acceptable or good, though not distinguished)
- D:** Below Average (student's performance fails to meet course objectives and standards)
- F:** Failure (student's performance is unacceptable)

Course Policies

Attendance Policy

You are expected to attend every class, on time. No absences of any nature will be construed as relieving you from the responsibility for the completion of all work assigned. If a class is missed it is the student's responsibility to obtain assignments, handouts, class notes, etc. (class notes should be obtained from fellow students).

Unexcused absences from exams will result in a score of zero for that test. Make-up exams will not be issued (the exception is for an extreme, verifiable emergency). The exam must be taken on the assigned day at the assigned time. Absolutely no exceptions.

Classroom Conduct

You are expected to be punctual and prepared for every class. You will be considerate of other students and the instructor, which includes not speaking when someone else (another student or the instructor) is speaking to the class.

Cell Phones

You may not use your cell phone in class. This goes for texting as well.

Computer Use

During class you are to use the computers **ONLY** for the material being covered in class.

Ethics/Academic Honor Code

By accepting admission to Cal Poly, you made a commitment to understand, support, and abide by the university's honor code and the student computing policy without compromise or exception. Any and all violations of this code will immediately be sent to the judicial board. Any plagiarism or cheating will result in an automatic failure (F) for the course.

Grading

If a mistake in grading occurs you must see me about it immediately. For ALL graded assignments, including exams, you have ONE WEEK after the grades are distributed to discuss grading issues with me. If you do not address these issues within ONE WEEK of receiving the grade, there will be no modifications to the grade, even if it works in your favor.

Policy – Late Assignments

All assignments (homework exercises and team project deliverables) are due at the beginning of class on the due date. Late assignments (i.e., assignments not submitted by the beginning of class on the due date) will receive a zero.

Students with Disabilities

Students with disabilities are encouraged to contact the instructor during office hours to discuss their disability-related needs. Use of Disability Resource Center services, including testing accommodations, requires prior authorization by the DRC and compliance with approved procedures.

Class Schedule

<i>Date</i>	<i>Topics</i>	<i>Readings/ Assignments Due</i>	<i>Applied & Hands-On Activities</i>
Class #1: Tues., Sept. 22	Course Overview Introduction to Databases – DB Environment, History and Trends, Database Development Process	Readings: • Syllabus • Browse <i>any one</i> of the following (available in PolyLearn) • “A Brief History of Databases” (Fortune, 2014) (available at http://avant.org/media/history-of-databases) • “Early History of SQL” – (Chamberlin, 2012) • “IBM Relational Database Systems: The Early Years” (Wade & Chamberlin, 2012)	
Class #2: Thurs., Sept. 24	The Relational Data Model Introduction to Entity- Relationship Modeling	Readings (available in PolyLearn): • Romney & Steinbart: pp. 82-93; and 502-505 Assignment: • Complete the Student Information Form (<i>link in PolyLearn</i>)	E-R Modeling Practice Problems Begin Exercise #1 ER Modeling (as time allows)
Class #3: Tues., Sept. 29	Assignment Requirements for Team Database Project Discussion – Data Breach Investigations Report Composite and Multi- valued Attributes on E-R Models The Enhanced E-R Model	Reading (available in PolyLearn): • 2015 Data Breach Investigations Report (Verizon): Read pp. 1-30 and be ready to report on one or more findings you found to be interesting/significant (especially from an auditor perspective). Assignment: • Exercise #1 - ER Modeling	Supertype/Subtype Modeling Practice Problem Begin Exercise #2 Supertype/Subtype Modeling (as time allows)
Class #4: Thurs., October 1	Discussion – Data Breach Investigations Report (cont'd) Transforming E-R Models to Relations	Readings: • 2015 Data Breach Investigations Report: Read pp. 31 – end of report and be ready to report on one or more incident classification patterns you would be concerned about from an auditor perspective. Assignment: • Exercise #2 - Supertype/Subtype Modeling • Team Membership Form (<i>link in PolyLearn</i>)	Drawing Basic ERDs with Visio 2013 Begin Exercise #3 ER-to- Relations Mapping Problem (as time allows)

<i>Date</i>	<i>Topics</i>	<i>Readings/ Assignments Due</i>	<i>Applied & Hands-On Activities</i>
<i>Class #5: Tues., Oct. 6</i>	<p>Best Practices for Database Security & Hardening the Database</p> <p>Physical Database Design/Field-Level Input Controls</p>	<p>Readings:</p> <ul style="list-style-type: none"> • Romney & Steinbart –Input Controls, pp. 287-289 • Notes on Data Types, Input Masks and Validation Rules in Access 2013 (<i>browse</i>) <p>Assignment:</p> <ul style="list-style-type: none"> • Exercise #3 – ER-to-Relations Mapping 	Begin Exercise #4 Data Dictionary/Access 2013 Input Controls (<i>as time allows</i>)
<i>Class #6: Thurs., Oct. 8</i>	<p>Database Account Security & User Authentication</p> <p>CPA Exam Practice Questions – Languages & Software Terms</p>	<p>Readings (<i>available in PolyLearn</i>):</p> <ul style="list-style-type: none"> • (<i>browse</i>) “The New Paradigm: When Authentication Becomes Invisible to the User” (Nagisetty & Booth, 2014) <p>View online tutorials - (links in PolyLearn):</p> <ul style="list-style-type: none"> - Access Basics, Part 1: Design and build tables for a database (15 minutes) - Access Basics, Part 2: Create table relationships (9 minutes) <p>Assignment:</p> <ul style="list-style-type: none"> • Exercise #4 – Data Dictionary/Input Controls 	Exercise #5 Access 2013 Database Build (<i>as time allows</i>)
<i>Class #7: Tues., Oct. 13</i>	EXAM 1	<p>Assignment:</p> <ul style="list-style-type: none"> • Exercise #5 – Access 2013 Database Build 	
<i>Class #8: Thurs., Oct. 15</i>	<p>Database Design Walkthroughs</p> <p>(15 minute team meetings with the professor)</p>	<p>Assignment:</p> <ul style="list-style-type: none"> • (<i>team</i>) Draft ER Diagram for Audit Database Project (<i>bring a printout to the meeting</i>) 	
<i>Class #9: Tues., Oct. 20</i>	Introduction to SQL	Readings: <i>none</i>	<p>SQL Practice Problems</p> <p>Begin Exercise #6 Single-Table Queries (<i>as time allows</i>)</p>
<i>Class #10: Thurs., Oct. 22</i>	<p>SQL – Aggregate Functions, GROUP BY, HAVING</p> <p>SQL – Table JOINS</p>	<p>Readings: <i>none</i></p> <p>Assignments:</p> <p>Exercise #6 – SQL Queries – Single Table</p>	Begin Exercise #7 Aggregate Functions, GROUP BY, HAVING and JOINS (<i>as time allows</i>)
<i>Class #11: Tues., Oct. 27</i>	<p>SQL – Relational Set Operators, Parameter Queries, Stored Procedures/Triggers</p> <p>SQL - Subqueries and Correlated Queries</p>	<p>Readings: <i>none</i></p> <p>Assignment:</p> <p>Exercise #7 Aggregate Functions, GROUP BY, HAVING and JOINS</p>	Begin Exercise #8 Relational Set Operators and Subqueries (<i>as time allows</i>)

<i>Date</i>	<i>Topics</i>	<i>Readings/ Assignments Due</i>	<i>Applied & Hands-On Activities</i>
Class #12: Thurs., Oct. 29	SQL Injection Using the Query Wizard in Access SQL “Mini Review” Quiz	Readings: <i>none</i> Assignment: Exercise #8 Relational Set Operators and Subqueries	Access Query Wizard Exercises (<i>in-class; not to turn in</i>)
Class #13: Tues., Nov. 3	EXAM 2 - SQL		
Class #14: Thurs., Nov. 5	Database Design Using the REA Data Model CPA Exam Practice Questions – Hardware Terminology	Readings: <i>none</i> Assignment: • (<i>team</i>) Database Project Final Submission – Database and ERD files and print-out of Project Report	Begin Exercise #9 REA Modeling (<i>as time allows</i>)
Class #15: Tues., Nov. 10	Special Topics in REA Modeling Integrating REA Diagrams and Generating Financial Statements Database Privileges & Authorization	Readings: <i>none</i> Assignment: • Exercise #9 – REA Modeling	Begin Exercise #10 Integrating REA Models (<i>as time allows</i>)
Class #16: Thurs., Nov. 12	Distributed Database Concepts CPA Exam Practice Questions – Networks	Readings: <i>none</i> Assignment: • Exercise #10 Integrating REA Models	Begin Exercise #11 Distributed Database Concepts (<i>as time allows</i>)
Class #17: Tues., Nov. 17	Data/System Availability, Disaster Recovery & Business Continuity Discussion – Northrop Grumman Case CPA Exam Practice Questions – Disaster Recovery/Business Continuity	Readings: • “Information Systems at Northrop Grumman Ship Systems Sector: The Hurricane Katrina Recovery” (Ives and Junglas, 2006) (<i>Be prepared to discuss the questions posted in PolyLearn.</i>) Assignment: • Exercise #11 Distributed Database Concepts	
Class #18: Thurs., Nov. 19	Introduction to XBRL CPA Exam Practice Questions – Database and Password Security	Readings (<i>posted in PolyLearn</i>): • “A Tour of Five XBRL Tools” (Wenger, 2013) • “XBRL Filing Frustrations Tilting Toward Resolution” (White, 2015) • “XBRL and Auditing” (Brands, 2013)	Begin Exercise #12 SEC Filings XBRL Instance Documents (<i>as time allows</i>)

<i>Date</i>	<i>Topics</i>	<i>Readings/ Assignments Due</i>	<i>Applied & Hands-On Activities</i>
Class #19: Tues., Nov. 24	*** NO CLASS MEETING TODAY- SELF-STUDY ONLY ***	<p>Students are responsible for completing the following (<i>all material posted in Poly Learn</i>):</p> <ul style="list-style-type: none"> • Review slides/slide notes: “Control and Accounting Information Systems: Overviews of COBIT and COSO” • <i>Browse the white paper</i>: “Relating the COSO Internal Control Integrated Framework and COBIT” (ISACA, 2014) • Read the Example Application of COBIT for Privacy & Confidentiality (URL in PolyLearn) • Consider the 4 example scenarios at the end of the slides and make note of your answers/recommendations – Will be discussed at the next class session. (No need to turn anything in.) 	
Thurs., Nov. 26	*** Thanksgiving Holiday – NO CLASS ***		
Class #20: Tues., Dec. 1	<p>Discussion of Internal Control Scenarios - Mini Cases</p> <p>Confidentiality & Privacy Controls</p> <p>Encryption – Data-in-Transit & Data-at-Rest</p>	<p>Readings: <i>none</i></p> <p>Assignment:</p> <ul style="list-style-type: none"> • Exercise #12 SEC Filings XBRL Instance Documents 	
Class #21: Thurs., Dec. 3	Course Wrap-Up – Review, Reflection, Feedback	Assignment: Exercise #13 Reflections on Digital Privacy	
Tuesday, Dec. 8 4:10 – 7:00 p.m.	*** FINAL EXAM ***		

(This Syllabus Provides a General Plan for the Course; Deviations May Be Necessary.)