American Public University System
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INFO222

Course Summary

Course : INFO222 **Title :** Database Management Systems
Length of Course : 8 **Faculty :**
Prerequisites : N/A **Credit Hours :** 3

Description

Course Description:

This course is a study of major advancements in database technology that have taken place in recent years. It does not assume any prior background in the field of databases, and, hence, starts with basic introduction concepts, but covers advanced topics as well. The course will cover both conceptual and hands-on material in the area of database management, thus enabling students to have the maximum amount of comprehension and retention of material covered in the course.

Course Scope:

This Database Management Systems course is designed to provide students with a thorough knowledge of the concepts to develop a business application. INFO222 begins with the introduction to concepts highlighting key advantages and disadvantages of database systems. A foundation of any database is the ability to extract relevant information. The course will provide an examination of relational databases and demonstrate the querying functions to successfully extract the data. In addition, successful completion of the course will enable students to analyze database requirements and design a working application for use in business operations. You will describe the methodology used to develop the application and the planning involved in the construction of the database. A clear and concise understanding of database management system concepts will be obtained from weekly exercises from the chapter review questions, periodic threaded discussions, case study analysis, and exercises. The course concludes with the student demonstrating an understanding of the concepts by developing a database.

Note to Students: The Resources, assignments, learning outcomes, and expectations in this upper level undergraduate course assume that the student has completed all lower level general education and career planning coursework necessary to develop research, writing, and critical thinking skills. Students who have not fulfilled all general education requirements through courses or awarded transfer credit should strongly consider completing these requirements prior to registering for this course.)
This course has been evaluated by the American Council on Education. Credit Recommendation - at the upper level/baccalaureate degree level 3 semester hours in Management Information Systems.

Objectives

The successful student will fulfill the following learning objectives:

1. Describe the evolution of relational databases as a tool for information management.
2. Assess the key components of a database management system.
3. Assess the process and methodologies for designing databases.
4. Explain the functions of database administration.
5. Examine the rudiments of the Structured Query Language (SQL).
6. Evaluate database table normalization.
7. Evaluate the data integrity, security, and availability issues related to relational databases.
8. Design a database management system with the skills gained from this course.

Outline

Week 1: Discussion Personal Introduction, Introduction to Database Management

Learning Objective(s)

CO1

Introduce basic database terminology. Describe database management systems. Describe the characteristics of a DBMS. Describe the importance of ACID model. Explain the advantages and disadvantages of database processing

Reading(s)

Relational Database Design and Implementation, 4th Edition

Chapter 1 – The Database Environment

Using SQLite

Chapter 1 – What is SQLite

Week1 Web Readings. See Resources section of syllabus.

Assignment(s)

Provide personal introduction in the Discussion.

Review the weekly terms from the announcements.

Review the corresponding PowerPoint lecture in the Resources section of the classroom.

Review Discussion Question(s) in the weekly discussion discussion and participate accordingly. Weekly post by Wednesday, and 2 peer review postings

Complete the Week 1 Database Exercise (in the Assignments section)

Week 2: Database Architectures

Learning Objective(s)

CO2

Describe the relational model.
Explain the concepts of relational algebra.

Reading(s)

Relational Database Design and Implementation, 4th Edition
Chapter 5 – The Relational Database Model
Chapter 6 – Relational Algebra (only section The Relational Algebra and SQL Example Database: Rare Books)

Using SQLite

Chapter 4 – The SQL Language

Week2 Web Readings. See Resources section of syllabus.

Assignment(s)

Review the weekly terms from the announcements.

Review the corresponding PowerPoint lecture in the Resources section of the classroom.

Review Discussion Question(s) in the weekly discussion and participate accordingly. Weekly post by Wednesday, and 2 peer review postings

Complete the Week 2 Database Exercise (in the Assignments section)

Week 3: Managing, Retrieving and Manipulating Data

Learning Objective(s)

CO3

Assess the term SQL.

Define the simple and compound conditions of SQL.

Explain and demonstrate the functions of SQL.

Use SQL to update an existing and create a table in the database.

Reading(s)

Relational Database Design and Implementation, 4th Edition
Chapter 10 - Introduction to SQL

Using SQLite

Chapter 5 – The Select Commad

Week3 Web Readings. See Resources section of syllabus.

Assignment(s)

Review the weekly terms from the announcements.

Review the corresponding PowerPoint lecture in the Resources section of the classroom.

Review Discussion Question(s) in the weekly discussion and participate accordingly. Weekly post by Wednesday, and 2 peer review postings

Complete the Week 3 Database Exercise (in the Assignments section)

Week 4: Managing, Retrieving and Manipulating Data Continued

Learning Objective(s)

CO4

Assess and describe the use of views.

Use indexes to improve database performance.

Examine the security features of a DBMS.

Examine entity, referential, and legal-values integrity.

Demonstrate changing the structure of a relational database.

Assess and use the system catalog.

Reading(s)
Relational Database Design and Implementation, 4th Edition
Chapter 8 – Database Design and Performance Tuning
Chapter 20 – Data Modification (read only Inserting Rows, Updating Data, Deleting Rows)

Week4 Web Readings. See Resources section of syllabus.

Assignment(s)

Review the weekly terms from the announcements.

Review the corresponding PowerPoint lecture in the Resources section of the classroom.

Review Discussion Question(s) in the weekly discussion and participate accordingly. Weekly post by

Wednesday, and 2 peer review postings

Complete the Week 4 Database Exercise (in the Assignments section).
AND
Complete online quiz - week 4.

Week 5: Database Analysis

Learning Objective(s)

CO5

Examine functional dependence.

Examine first normal form, second normal form, and third normal form.

Describe the problems associated with tables not in first, second or third normal form, along with mechanism for converting to all three.

Examine the problems associated with incorrect conversions to third normal form.

Examine fourth normal form.

Reading(s)

Relational Database Design and Implementation, 4th Edition
Chapter 4 – Entities and Relationships
Chapter 7 – Normalization (read only Translation an ER Diagram into Relations)

Using SQLite

Chapter 6 – Database Design

Week5 Web Readings. See Resources section of syllabus.

Assignment(s)

Review the weekly terms from the announcements.

Review the corresponding PowerPoint lecture in the Resources section of the classroom.

Review Discussion Question(s) in the weekly discussion and participate accordingly. Weekly post by

Wednesday, and 2 peer review postings

Complete the Week 5 Database Exercise (in the Assignments section)

Week 6: Normalization

Learning Objective(s)

CO6

Examine functional dependence.

Examine first normal form, second normal form, and third normal form.

Describe the problems associated with tables not in first, second or third normal form, along with mechanism for converting to all three.

Examine the problems associated with incorrect conversions to third normal form.

Examine fourth normal form.

Reading(s)

Relational Database Design and Implementation, 4th Edition
Chapter 7 – Normalization (read Normal Forms, First Normal Form, Second Normal Form, Third Normal Form)

Week6 Web Readings. See Resources section of syllabus.

Assignment(s)

Review the weekly terms from the announcements.

Review the corresponding PowerPoint lecture in the Resources section of the classroom.

Review Discussion Question(s) in the weekly discussion and participate accordingly. Weekly post by Wednesday, and 2 peer review postings

Complete the Week 6 Database Exercise (in the Assignments section)

Week 7: Database Design Methodology

Learning Objective(s)

CO7

Define and explain the function provided by a DBMS.

Describe how a DBMS handles updating and retrieving data.

Examine the catalog feature of a DBMS.

Illustrate the concurrent update problem and describe how a DBMS resolves the issue.

Explain the data recovery process in a database.

Describe the security features of a DBMS.

Examine the data integrity feature provided by a DBMS.

Describe data independence within a DBMS

Define and describe data replication.

Reading(s)

Relational Database Design and Implementation, 4th Edition
Chapter 2 – Systems Analysis and Database Requirements
Chapter 3 – Why Good Design Matters

Week7 Web Readings. See Resources section of syllabus.

Assignment(s)

Review the weekly terms from the announcements.

Review the corresponding PowerPoint lecture in the Resources section of the classroom.

Review Discussion Question(s) in the weekly discussion and participate accordingly. Weekly post by Wednesday, and 2 peer review postings

Complete the Week 7 Database Exercise (in the Assignments section)
AND
Complete online quiz - week 7

Week 8: Database Methodology, Data Security, Recovery, and Support

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Learning Objective(s)

CO7 – cont…

Explain the need for database administration

Describe database access privileges.

Examine issue pertaining to database security and disaster planning.

Examine database dictionary management

Examine database testing and performance issues

Reading(s)

Relational Database Design and Implementation, 4th Edition
Chapter 23 – Database Security

Week8 Web Readings. See Resources section of syllabus.

Assignment(s)

Review the weekly terms from the announcements.

Review the corresponding PowerPoint lecture in the Resources section of the classroom.

Review Discussion Question(s) in the weekly discussion and participate accordingly. Weekly post by Wednesday, and 2 peer review postings

Complete the Week 8 Term Project– see the Term Project description for details.

Evaluation

The grading will be based on eight weekly Discussions, seven graded assignments, a Term Project, and two open book Quizzes.

1. There will be **seven assignments (5-7% each) counting a total of 41% of the final grade**. The assignments will follow each of the major milestones of the course. These assignments will be problems or questions from the text or based on material in the text. They are a combination of Lesson Reviews and Lesson Activities and/or Labs. They are selected to provide the student with information to understand the concepts discussed. Assignments should be prepared in Microsoft Word (or a Word compatible product) and uploaded into the student assignment folder by the due date. Assignments also may include work in MS Access and uploading of the Access file in the assignment area.
2. There will be **eight weekly Discussion postings you will need to respond to**. Answers should be 3- 4 paragraphs with a **topic sentence** that **restates the question** and **supporting sentences** using the terms, concepts, and theories from the required readings. You may **critique**, **support** or **supplement** other students' answers using the terms, concepts and theories from the required readings. All responses should be a **courteous paragraph** that contains a **topic sentence** with good **supporting sentences**. You may respond multiple times with a continuous discussion with points and counter points. The key requirement is to express your idea and then **support your position** using the terms, concepts and theories from the required readings to demonstrate to me that you understand the material. The Discussion postings will count as 32% (4% for each discussion posting) of the final grade. In an online environment communication and exchange of ideas is critical. These Discussion postings allow us the opportunity to discuss trends in the technology we are studying, future possibilities, updates and above all, allow us an opportunity to get to know each other and work as a group. This can only happen, when students and instructors work together. It is not out of the ordinary when students participate in a "hot" discussion and the exchange of ideas and arguments is achieved. Discussion submissions are due by Wednesday of

each week, in order to give other students the opportunity to read your post and respond.

Instructions to review and submit Discussion input:

1. Log into the classroom
2. Select the "Discussion" link
3. Select the appropriate Discussion under the column labeled "Group Name"
4. Choose a specific thread to see all the messages and choose a specific message to reply.
5. Select on the "reply to this message" link.
6. Provide your input.
7. Select the "submit" button.

Discussion Grading Rubric

Your post should add value to the classroom discussions to be counted for participation. It can be a new analogy, scenario, case study, different viewpoint or even a good question.
The Discussion grading rubric can be found in the Discussion instructions.

1. There will be **a Term Project (17%)** due the 8th week
2. There will be **two** non-proctored **quizzes (5% each)** in week 4 and week 7 which count as **10%** of the final grade. The quizzes are multiple-choice selections and will be open book and open note.

Due Dates

All assignments, Discussion Peer Reviews, quizzes, tests, papers, projects are due Sunday of each week by 11:59:00 PM (Discussion Initial posts are due on Wednesday 11:59:00 PM). **Discussion posts must be made by Sunday of the week they are due – posts will not be accepted after that date for grading – without prior approval. The Weekly assignments and Term Project may be submitted once for grading –double check you have included all the required attachments before finalizing a submission.**

Announcements

In the announcement area there will be an overview of the information for the week, a summary of the assignments, and key terms enabling focused studying of concepts from the readings. These key terms will be used as the basis for the mid-term and final exams. This information will be located in the announcements section of the online classroom.

Lecture

Each week, students will review the power point lecture located in the Resources section of the online classroom.

Term Project and Proposal (17%)

The Term project is a database design exercise.

The term project will complete the database design (functional dependencies / normalization) – only the tables are designed - there is no expectation of designing an overall application. The detailed instructions can be found in the online assignment box (at the time of release).

Quiz Completion Procedures

1. Log into the classroom
2. Select the "exams" link
3. Select the "INFO321 Quiz week4" or "INFO321 quiz week 7" link.

Submission of Written Assignments

Although distance learning provides an optimal amount of flexibility, students are expected to follow the

syllabus expectations and schedule.

NOTE: Submitted assignments are time stamped using east coast time. This time stamp is my verification of an on time submittal. If you live in another time-zone, keep this in mind when submit assignments. Use the time-zone converter at this link to help you submit assignments in a timely manner.

Written assignments – Term project/PPE/Database exercise submission instructions:

1. Log into the classroom.
2. Select the "assignments" link.
3. Select the corresponding assignment (i.e. INFO321 Week 1 Assignment).
4. Upload file to the assignment. Ensure the file is a MS Word document.
5. Check the box "submit for grading."
6. Select the "submit" button.

LATE ASSIGNMENTS

Students are expected to submit classroom assignments by the posted due date and to complete the course according to the published class schedule. As adults, students, and working professionals I expect you to manage competing demands on your time. Should you need additional time to complete an assignment contact me before the due date so we can discuss the situation and determine an acceptable resolution. Routine submission of late assignments is unacceptable and may result in points deducted from your "final course grade". Bulk uploading of late assignments is not acceptable.

Without prior agreement, 2% points per day will be deducted from "Assignments" that are submitted after the due date. *Submissions that are made more than 1 week after the due date may not be accepted for grading – all assignments must be submitted by the last day of class.*

ALL "Discussion" postings must be made on time. Students are expected to contact me prior to a Discussion due date to request additional time. **Discussion posts made after the weekly due date will not be accepted for grading without prior approval.**

No submissions will be accepted for grading after the last day of the course.

Requests for an extension to a due date must be accompanied with a justification and a plan to complete each outstanding assignment. The extension may or may not be granted. Ensure you use the APUS formal course extension process – these requests must be made prior to the last day of class.

Course extensions do not reset the due dates for Assignments or Discussions that were due prior to the course extension request.

DISCLAIMER STATEMENT Course content may vary from the outline to meet the needs of this particular group.

Grading:

Name	Grade %
Discussions	32.00 %
Discussion 1	8.00 %
Discussion 2	8.00 %
Discussion 4	8.00 %
Discussion 6	8.00 %

Exercise 1 - 4	20.00 %
Week1 Database Exercise	5.00 %
Week2 Database Exercise	5.00 %
Week3 Database Exercise	5.00 %
Week4 Database Exercise	5.00 %
Exercise 5 - 7	21.00 %
Week5 Database Exercise	7.00 %
Week6 Database Exercise	7.00 %
Week7 Database Exercise	7.00 %
Term Project	17.00 %
Week8 Term Project	17.00 %
Quizzes	10.00 %
Quiz week 7	5.00 %
Quiz week 4	5.00 %

Materials

Book Title: Students must have access to the required software. APUS does not supply this software. The listing can be found at APUS Online Library

Author: No Author Specified

Publication Info:

ISBN: N/A

Book Title: Database Systems: A Practical Approach to Design, Implementation, and Management, 6th ed - the VitalSource e-book is provided inside the classroom

Author: Connolly, Thomas ; Carolyn Begg

Publication Info: VS-Pearson

ISBN: 9781269886628

Book Title: Illustrated Microsoft Office 365 & Access 2016: Comprehensive, 1st ed - the VitalSource e-book is provided inside the classroom

Author: Lisa Friedrichsen

Publication Info: VS-Cengage

ISBN: 9781305878006

Optional Text

Publication manual of the American Psychological Association (6th ed.). (2010). Washington, D.C.: American Psychological Association.

Web-based Readings (Optional)

- ***Week1***
  - Chaterjee, J. (2005). Introduction to RDBMS, OODBMS and ORDBMS. Retrieved November 1, 2007 from http://www.aspfree.com/c/a/Database/Introduction-to-RDBMS-OODBMS-and-

ORDBMS/

- ***Week2***
  - RDBMS Tutorial.
- ***Week3***
  - Interactive Online SQL Training. (n.d.) Retrieved November 1, 2007 from
- ***Week4***
  - Microsoft Access 2010 Query Tutorial (n.d.). Retrieved January 19, 2010 from http://office.microsoft.com/en-us/access-help/create-queries-for-a-new-database-RZ101772999.aspx
- ***Week5***
  - Litt, S. (1996). Normalization. Retrieved July 31, 2004 from
- ***Week6***
  - The Relational Model (n.d). Retrieved November 2, 2007 from http://www.tometasoftware.com/files/relational_model_revised.pdf
- ***Week7***
  - Chappell, M. (n.d.). *Choosing a Database for Your Organization*. Retrieved November 3, 2007 from
- ***Week8***
  - Chappel, M. (n.d.). Password Protect an Access Database . Retrieved November 3, 2007 from
  - Mullins, C. (2002). *What is a DBA?* Retrieved November 2, 2007 from http://www.dbazine.com/ofinterest/oi-articles/dba-1

Software Requirements

- MS Word or any word processor with the ability to export a *.txt file.
- MS Access Availability
- Adobe Acrobat Reader (Select this for free download)

Selected Bibliography

Begg, C., Connolly, T., & Strachan, A. (2004). *Database Systems: A Practical Approach to Design, Implementation and Management*. Boston, MA: Addison-Wesley

Chen, P. (n.d). *Entity-Relationship Modeling: Historical Events, Future Trends, and Lessons Learned.* Retrieved 2 November, 2007

Date, C. (2000). *The Database Relational Model: A Retrospective Reviewand Analysis : A Historical Account and Assessment of E. F. Codd's Contribution to the Field of Database Technology*. Boston, MA: Addison Wesley

Date, C. (2005). *Databases in Depth*. Sebastopol, CA: O'Reilly Publishing

Gennick, J. (2004). *SQL Pocket Guide.* Sebastopol, CA: O'Reilly Publishing

Henderson, M. (2003). *Database Design for Mere Mortals.* Boston, MA: Addison-Wesley Professional

Keogh, J. and Davidson, K. (2004). *Data Structures Demystified*. New York, NY: McGraw-Hill Osborne

Kroenke, D. (2004). *Database Concepts.* Upper Saddle River, NJ: Prentice Hall

Oppel, A. (2004). *Databases Demystified.* New York, NY: McGraw-Hill Osborne

Petersen, J. (2002). *Absolute Beginner's Guide to Databases.* Indianapolis, IN: Que

Riordan, R. (2005). *Designing Effective Database Systems.* Boston, MA: Addison-Wesley

Course Guidelines

Citation and Reference Style

- Attention Please: Students will follow the APA Format as the sole citation and reference style used in written work submitted as part of coursework to the University. Assignments completed in a narrative essay or composition format must follow the citation style cited in the APA Format.

Tutoring

- Tutor.com offers online homework help and learning resources by connecting students to certified tutors for one-on-one help. AMU and APU students are eligible for 10 free hours* of tutoring provided by APUS. Tutors are available 24/7 unless otherwise noted. Tutor.com also has a SkillCenter Resource Library offering educational resources, worksheets, videos, websites and career help. Accessing these resources does not count against tutoring hours and is also available 24/7. Please visit the APUS Library and search for 'Tutor' to create an account.

Late Assignments

- Students are expected to submit classroom assignments by the posted due date and to complete the course according to the published class schedule. The due date for each assignment is listed under each Assignment.
- Generally speaking, late work may result in a deduction up to 15% of the grade for each day late, not to exceed 5 days.
- As a working adult I know your time is limited and often out of your control. Faculty may be more flexible if they know ahead of time of any potential late assignments.

Turn It In

- Faculty may require assignments be submitted to Turnitin.com. Turnitin.com will analyze a paper and report instances of potential plagiarism for the student to edit before submitting it for a grade. In some cases professors may require students to use Turnitin.com. This is automatically processed through the Assignments area of the course.

Academic Dishonesty

- Academic Dishonesty incorporates more than plagiarism, which is using the work of others without citation. Academic dishonesty includes any use of content purchased or retrieved from web services such as CourseHero.com. Additionally, allowing your work to be placed on such web services is academic dishonesty, as it is enabling the dishonesty of others. The copy and pasting of content from any web page, without citation as a direct quote, is academic dishonesty. When in doubt, do not copy/paste, and always cite.

Submission Guidelines

- Some assignments may have very specific requirements for formatting (such as font, margins, etc) and submission file type (such as .docx, .pdf, etc) See the assignment instructions for details. In general, standard file types such as those associated with Microsoft Office are preferred, unless otherwise specified.

Disclaimer Statement

- Course content may vary from the outline to meet the needs of this particular group.

Communicating on the Discussion

- Discussions are the heart of the interaction in this course. The more engaged and lively the exchanges,

the

more interesting and fun the course will be. Only substantive comments will receive credit. Although there is a final posting time after which the instructor will grade comments, it is not sufficient to wait until the last day to contribute your comments/questions on the discussion. The purpose of the discussions is to actively participate in an on-going discussion about the assigned content.

- "Substantive" means comments that contribute something new and hopefully important to the discussion. Thus a message that simply says "I agree" is not substantive. A substantive comment contributes a new idea or perspective, a good follow-up question to a point made, offers a response to a question, provides an example or illustration of a key point, points out an inconsistency in an argument, etc.
- As a class, if we run into conflicting view points, we must respect each individual's own opinion. Hateful and hurtful comments towards other individuals, students, groups, peoples, and/or societies will not be tolerated.

Identity Verification & Live Proctoring

- Faculty may require students to provide proof of identity when submitting assignments or completing assessments in this course. Verification may be in the form of a photograph and/or video of the student's face together with a valid photo ID, depending on the assignment format.
- Faculty may require live proctoring when completing assessments in this course. Proctoring may include identity verification and continuous monitoring of the student by webcam and microphone during testing.

University Policies

Student Handbook

- Drop/Withdrawal policy
- Extension Requests
- Academic Probation
- Appeals
- Disability Accommodations

The mission of American Public University System is to provide high quality higher education with emphasis on educating the nation's military and public service communities by offering respected, relevant, accessible, affordable, and student-focused online programs that prepare students for service and leadership in a diverse, global society.