Atlantic Cape Community College
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# CISM170 Database Design Using Oracle

Course Syllabus

**Description:**  This course is designed for an introductory course in database management and database development. The course will include the following topics:  the role of databases and their development in organizations, data modeling and data design using ERD and Oracle SQL, Client/Server environment, Internet Database environment, data warehousing, database administration, Object-Oriented data modeling, and Object-Oriented database development.

**Prerequisite:** *CISM 125*

**Required Text:**
- Text Book: Coronel, C., Morris, S. (2017). *Database Systems: Design, Implementation, and Management* (12th ed.). Boston, MA: Cengage. ISBN: 978-1-305-62748-2 (hardback), 978-1-305-86679-9 (loose Leaf).

**ISAS Academic Honesty Policy**

Academic honesty is essential to the trust that is fundamental to an educational experience. Academically dishonest behaviors will not be tolerated. Examples include, but are not limited to, software piracy, computer vandalism, cheating, fabrication, plagiarism, copying, and facilitating academic dishonesty. Any academic dishonesty will be reported to the chairperson of the CISM department, Dean of Instruction, and Dean of Students. Penalties may result in "F" or "0" for the assignment or "F" for the course. Two such offenses will be grounds for academic dismissal. See Student Handbook for more information.

**STUDENTS REQUIRING DISABILITY SUPPORT SERVICES**

As per the Americans with Disabilities Act (ADA), reasonable accommodations can be provided to students who present documentation of a disability to Atlantic Cape Community College's Center for Accessibility, located on the first floor of "J" Building in the Counseling and Support Services department (Mays Landing campus). Reasonable accommodations cannot be provided for a course until the student registers with the Center for Accessibility. For more information, please contact the Center for Accessibility via email at cfa@atlantic.edu or call 609-343-5680.

**COURSE EVALUATION**

|  | Percent |
|---|---|
| Quizzes | 25% |
| Tests | 25% |
| Discussions | 10% |
| Assignments | 40% |
| **Total** | **100%** |

September 2, 2019

**PERCENTAGE GRADING SCALE:**

| Grade | Percentage Range | Grade Point Value |
|-------|------------------|-------------------|
| A     | 93-100%          | 4.0               |
| A-    | 90-92%           | 3.7               |
| B+    | 87-89%           | 3.3               |
| B     | 83-86%           | 3.0               |
| B-    | 80-82%           | 2.7               |
| C+    | 77-79%           | 2.3               |
| C     | 70-76%           | 2.0               |
| D     | 60-69%           | 1.0               |
| F     | 0-59%            | 0.0               |

**Learning Objectives:**

1. Understand database concepts
   a. The difference between data and information
   b. Database's role in decision support
   c. Components of a database management system
   d. The functions of a database management system
2. Data Modeling
   a. What business rules are, and how they influence database design
   b. The basic structure and syntax of data modeling
   c. Classifying data models by their level of abstraction
3. The Relational Data Model
   a. Understand logic vs the relational model
   b. The basic component: relations.
   c. How to implement relations using a database management system
   d. Handling redundancy and indexing
4. Entity Relationship Modeling (E-R)
   a. Defining, refining and incorporating relationships into the database design process.
   b. Reconciling real-world needs against the relational model
5. Database Normalization
   a. What is normalization and the role it plays in the database design process
   b. Understand the normal forms (1NF, 2NF, 3NF).
   c. Using normalization with the E-R diagram
   d. When denormalization is appropriate
6. Structured Query Language
   a. The basic commands and functions of SQL
   b. Using SQL for data administration
   c. Using SQL for data manipulation
   d. Using SQL to extract information from a database
   e. Using SQL to combine multiple tables
   f. Using subqueries and correlated queries
   g. Using SQL functions to manipulate various data types
   h. Understand how to use set operators in SQL.
   i. Understand the application of triggers, stored procedures and user defined functions
7. Database Design
   a. Apply standard software development life-cycle techniques to the database design process
   b. Synthesize UML syntax with the various data modeling techniques used by database programmers.
8. Transaction Management & Concurrency Control
   a. Understand concurrency and transaction's role in data integrity
   b. Understand locking methods
   c. How stamping and optimistic methods are used for concurrency control
   d. How these techniques are used in database recovery
9. Database Performance Tuning & Query Optimization
   a. How a DBMS processes queries
   b. How indexes are used by the DBMS
   c. Optimization techniques used in SQL
10. Distributed Database Management Systems
    a. Understand the levels of data and process distribution
    b. Transaction management in a distributed environment
    c. Understand data partitioning
    d. Understand how distributed DBMS affect performance, scalability, and availability
11. Business Intelligence and Data Warehouses
    a. Know the history of business intelligence, its evolution and reporting styles
    b. Understand operational and decision data
    c. Preparing data for a data warehouse
    d. Understand how online analytical processing is used
12. Database Administration and Security
    a. The role of database's within organizations
    b. The DBA's role
    c. Information and data security
    d. DBA tools and strategies
    e. Administering cloud data services
    f. DBA tasks common in Oracle

**Intended Learning outcomes:**

1. Student will be able to differentiate between data and information
2. Student will be able to asses data needs, and model a database design
3. Student will be able to apply normalization to database design models
4. Student will be able to use the Structured Query Language (SQL) to implement a database design, and work affectively with data
5. Student will be able to administer and manage an Oracle database environment

**Outline:**

| Unit | Date | Lecture Topics | Readings | Assessments | | | | |
|------|------|----------------|----------|-------------|---|---|---|---|
| | | | | Case (25%) | Group (10%) | Practical (30%) | Quiz (5%) | Exam (30%) |
| 1 | 9/5 | Database Systems | Ch.1 | | | **PA-0** **PA-1.1** | **Q-1** | |
| 2 | 9/12 | Data Models | Ch.2 | | | **PA-2.1** **PA-2.2** | **Q-2** | |
| 3 | 9/19 | The Relational Model | Ch.3 | **CS-3.1** | | | **Q-3** | |
| 4 | 9/26 | E-R modeling | Ch.4 | | **GA-4.1** | **PA-4.1** | **Q-4** | |
| 5 | 10/3 | Normalization | Ch.6 | | | **PA-5.1** **PA-5.2** | **Q-5** | |
| 6 | 10/10 | SQL Intro | Ch.7 | **CS-6.1** | | | **Q-6** | |
| 7 | 10/17 | Advanced SQL | Ch.8 | **CS-7.1** | | | **Q-7** | |
| 8 | 10/24 | | | | | | | **Midterm** |
| 9 | 10/31 | Transaction Management | Ch.10 | | | **PA-9.1** | **Q-9** | |
| 10 | 11/7 | Performance Tuning & Optimization | Ch.11 | | | **PA-10.1** | **Q-11** | |
| 11 | 11/14 | Distributed Database Systems | Ch.12 | **CS-11.1** | | | **Q-12** | |
| 12 | 11/21 | Business Intelligence & Data Warehouses | Ch.13 | | | | **Q-13** | |
| 13 | 11/28 | Database Design using SDLC | Ch.9 | **CS-13.1** | | | **Q-14** | |
| 14 | 12/5 | Database Administration & Security | Ch.16 | | | | **Q-15** | |
| 15 | 12/12 | | | | | | | **Final** |

**Key:**

- **CS**-Case Study Project *(25%)*
- **PA**-Practical Assignment *(30%)*
- **GA-**Group Assignment *(10%)*
- **Q**-Quiz (Blackboard) *(5%)*

**Academic Honesty**

Atlantic Cape expects unwavering integrity in work submitted from students. Acts of cheating or plagiarism will not be tolerated. Students are expected to give credit to all individuals who contributed to the completion of a project or paper; to cite the specific source of all information, ideas and quotations not original to the author; to honestly follow procedures established by instructors for examinations, laboratory experiments, reports and projects.

**College Policies**

In order for students to know their rights and responsibilities, all students are expected to review and adhere to all regulations and policies as listed in the College Catalog and Handbook.  These documents can be accessed at **http://www.atlantic.edu/about/policy/**.  Important policies and regulations include but are not limited to the following:

- Student Code of Conduct
    - Including Academic Dishonesty/Plagiarism and Civility
- Attendance
- Grading Standards
- Use of Communication and Information Technology

**Disability Support Services**

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