BABCOCK UNIVERSITY



**SCHOOL:** COMPUTING AND ENGINEERING SCIENCES

**DEPARTMENT**: COMPUTER SCIENCE &SOFTWARE ENGINEERING

**SESSION/SEMESTER:** 2023/2024.1

**Course Title:** Database Design and Management

**Course Code:** COSC333/405/417

**Course Credit:** 3

**LECTURERS IN CHARGE**:

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# OUR VISION STATEMENT

A first-class Seventh-day Adventist institution, building servant leaders for a better world

# OUR MISSION STATEMENT

Building leadership through Christian education; transforming lives, impacting society for positive change.

To achieve our mission, we are committed to:

* Achieving excellence in our teaching, research program, and service delivery
* Imparting quality Christian education
* Instilling Christ-like character to the members of our community

# OUR CORE VALUES

* Excellence -Our Culture
* Integrity -Our Promise
* Accountability -Our Moral
* Servant Leadership -Our Strength
* Team Spirit -Our Dignity
* Autonomy and Responsibility -Our Passion
* Adventist Heritage -Our Commitment

# OUR PHILOSOPHY

Babcock University’s philosophy is anchored on the harmonious development of the intellectual, physical, social, and spiritual potentials of our students, inspiring stable and noble character needed for effective leadership and service in the society.

**CORPORATE IMAGE STATEMENT:** A center of excellence for character development and scholarship; a socially responsive, responsible, and accountable institution in matters of commitment and action.

**COURSE DESCRIPTION:** This course engages students to analyze complex business scenarios and create a data model—a conceptual representation of an organization’s information. Students implement their database design by creating a physical database using SQL. Basic SQL syntax and the rules for constructing valid SQL statements are reviewed. This course culminates with a project that challenges students to design, implement, and demonstrate a database solution for a business or organization.

**RATIONALE:**

As a tertiary Adventist University, it is important to contribute to the mission of the Adventist Church and to uplift Society by training qualified students to understand and learn:

* how to evaluate information based on quantitative and/or qualitative data
* the impact that database designs have on user interfaces and application program structure.
* how to create innovative strategies and/or products that meet identified needs of an organization.
* importance of database and proper implementation of concepts administration in an organization.

# LEARNING OUTCOMES:

Upon successful completion of this course, the students should reliably acquire the following

* **Knowledge**-
* Explain the roles of the individuals who design, implement, use, and administer databases.
* Explain the three-tiered location architecture for databases and database

Processing.

* Draw simple data models, which show the scope of the database.
* Draw an E-R diagram to represent common business situations.
* Convert a many-to-many relationship to an associative entity.
* Describe the physical database design process, its objectives, and deliverables.
* Translate a relational data model into efficient database structures.
* Define a database using the SQL data definition language.
* Write single and multiple table queries using SQL commands
* **Skills-**
* Collect, analyze and organize information/data
* Apply critical thinking in problem solving and making decisions
* Design and implement a relational database and supporting applications
* Understand multi-user database processing on LANs in client-server systems
* **Values-**
* Learn to respect and protect other people’s data/information
* Appreciate the importance of personnel, operational or procedural, systems in database management and administration.
* Learn to be trustworthy, dependable and reliable.
* Understand that Christian ethics should have priority over culture and customs in information security

**DELIVERY METHODS**

The instructional methods of this course include lectures with lecture notes, demonstrations, hands-on exercises and Team based Project development.

# RECOMMENDED TEXTBOOKS:

1. **Fundamentals of Database Systems.** Ramez Elmasri. 7th edition Pearson Education,

Inc., 2017.

1. **Fundamental of Relational Database Management Systems**

By S. Sumathi and S. Esakkirajan. Springer-Verlag Berlin Heidelberg, 2007.

1. **Modern Database Management**

Jeffrey A. Hoffer, Mary B. Prescott, 8th Edition, Prentice Hall, 2007

1. **Database Processing: Fundamentals, Design and Implementation**

David M.Kroenke, Prentice Hall, Upper Saddle River, NJ, 2004

1. **Database System Concepts.**

**Silberschatz−Korth−Sudarshan:** McGraw−Hill Companies, 2001

# Course Procedures and Requirements

**CLASS ATTENDANCE:** - “Every student is required to attend classes regularly and punctually, unless ill or prevented by some recognized emergency. Students who absent themselves from class for more than three weeks during the semester shall merit an F grade. Authorized leave of absence from campus does not excuse the student from classes, or relieve the student of the required course work’ *(BU Academic Bulletin 2012-2015 p.13).*

**PARTICIPATION:** -Students are to actively engage in topic discussion and sharing of ideas in class.

**TARDINESS/CONDUCT OF STUDENTS IN CLASS:** - Lateness to class is unacceptable; students are not allowed to operate their cell phones, iPods and other electronic mobile gargets during classes, except with the permission of the teacher. Eating and chewing off bubble gums and drinking (water exempted) is also not allowed except with the permission of the teacher. Very importantly, students are required to dress in compliance with the university dress code and wear their identity cards while in class.

**SHORT DEVOTIONALS/PRAYER:** - Spiritual nurture is a part of whole person development, and team spirit is our strength; thus, every student is required to participate in the devotional exercise and prayer in class.

SUBMISSION OF ASSIGNMENT: As the teacher wishes to receive the assignments with the regulations of the Academic Bulletin.

**LATE ASSIGNMENTS:** Assignments could be turned in earlier, but not later than the deadline set by the teacher.

**GUIDELINE FOR WRITTEN WORK:**

1. Unannounced quiz
2. The mid-semester examination
3. Project work
4. Assignments
5. Final examination

**ACADEMIC INTEGRITY/HONESTY**: “Babcock University has zero tolerance for any form of academic dishonesty. Morally and spiritually, the institution is committed to scholastic integrity. Consequently, both students and staff are to maintain high, ethical Christian levels of honesty. Transparent honest behavior is expected of every student in all spheres of life. Academic dishonesty includes such things as plagiarism, unauthorized use of notes or textbooks on quizzes and examinations, copying or spying the test or paper of another student (formal or take-home), talking to another student during examinations. Academic matter would automatically result in a failing grade for the examination, and suspension, or outright dismissal from the university. Academic dishonesty issues are referred to SPEAM (Senate Panel on Examination and Academic Misconduct) who investigates and makes recommendations to Senate. Penalties for examination and academic misconduct are spelt out in the *student’s handbook* and in other regulations as published from time to time” *(BU Academic Bulletin2012- 2015 p.18).*

# GRIEVANCE PROCEDURE

“Students who believe that their academic rights have been infringed upon or that they have been unjustly treated with respect to their academic program are entitled to a fair and impartial consideration of their cases. They should do the following to effect a solution:

1. Present their case to the teacher(s) concerned
2. If necessary, discuss the problem with the Head of Department
3. If agreement is not reached at this level submit the matter to the School Dean
4. Finally, ask for a review of the case by the Grievance Committee
5. A fee is charged for remarking of scripts. If a student’s grievance is upheld after an external examiner has remarked the script, the grade would be credited to the student. The lecturer will be given a letter of reprimand and will be asked to refund the fees to the student. If the student’s grievance is not sustained, the student will be given a letter of reprimand and the original grade retained” *(BU Academic Bulletin2012-2015 p.18).*

**TEACHING/LEARNING METHODOLOGIES:**

1. Lectures

2. Reading / Writing Assignments

3. Tutorials/Labs

4. Project

# COURSE ASSESSMENT/EVALUATION

***Continuous Assessment:***

Class Attendance: 5%

Quizzes & Tests: 10%

This will be administered un-announced

Assignments/Labs: 10% = 60%

Mid-Semester Exam: 15%

The examination is given in a variety of formats.

The date of the exam will be announced in advance.

Project: 20%

There will be a defense of group projects.

Final Semester Exam: 40%

This examination is cumulative and is given

in a variety of formats

|  |  |  |
| --- | --- | --- |
| **Weeks** | **Topic/Content** |  |
| **Lesson-1** | **Introduction-**   * Data vs. Information * History of the Database * Major Transformations in Computing | **Week 1** |
| **Lesson- 2** | **Entities and Attributes**   * Conceptual and Physical Models * Entities, Instances, Attributes, and Identifiers * Entity Relationship Modeling and ERDs | **Week 2** |
| **Lesson-3** | **Relationship Basics**   * Identifying Relationships * ER Diagramming Conventions * Speaking ERDish and Drawing Relationships * Matrix Diagrams | **Week 3** |
| **Lesson- 4** | **Super/Sub Types and Business Rule**   * Supertypes and Subtypes * Documenting Business Rules | **Week 4** |
| **Lesson- 5** | **Relationship Fundamentals**   * Relationship Transferability * Relationship Types * Resolving Many-to-Many Relationships * Understanding CRUD Requirements | **Week 5** |
| **Lesson-6** | **UIDs and Normalization**   * Artificial, Composite, and Secondary UIDs * Normalization and First Normal Form * Second Normal Form * Third Normal Form | **Week 6** |
| **Lesson-7** | **Mapping**   * Introduction to Relational Database Concepts * Basic Mapping: The Transformation Process * Relationship Mapping * Subtype Mapping | **Week 7** |
| **Database Programming with SQL** | | |
| **Lesson-8** | **Introduction**   * Oracle Application Express * Relational Database Technology * Anatomy of a SQL Statement | **Week 8** |
| **Lesson- 9** | **Statements and Clauses**   * SELECT Statements * WHERE Clause * ORDER BY Clause * GROUP BY Clause * HAVING Clause * Set Operators | **Week 8** |
| **Lesson- 10** | **Introduction to Functions**   * Case and Character Manipulation * Number Functions * Date Functions * Conversion Functions * NULL Functions * Conditional Expressions | **Week 9** |
| **Lesson- 11** | **JOINs**   * Cross Joins and Natural Joins * Join Clauses * Inner versus Outer Joins * Self-Joins and Hierarchical Queries | **Week 9** |
| **Lesson- 12** | **Subqueries**   * Fundamentals of Subqueries * Single-Row Subqueries * Multiple-Row Subqueries * Correlated Subqueries * Ensuring Quality Query Results | **Week 10** |
| **Lesson- 13** | * DML * DDL * TCL * Constraints * Views * Privileges and Regular Expressions | **Week 10** |
|  | **Presentation of Database Project** | **Week 11 – 12** |
|  | **Final Exams** |  |

# GRADE SCALE

Currently, the 5-point grading system adopted by the University Senate translates as follows:

|  |  |  |
| --- | --- | --- |
| Grades | Marks-Quality | Range Points |
| A | 80-100 | 5.00 |
| B | 60-79 | 4.00 |
| C | 50-59 | 3.00 |
| D | 45-49 | 2.00 |
| E | 40-44 | 1.00 |
| F | 0-39 | 0.00 |

**INCOMPLETE GRADE:** An incomplete grade may only be assigned to a student upon request, due to an emergency situation that occurred within that semester, which prevented completion of an/some assignments, quizzes, or examination. Such a student would complete a contract form, obtainable from the Registrar, after agreement with the teacher. The form must be signed by the teacher, the student, the HOD, the dean, the Registrar, and the Senior Vice President (SVP) before contract begins. The original copy of the incomplete form will be sent to the Registrar with copies to the teacher, the student, the HOD, the dean, and the SVP. An incomplete grade (I) reverts to the existing grade if contract is not completed by the end of the following semester (including summer semester, except for examinations), *(BU Academic Bulletin 2012-2015 p. 20).*

**NOTE**

* Academic dishonesty such as plagiarism (copying others work) of code is prohibited, offenders will be penalized
* Use of mobile phone in the class is not allowed
* Late submission of assignment will not be accepted
* Late coming to class will not be tolerated