

**University of Computer Studies, Yangon**

**Faculty of Information Science**

**2019-2020 Academic Year**

Subject Code	CS-304	Subject Name	Database Management System
Semester	Second	Course Coordinator	Daw Khaing
Credit	3		
Total Hour	40 Hours		
Weeks	16 weeks		
No of periods	48 Periods (1 period :50 Mins)/ 3 periods per week		

**Course Description**

This module is intended to provide the knowledge of backend operation of Relational Database Management System. This module has two goals. First goal is to understand the conversion of Structured Query Language to relational algebra and then relational calculus by database management system itself. Second goal is to introduce the students with the skill of building the view and the optimize query usage for retrieving the required data from the database efficiently. In addition the student will learn about how to handle the missing value in database by DBMS. The course will be supported by practical lectures involving the development of database for a real world application and query usage.

**Course Objective**

- To understand how to transform the SQL to a set of operators in relational algebra operators and relational calculus by DBMS
- To understand what views are for and how to use them.
- To understand query processing in Database Management System
- To understand what missing values and how to solve them
- To improve the knowledge for developing the database design of the real world application

**Learning Outcomes**

- Express the queries using relational algebra and relational calculus
- Apply the knowledge of view and query usage in the query processing.
- Explain about how queries are processed, optimized and evaluated in a DBMS.
- Explain about the query execution plan and how query execution plans are transformed/rewritten
- Apply the knowledge of missing information for handling the data processing
- Implement the view and query structure for building database design for real world application domain

**Prerequisite for the Course**

- Introduction to Database Management System
- Basic concept of Database Programming

**Major Topic covered in the course**

- Relational Algebra
- Relational Calculus
- View
- Optimization
- Missing Information

## Overview of Learning Activities

- **Lectures:** Key concepts will be explained in lectures in which course material will be presented and the subject matter will be illustrated with examples.
- **Tutorial sessions:** Focus on analyzing and problem solving of given application.
- **Practical sessions:** Provide practice for developing the database design with DBMS software

## TextBook

- C.J.Date, “An Introduction to Database Management System”, 7th Edition, Addison-Wesley publishing House, May 2000.

## Reference Book

- Ramez Elmasri and Shamkant B. Navathe, “Fundamentals of Database Systems”, Fifth Edition, Pearson Education, 2008.
- [Jeffery A. Hoffer, V.Ramesh, Heikki Topi, “Modern Database Management System, 12th edition, 2016

## Tools

1. MySQL Server 5.1 or 5.5

## Learning Assessment

Paper Exam	:	60%
Practical Exam	:	10%
Project	:	10%
Quiz	:	10%
Assignment/Tutorial	:	5%
Class Participation	:	5%

## Course Policy

### Participation

Attendance is a prerequisite, not a substitute for class participation. Participation mechanisms include: (1) responding to questions asked in class, (2) initiating discussions on new points in class and (3) discussing cases and offering solutions to problems.

### Tutorial Test and Quizzes

The student is expected to complete the tutorial tests and Quizzes at the scheduled time. If a tutorial test or quiz is missed, there will be no make-ups tutorial or quiz for missing student. No make – ups test or resubmission and extra credit test are not available in this course. Tutorial tests and quizzes are based upon all learning objectives to be reached before the scheduled date.

### Assignment

There will be theory and practical assignments which must be submitted. The assignment may be individual or Group. The individual assignment is individual work and tests the ability of each student. Group assignment is team work and tests the ability of collaboration of student to complete the given work.

The due dates for the given assignments are going to be declared by the instructor and there will be no make-ups or individual extensions. No make –ups Assignment or resubmission and extra credit assignment are not available in this course.

In addition to the hardcopies of assignments, electronic (and certifiably virus free) copies should be e-mailed to instructor on the date they are due.

## Project

The paper project will be prepared and make the presentation at the end of first semester. The project must be based on the lecture of this course and it is group assignment. The project guideline and schedule are declared by the instructor.

## Intellectual Honesty

By departmental policy, the discovery of plagiarism (i.e. copying from another's assignment paper or practical solution or tutorial paper) will result in a reduction of result marks of relevant students.

## Lecture Plan

**CS-304** : Database Management System **Second Semester**  
**Text Book** : An Introduction to Database Systems (7th Edition)by C.J.Date  
**Period** :

No	Chapter	Page	Period	Remark
1	Chapter(1) Relational Algebra 6.1 Introduction 6.2 Closure Revisited 6.3 Syntax 6.4 Semantics 6.5 Examples 6.6 What is the Algebra For? 6.7 Additional Operators 6.8 Grouping and Ungrouping 6.9 Relational Comparisons Query Exercises Discussion and Review	150 -183	10	
2	Chapter (7) Relational Calculus 7.1 Introduction 7.2 Tuple Calculus 7.3 Examples 7.4 Calculus and Algebra 7.5 Computational Capabilities 7.6 Domain Calculus 7.7 SQL Facilities Query Exercises Exercises and Review	198 - 217	10	
3	Chapter(9) View 9.1 Introduction 9.2 What are views For? 9.3 View Retrievals 9.4 View Updates 9.5 Snapshots 9.6 SQL Facilities 9.7 Summary Exercises and Review	289-326	7	
4	Chapter(17) Optimization 17.1 Introduction	537-563	9	

	17.2 Motivation 17.3 Overview of Query Processing 17.4 Expression Transformation 17.5 Database Statistics 17.6 Divide and Conquer Strategy 17.7 Implementation the relational operators 17.8 Summary Exercises and Review			
5	Chapter(18) Missing Information 18.1 Introduction 18.2 An overview of 3VL approach 18.3 Some consequences of the forgoing scheme 18.4 Nulls and Keys 18.5 Outer join 18.6 Special Values 18.7 SQL Facilities 18.8 Summary Review and Exercises	584-605	9	
6	Review for all chapters and Project Presentation		3	
	Total		48	