AMITY UNIVERSITY
UTTAR PRADESH

FORMAT FOR COURSE CURRICULUM

L	T	P/S	SW/FW	No. of PSDA	TOTAL CREDIT UNITS
2	-	2	2	5	4

Course Title: INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS **Credit Units: 4**

Course Level: UG   **Course Code:**   CSIT132

Course Objectives:
The objectives of this course is to:

To expose the students to the fundamentals & basic concepts in Data Base Management Systems.

To discusses architecture of Database Systems with concept of relational model & ER model.

To explain techniques for database design, Normalization and database recovery and protection.

Pre-requisites:
Basic Knowledge of Programming Language

Course Contents/Syllabus:

	Weightage (%)
Module I Introduction to DBMS	20%
Descriptors/Topics Definition of DBMS, Data Independence, DBMS Architecture, Levels, Database Administrator, File System Approach Vs DBMS Approach, Advantages of Using a DBMS, Data Models , Schemas, and Instances.	
Module II Relational Database & ER Model	20%

Descriptors/Topics	
Relational System, Codd's Rule, Relational Model, Tables and Views, Entity, Types of Entity, Weak Entity Attributes , Entity sets , Entity – Relationship Diagrams, case study.	
Module III Relational Model Objects	**20%**
Descriptors/Topics Domains and Relations, Relational Data Integrity ; Primary Key, Candidate Key , Foreign Key and their rules; Relational operators, Relational Algebra, Relational Calculus, SQL Language, Data definition, Data retrieval and update operations.	
Module IV Database Design	**20%**
Descriptors/Topics Definition Of Functional Dependencies, Process Of Normalization, First Normal Form, Second Normal Form, Third Normal Form. Boycee Codd Normal Form, Fourth Normal Form, Fifth Normal Form, case study.	
Module V Data Recovery & Protection	**20%**
Descriptors/Topics Recovery-Transaction recovery, System recovery, Media Recovery, Concurrency Control Techniques: Locking, Dead Lock, Introduction to Serializability, Security.	

Course Learning Outcomes:

The student will be able to
· Reproduce good knowledge and understanding of the architecture and functioning of DBMS.
· Apply the ideas and practices of good database design using appropriate software.
· Identify the track of database technology and their implication so as to manage and plan database system developments.
· Produce normalized relations with the use of various normalization techniques.
  ● Apply the concurrency techniques for consistent data.

Pedagogy for Course Delivery:

Subject will be taught on the basis of lectures delivered in class room , practical implementation of concepts learn in the classroom and discussing different case study covering different module. Students will be taught using technical aids like Projectors by way of PowerPoint presentations.

List of Self-Work activities:

Activity 1	Self-Work activities can be conducted by dividing the class into group of 3-4 students and same will be evaluated by board of faculty members along with the group report. Some of the suggested activities are: 1 Case study on Banking system 2.Case study on Automation system of marketing company 3. Case study on Healthcare system 4. Case study on Normalization

	5. Case study on Airline company
Activity 2	Development of ER Diagram:

1. A publishing company produces scientific books on various subjects. The books are written by authors who specialize in one particular subject. The company employs editors who, not necessarily being specialists in a particular area, each take sole responsibility for editing one or more publications. A publication covers essentially one of the specialist subjects and is normally written by a single author. When writing a particular book, each author works with on editor, but may submit another work for publication to be supervised by other editors. To improve their competitiveness, the company tries to employ a variety of authors, more than one author being a specialist in a particular subject.

2. A General Hospital consists of a number of specialized wards (such as Maternity, Paediatry, Oncology, etc). Each ward hosts a number of patients, who were admitted on the recommendation of their own GP and confirmed by a consultant employed by the Hospital. On admission, the personal details of every patient are recorded. A separate register is to be held to store the information of the tests undertaken and the results of a prescribed treatment. A number of tests may be conducted for each patient. Each patient is assigned to one leading consultant but may be examined by another doctor, if required. Doctors are specialists in some branch of medicine and may be leading consultants for a number of patients, not necessarily from the same ward.

3. A database is to be designed for a Car Rental Co. (CRC). The information required includes a description of cars, subcontractors (i.e. garages), company expenditures, company revenues and customers. Cars are to be described by such data as: make, model, year of production, engine size, fuel type, number of passengers, registration number, purchase price, purchase date, rent price and insurance details. It is the company policy not to keep any car for a period exceeding one year. All major repairs and maintenance are done by subcontractors (i.e. franchised garages), with whom CRC has long-term agreements. Therefore the data about garages to be kept in the database includes garage names, addressees, range of services and the like. Some garages require payments immediately after a repair has been made; with others CRC has made arrangements for credit facilities. Company expenditures are to be registered for all outgoings connected with purchases, repairs, maintenance, insurance etc. Similarly the cash inflow coming from all sources - car hire, car sales, insurance claims - must be kept of file.CRC maintains a reasonably stable client base. For this privileged category of customers special credit card facilities are provided. These customers may also book in advance a particular car. These reservations can be made for any period of time up to one month. Casual customers must pay a deposit for an estimated time of rental, unless they wish to pay by credit card. All major credit cards care accepted. Personal details (such as name, address, telephone number, driving licence, number) about each customer are kept in the database.

4. A database is to be designed for a college to monitor students' progress throughout their course of study. The students are reading for a degree (such as BA, BA(Hons) MSc, etc) within the framework of the modular system. The college provides a number of module, each being characterised by its code , title, credit value, module leader, teaching staff and the department they come from. A module is co-ordinated by a module leader who shares teaching duties with one or more lecturers. A lecturer may teach (and be a module leader for) more than one module. Students are free to choose any module they wish but the following rules must be observed: some modules require pre-requisites modules and some

	degree programmes have compulsory modules. The database is also to contain some information about students including their numbers, names, addresses, degrees they read for, and their past performance (i.e. modules taken and examination results).
Activity 3	Implementation and description of SQL Functions: Date, Numeric, Character, Aggregate &etc.
Activity 4	Implementation of database query in the form of relational algebra and relational calculus

Lab/ Practicals details:

List of Experiments:

1) Create a table "PRODUCTS" with the below mentioned structure: Product ID NUMBER(11) Supplier ID NUMBER(11) Category ID NUMBER(11) Quantity Per Unit VARCHAR2(20) Unit Price NUMBER(11) Units In Stock NUMBER(11) Units On Order NUMBER(11) Product ID should be the Primary Key. 2) Consider the following tables: WORKS(Pname,Cname,Salary) LIVES(Pname,Street,City) LOCATED_IN(Cname,City) MANAGER(Pname,Mgername) Where Pname=Person name, Cname= Company name and Mgrname = Manager name. Write the SQL for the following: a) List the names of the people who work for the company Wipro along with the cities they live in. b) Find the people who work for the company "Infosys" with a salary more than Rs. 50000/-. List the names of the people , along with the street and city addresses. c) Find the names of the persons who live and work in the same city. d) Find the names of the persons who dod not work for "Infosys". e) Find the persons whose salaries are more than that of all of the "Oracle" employees. f) Find the names of the companies that are located in every city where the company "Infosys" is located. 3) Create table EMP and DEPT with the below mentioned structure Structure for EMP table	

EmpID NUMBER(4)
DeptID VARCHAR2(10)
EmpName CHAR(10)
Job CHAR(10)
HireDate DATE
Salary NUMBER(7, 2)
Commission NUMBER (7, 2)
Structure for DEPT table
DeptId VARCHAR2(10)
Deptname VARCHAR2(20)
No_of_Faculties NUMBER(2)
In table EMP : EmpID should be the Primary Key and DeptID should be the foreign key.
In table DEPT : DeptId should be the primary key.

4) INSERT the following values in the EMP table:
a) 1001,SET_01,Harrey,SE,01-Jan-2009,15000,3
b) 1002,SET_02, Ron, SSE,15-Feb-1998,20000,4
c) 1003,SEM_05, Peter, Manager,15-April-1999,40000,5
d) 1002,SED_07, Jolie,Assistant Manager,15-Dec-1998,50000,5
e) 1008,SET_08, Santy, SSE,15-Feb-2000,20000,4
f) 1008,SED_10, San, SE,10-Feb-2009,22000,5

5) Considering the above table i.e EMP write the queries for the following:
a) Find out the number of employees having "manager" as job.
b) Display only the jobs with maximum salary greater than or equal to 3000
c) Find all those employees whose job does not start with 'M'.
d) Find the names of the employees whose name starts with 'S'.
e) Find the names of the employees who are Managers and their date of joining is after "02-Jan-2006".
f) For describing the structure of the EMP table and DEPT table.
g) For getting the average salary of the employees from EMP table.
h) For displaying the current date and give the column a name "DATE".
i) For converting the name of the employee into uppercase where the employee name is "Santy"
j) Create a sequence with name SEQ_EMP , which will generate numbers from 1 to 99 in ascending order with an interval of 1. The sequence must
start from 1 after generating the number 99.
k) Displaying the names of the employees who have an a and an e in their names.

6. Considering the table DEPT in question 3, find the total number of departments.

7. Alter the EMP table for the changing the width of the field EmpID from 4 to 10.

8. .Alter the DEPT table for changing the width of the field No_of_Faculties from 2 to 4.

9. Delete all the records from the EMP table where the EmpName starts with "S",

10. Insert some values in the PRODUCTS table created in Question 1 and then DROP the table PRODUCTS.

11. Update the EMP table for the following values:
a. Increase the salary of all the employees by 10% where the job is SE and SSE.
b. Change the hiredate of the employee "Harry" to 01-Feb-2009.
c. Update the salary of the employees to an increase of 15% where deptid is SED_07.

12. Alter the table EMP for the following:
a. Add one more field in the table i.e DOB DATE
b. Drop the column named Commission from the EMP table.

13. Write a query to select all the records from the EMP table.

14. Write a query to select all the records from the DEPT table.

15. Write a query to select the distinct deptid from EMP table.

16. Write a query to find the name and salary of the employee from EMP table where the salary is maximum.

17. Create a view amed v_EMP on the table EMP,DEPT by selecting the following fields
Emp ID, Dept ID, Emp Name, Job
Where the EMP.Dept ID = DEPT. DeptId.

18. Create a synonym S_EMP on the table EMP.
Basic features, Block Structure of a PL/SQL Programs, Control Structures, Exception Handling, Cursor, Procedure, function and Triggers, Internet features of

Oracle, Overviews of SQLJ 19. Write a PL/SQL program for: a. Printing the Fibonacci series from 1 to 50. b. Printing the smallest number among any three numbers. c. Printing the table of any specific number entered. 20. Create a trigger named "Client_Master" which keeps track of records deleted or updated when such operations are carried out. Records in this table are inserted into table "Audit" when database trigger fires due to an update or delete statement fired on this table "Client". Table: Client Column name Data type Size Client_no Varchar2 6 Name Varchar2 20 Address Varchar2 30 Balance_Due Number 10,2 Write a sql query to drop the table EMP, can we drop a table with data in it.	

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)
75	25

Theory Assessment (L&T):

Continuous Assessment/Internal Assessment (40 %)					End Term Examination (60%)
Components (Drop down)	Viva	CT	Self Work	Attendance	
Weightage (%)	5	10	20	5	60

Lab/ Practical/ Studio Assessment:

	Continuous Assessment/Internal Assessment (40 %)	End Term Examination (60 %)

Components (Drop down	Mid-Term Exam	Lab Record	Continuous Performance	Internal Viva	Attendance	Practical Evaluation	Viva
Weightage (%)	10	10	10	5	5	40	20

Text Reading:
- Elmasri & Navathe," Fundamental of Database Systems", Pearson Education, Seventh Edition, 2016
- Korth & Sudarshan," Database System Concepts",TMH, Sixth Edition, 2010
- C.J.Date," An Introduction to Database System", Pearson Education, Eighth Edition, 2009

References:
- Bipin C Desai," Introduction to Database Systems", Galgotia publications, Revised Edition, 2010
- Kevin Loney & Geroge Koch ,"Oracle 9i :The Complete Reference", TMH Edition 2002
- Ivan Bayross," SQL,PL/SQL The Programming Language Of Oracle", BPB Publications, Third Revised Edition, 2009.