


Government of Karnataka
Department of Technical Education
Bengaluru

	Course Title: DBMS and GUI lab		
	Scheme (L:T:P) : 0:2:4	Total Contact Hours: 78	Course Code: 15CS36P
	Type of Course: Tutorial and Practical's	Credit : 03	Core/ Elective: Core
CIE- 25 Marks		SEE- 50 Marks	

Prerequisites

Knowledge of basics DBMS theoretical concepts

Course Objectives

1. Provide strong formal foundation in database concepts.
2. Understand relational data model and systematic database design approach including conceptual design and logical design using data modelling tool.
3. Learn the techniques of query processing using SQL engines.
4. Develop a database application using any of the GUI application products.

Course Outcome

On successful completion of the course, the students will be able to attain CO:

Course Outcome		Experiment linked	CL	Linked PO	Teaching Hrs
CO1	Explain the underlying concepts of database technologies. Design and implement a database schema for a given problem-domain.	1,2,3	U, A	1 to 10	03
CO2	Apply Normalization to a database.	1,2,3	U, A	1 to 10	03
CO3	Illustrate and query a database using SQL DML/DDI commands To motivate the students to relate all these to one or more commercial product environments as they relate to the developer tasks	1 to 17	A	1 to 10	48
CO4	Design, create, build, and debug Gambas /Visual Basic Database applications.	18	A	1 to 10	24
			Total sessions		78

Legends: R = Remember U= Understand; A= Apply and above levels (Bloom's revised taxonomy)

Course-PO Attainment Matrix

Course	Programme Outcomes									
	1	2	3	4	5	6	7	8	9	10
DBMS and GUI lab	3	3	3	3	3	3	3	3	3	3

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If $\geq 40\%$ of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If $< 5\%$ of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

List of Graded Practical Exercises

- Using any open source data modelling tool (MySQL/Rational Rose/ERwin), design and develop a ER diagram for the following Library database. Specify relevant Referential constraints.

BOOK AUTHORS

<u>BOOK_ID</u>	<u>AUTHOR_NAME</u>
----------------	--------------------

PUBLISHER

<u>NAME</u>	<u>ADDRESS</u>	<u>PHONE</u>
-------------	----------------	--------------

BOOK COPIES

<u>BOOK_ID</u>	<u>BRANCH_ID</u>	<u>NO_COPIES</u>
----------------	------------------	------------------

BOOK LOANS

<u>BOOK_ID</u>	<u>BRANCH_ID</u>	<u>CARD_NO</u>	<u>DATE_HIRED</u>	<u>DUE_DATE</u>
----------------	------------------	----------------	-------------------	-----------------

LIBRARY BRANCH

<u>BRANCH_ID</u>	<u>BRANCH_NAME</u>	<u>ADDRESS</u>
------------------	--------------------	----------------

BORROWER

<u>CARD_NO</u>	<u>NAME</u>	<u>ADDRESS</u>	<u>PHONE</u>
----------------	-------------	----------------	--------------

- Consider a GRADE_BOOK database in which instructors within an academic department record point earned by individual students in theory classes. The data requirements are summarised as follows:

- Each student is identified by a unique identifier, first and last name and an email address.
- Each instructor teaches certain courses each term. Each course is identified by a course number, a section number and the term in it is taught. For each course he or she teaches, the instructor specifies the minimum number of points required in order to earn letter grades, A, B, C, D and F. For Ex. 90 points for an A, 80 points for a B, 70 points for a C and so forth.
- Students are enrolled in each course taught by the instructor.
- Each course has a number of grading components (such as mid-term exam, final exam, project and so forth). Each grading component has a maximum number of points (100 or

50) and a weight (20% or 10%). The weight of all the grading components of a course is 100.

- Finally, the instructor records the points earned by each student in each of the grading components in each course. For Ex. The student 1234 earns 84 points for a mid-term exam, grading component of the section 2 course CS 2310 in the fall term of 2009. The mid-term exam grading component may have been defined to have a maximum of 100 points and a weight of 20% of the course grade.

3. Create the following tables for a COMPANY database

EMPLOYEE

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno
-------	-------	-------	-----	-------	---------	-----	--------	-----------	-----

DEPARTMENT

Dname	<u>Dnumber</u>	Mgr_ssn	Mgr_start_date
-------	----------------	---------	----------------

DEPT_LOCATIONS

<u>Dnumber</u>	<u>Dlocation</u>
----------------	------------------

PROJECT

Pname	<u>Pnumber</u>	Plocation	Dnum
-------	----------------	-----------	------

WORKS_ON

<u>Essn</u>	<u>Pno</u>	Hours
-------------	------------	-------

DEPENDENT

<u>Essn</u>	<u>Dependent_name</u>	Sex	Bdate	Relationship
-------------	-----------------------	-----	-------	--------------

4	Illustrate the use of constraints
	NOT NULL
	PRIMARY KEY
	UNIQUE
	CHECK
	DEFAULT
	REFERENCES
5	DATA MANIPULATION : INSERTING VALUES INTO A TABLE
6	Illustrate the use of SELECT statement
7	Conditional retrieval - WHERE clause
8	Query sorted - ORDER BY clause
9	Grouping the result of query - GROUP BY clause and HAVING clause
10	Aggregate functions in SQL (Count, Sum, Max, Min, Avg)
11	SQL operators(And, Or, Like, Between, In)
12	Query multiple tables using JOIN operation.
13	Write nested and complex queries using multiple tables.
14	Perform UPDATE, ALTER, DELETE, DROP operations on tables
15	Illustrate the use of CREATE VIEW command and manipulating
16	Use COMMIT and ROLL BACK commands
17	Use SAVEPOINT commands
18.	GUI

	<ol style="list-style-type: none"> 1. To study about various Gambas/Visual Basic (front end) or any other front end tool 2. Design a form to use various tools like label, text, combo box, list boxes, check box, option box, horizontal and vertical scroll bars, etc. Illustrate the above with an example such as survey form, registration form for an event or another other example. 3. Design a menu driven form to process student's results or a shopping list or any other example. 4. Generate a report for student's results or employee details or shopping list or any other example. 5. Based on any database specified in Question No. 1, 2 or 3. The application must be menu driven having suitable active controls with database connectivity. Generate different reports as per user requirements.
--	--

References

1. Fundamentals of Database system 5th Edition, Ramez Elmasri, Shamkan B. Navthe, Pearson Education
2. Visual Basic 6 How to program by Deitel & Associates
3. http://www.tutorialspoint.com/dbms/sql_overview.htm
4. <http://www.sql-tutorial.net/>
5. <http://www.visualbasicbooks.com/vb6introtutorial.html>
6. <http://gambas.sourceforge.net/>
7. <http://gambasdoc.org/help>

Suggested list of student activities

Note: The following activities or similar activities for assessing CIE (IA) for 5 marks (Any one)

Student activity like mini-project, surveys, quizzes, etc. should be done in group of 3-5 students.

1. Each group should do any one of the following type activity or any other similar activity related to the course and before conduction, get it approved from concerned course co-ordinator and programme co-ordinator.
2. Each group should conduct different activity and no repeating should occur.
 - Build DBMS application for processing students details such as personal details, results, attendance etc. Use minimum 3-4 tables
 - Build DBMS application for maintain a mini library of CD's. Use minimum 3-4 tables
 - Using any ER diagram modelling tool demonstrate modelling of any database containing 3-4 tables.

Course Delivery

The course will be delivered through Demonstration and Practices

Course Assessment and Evaluation Scheme

Method	What		To whom	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes
Direct Assessment	CIE (Continuous Internal Evaluation)	IA	Students	Two tests (average of two tests)	10	Blue books	1,2,3,4
				Record	10	Record	
				Student activity	05	Report	1,2,3,4
				Total	25		
	SEE (Semester End Examination)	End Exam		End of the course	50	Answer scripts at BTE	1,2,3,4
Indirect Assessment	Student Feedback on course		Students	Middle of the course		Feedback forms	1,2,3(half session) Delivery of course
	End of Course Survey			End of the course		Questionnaires	1,2,3, 4 Effectiveness of Delivery of instructions & Assessment Methods

***CIE** – Continuous Internal Evaluation

***SEE** – Semester End Examination

Note:

1. I.A. test shall be conducted as per SEE scheme of valuation. However obtained marks shall be reduced to 10 marks. Average marks of two tests shall be rounded off to the next higher digit.
2. Rubrics to be devised appropriately by the concerned faculty to assess Student activities.

Questions for CIE and SEE will be designed to evaluate the various educational components (Bloom's taxonomy) such as:

Sl. No	Bloom's Category	%
1	Remembrance	10
2	Understanding	20
3	Application	70

Note to IA verifier: The following documents to be verified by CIE verifier at the end of semester

1. Blue books (10 marks)
2. Record (10 marks)

3. Student suggested activities report for 5 marks
4. Student feedback on course regarding Effectiveness of Delivery of instructions & Assessment Methods.

Format for Student Activity Assessment

DIMENSION	Unsatisfactory 1	Developing 2	Satisfactory 3	Good 4	Exemplary 5	Score
Collection of data	Does not collect any information relating to the topic	Collects very limited information ; some relate to the topic	Collects some basic information ; refer to the topic	Collects relevant information ; concerned to the topic	Collects a great deal of information ; all refer to the topic	3
Fulfill team's roles & duties	Does not perform any duties assigned to the team role	Performs very little duties	Performs nearly all duties	Performs all duties	Performs all duties of assigned team roles with presentation	4
Shares work equally	Always relies on others to do the work	Rarely does the assigned work; often needs reminding	Usually does the assigned work; rarely needs reminding	Does the assigned job without having to be reminded.	Always does the assigned work without having to be reminded and on given time frame	3
Listen to other Team mates	Is always talking; never allows anyone else to speak	Usually does most of the talking; rarely allows others to speak	Listens, but sometimes talk too much	Listens and contributes to the relevant topic	Listens and contributes precisely to the relevant topic and exhibit leadership qualities	3
TOTAL						13/4=3.2=4

**All student activities should be done in a group of 4-5 students with a team leader.*

Scheme of Valuation for End Examination

1	Creating and inserting records for minimum two tables. Use minimum 2 constraints	10
2	Executing minimum 3 queries	15
3	Build a GUI program for the table created with data grid view and options such as Add, Delete, Modify etc.	15
4	Viva-Voce	10
Total		50

***Evaluation should be based on the screen output only. No hard copy required.*

***Change of question is allowed only once. Marks of 05 should be deducted in the given question.*

Resource requirements for DBMS & GUI Lab

(For an Intake of 60 Students [3 Batches])

Sl. No.	Equipment	Quantity
1	PC systems (latest configurations with speakers)	20
2	Laser Printers	01
3	Networking (Structured) with CAT 6e / wireless 24 Port switches / Wireless Router I/O Boxes for networking(as required)	03
4	Broad Band Connection	01

***Open Source Software should be encouraged*



MODEL QUESTION BANK

1. a) Create table Employee and Dependent as per the following schema: Identify the Primary and referential constraints on the table. Specify suitable constraint on the salary column such that $12000 < \text{Salary} < 120000$.

i) Employee Table

Fname	Lname	<u>ssn</u>	Bdate	Address	Sex	Salary	Super ssn	Dno
-------	-------	------------	-------	---------	-----	--------	--------------	-----

ii) Dependent Table

Essn	Dependent_name	Sex	Bdate
------	----------------	-----	-------

b) Insert records into the above tables.

c). Queries to be executed

- Add another column Relationship to dependent Table
- Retrieve all female dependents of the employees who have joined service after 31-01-2010
- Retrieve the no. Of employees and total salary drawn by the employees belonging to department no. 10.

d) Create a GUI to show any one of the table contents(include data grid view and perform operations such as add, delete, modify etc)

2. a) Create table BOOK ,BOOK_AUTHORS and PUBLISHER with following Schema. Identify the Primary and referential constraints on the tables. Specify default constraint on gender column of BOOK _AUTHOR table.

i) BOOK

<u>Book_id</u>	Title	Publisher_name
----------------	-------	----------------

ii) BOOK_AUTHOR

<u>Book_id</u>	<u>Author_name</u>	Gender
----------------	--------------------	--------

iii) PUBLISHER

<u>Name</u>	Address	Phone
-------------	---------	-------

b) Insert records into the above tables.

c) Queries to be executed

- Retrieve the book details of all the books authored by “Sharma”.
- Delete the record for the publisher by name “sapna”.
- For each publisher retrieve the total number of book titles published.

d) Create a GUI to show any one of the table contents(include data grid view and perform operations such as add, delete, modify etc).

3. a) Create table EMPLOYEE, PROJECT and WORKS_ON as per the following schema:

Identify the Primary and referential constraints on the table.

- i) Employee Table

Fname	Lname	Ssn	Bdate	Address	Sex	Salary	Super ssn	Dno
-------	-------	-----	-------	---------	-----	--------	--------------	-----

- ii) Project table

<u>P_name</u>	<u>Pno</u>	P_location
---------------	------------	------------

- iii) Works_On

<u>Essn</u>	<u>Pno</u>	Hours
-------------	------------	-------

- b) Insert records into the above tables.

- c) Queries to be executed

- Retrieve employee name, address and salary with all employee names first letter in capital.
- For each employee retrieve the total projects and total no. of hours he/she works on.
- Illustrate the use of Save point, Rollback and Commit transaction commands.

- d) Create a GUI to show any one of the table contents (include data grid view and perform operations such as add, delete, modify etc).

4. a). Create table BOOK, BOOK_BORROWED and BOOK_BORROWER as per the following schema: Identify the Primary and referential constraints on the table.

- i) Book

<u>Book_id</u>	Title	Publisher_name
----------------	-------	----------------

- ii) Book_Borrowed

<u>Book_id</u>	<u>Card_No</u>	Date_out	Due_Date
----------------	----------------	----------	----------

- iii) Book_Borrower

<u>Card_No</u>	Name	Address	Phone
----------------	------	---------	-------

- b) Insert records into the above tables.

- c) Queries to be executed

- Retrieve the names of people who have borrowed “Computer Network” book.
- Retrieve the number of days permitted to borrow “Computer Organization” by “Cherry”.
- Illustrate the use of any four numeric functions.

- d) Create a GUI to show any one of the table contents (include data grid view and perform operations such as add, delete, modify etc).

5. a) Create table CUSTOMER, ACCOUNT, LOAN as per the following schema: Identify the Primary and referential constraints on the table.

- i) Customer

<u>Account_no</u>	Name	Address	Phone
-------------------	------	---------	-------

ii) Account

<u>Account_no</u>	<u>Transaction_type</u>	Amount	Balance
-------------------	-------------------------	--------	---------

iv) Loan

<u>Loan_no</u>	<u>Account_no</u>	Amount	<u>Loan_type</u>	<u>Interest_rate</u>
----------------	-------------------	--------	------------------	----------------------

b) Insert records into the above tables.

c) Queries to be executed

- Retrieve all customers who have availed the loan amount of more than 5 lakhs.
- Create a view with the following attributes: Customer name, bank balance and loan amount.
- Illustrate the use of Grant and Revoke commands.

d) Create a GUI to show any one of the table contents (include data grid view and perform operations such as add, delete, modify etc).

6. a) Create table ART_OBJECT, PAINTING and STATUE as per the following schema:

Identify the Primary and referential constraints on the table.

i) Art object

<u>Id_no</u>	<u>Artist_Name</u>	<u>Year_Created</u>	Title	<u>Art_type</u>	Description
--------------	--------------------	---------------------	-------	-----------------	-------------

Art type can either Painting or Statue

ii) PAINTING

<u>Paint_type</u>	<u>Base_Material</u>	<u>Style</u>	Price
-------------------	----------------------	--------------	-------

Paint type can be oil or water colour or organic colour

Base material can be paper, canvas or wood

Style can be Modern or Abstract

iv) Statue

<u>Material_type</u>	<u>Height</u>	<u>Weight</u>	<u>Style</u>	Price
----------------------	---------------	---------------	--------------	-------

Material type can be stone, wood, glass

Style can be Modern or Abstract

b) Insert records into the above tables.

c) Queries to be executed

- Retrieve the details of the costliest painting using nested queries.
- Retrieve the names of the artist who have worked on Abstract style
- Delete all the records pertaining to the artist by name "Sahithya".

d) Create a GUI to show any one of the table contents (include data grid view and perform operations such as add, delete, modify etc).

