KAKATIYA UNIVERSITY
WARANGAL, TELANGANA

B.A and B.Sc (Life Sciences) with Computer Application Syllabus

Under the

CHOICE BASED CREDIT SYSTEM
(With effect from 2016-17)

DEPARTMENT OF COMPUTER SCIENCE
Kakatiya University, Warangal-506009

Department of Computer Science, Kakatiya University offers B.A and B.Sc. (Life Science) with computer application as core subjects at UG level (3 Year course) with six semesters with internal assessment for theory papers under Choice Based Credit System (CBCS) in University constituent and affiliated colleges for the students admitted in first year from 2016-17 academic year onwards.

1. Each of first four Semesters (i.e I, II III and IV) contains one theory core paper (20 marks for Internal Assessment and 80 marks for Semester End Exam equivalent to 4 credits) as Discipline Specific Course (DSC) and one practical paper (50 marks equivalent to 02 credits), whereas each of last two semesters (i.e V and VI) contains one theory core paper as DSC (15 marks for Internal Assessment and 60 marks for Semester End Exam equivalent to 3 credits), one theory elective paper as Discipline Specific Elective (DSE) (15 marks for Internal Assessment and 60 marks for Semester End Exam equivalent to 3 credits) and two practical papers (25 marks in each paper equivalent to 01 credit). For total six semesters in B.A and B.Sc. (Life Science) with computer application courses, the total marks are 1000 and credits are 40 for each.

2. Internal Assessment examination will be conducted twice in every Semester. Marks will be awarded from the average of the two Internal Assessment Exams in each Semester.

3. Scheme for CBCS, work-load for each paper, distribution of marks and credits; and scheme of question paper are attached herewith.

4. The syllabi of B.A and B.Sc. (Life Science) with computer application theory and practical papers of I, II, III, IV, V and VI semesters are enclosed

5. The practical examination will be conducted at the end of each semester. A minimum of 40% marks should be obtained by the student to pass the practical examination of both B.A and B.Sc. (Life Science) with computer application in all semesters.

6. All the theory papers and practical papers of both B.A and B.Sc. (Life Science) with computer application in I, II, III and IV semesters are common to all students. But, elective theory (DSE) papers of B.A and B.Sc. (Life Science) with computer application in V and VI Semesters are to be chosen by the student from the available options.

7. Elective (DSE) papers of B.A and B.Sc. (Life Science) with computer application will be offered separately at the beginning of Semesters V and VI. Every student has to choose one elective from the Electives being offered.

B.A and B.Sc. (Life Science) with Computer Application
CBCS pattern in Semester System (w. e. from 2016-2017)

Code	Semester	Course category	Title of the Paper	No. of Credits	HPW	Max. Marks			Total Marks
						I.A	End Exam	Total	
FIRST YEAR									
BS106	I	DSC-1A (Theory)	Computer Fundamentals	4	4	20	80	100	125
		DSC-1A (Practical)		1	2	-	25	25	
BS206	II	DSC-1B (Theory)	Computer Programming with C	4	4	20	80	100	125
		DSC-1B (Practical)		1	2	-	25	25	
SECOND YEAR									
BS306	III	DSC-1C (Theory)	Database Management System	4	4	20	80	100	125
		DSC-1C (Practical)		1	2	-	25	25	
BS406	IV	DSC-1D (Theory)	Internet Technologies	4	4	20	80	100	125
		DSC-1D (Practical)		1	2	-	25	25	
THRID YEAR									
BS505	V	DSC-1E (Theory)	Multimedia Systems and Applications	3	3	15	60	75	100
		DSC-1E (Practical)		1	2	-	25	25	
BS508		DSC-1E (Theory)	Elective 1 (A/B/C) **A)** Computer Networks **B)** Object Oriented Programming with C++ **C)** System programming	3	3	15	60	75	100
		DSC-1E (Practical)		1	2	-	25	25	
BS605	VI	DSC-1F (Theory)	Visual Programming	3	3	15	60	75	100
		DSC-1F (Practical)		1	2	-	25	25	
BS608		DSC-1F (Theory)	Elective 2 (A/B/C) **A)** Computer Graphics **B)** Software Engineering **C)** PHP Programming	3	3	15	60	75	100
		DSC-1F (Practical)		1	2	-	25	25	
Summary of Credits				36	-	-	-	-	900

Note: - Skill Enhancement Courses (SEC1, SEC2, SEC3 and SEC4) will be introduce later

Core 1: Computer Fundamentals

Unit – I

Introduction to Computer : Introduction, Digital and Analog Computers, Characteristics of Computer, History of Computer, Generations of Computer, Classification of Computer, The Computer System, Application of Computers.

The Computer System Hardware: Introduction, Central Processing Unit, Memory Unit, Instruction Format, Instruction Set, Instruction Cycle, Microprocessor, Interconnecting the Units of a Computer, Performance of a Computer, Inside a Computer Cabinet

Computer Memory : Introduction, Memory Representation, Memory Hierarchy, CPU Registers, Cache Memory, Primary Memory, Secondary Memory, Access Types of Storage Devices, Magnetic Tape, Magnetic Disk, Optical Disk, Magneto-Optical Disk, Using the Computer Memory.

Unit – II

Input and Output Devices: Introduction, Input-Output Unit, Input Devices, Human Data Entry Devices, Source Data Entry Devices, Output Devices, I/O Port, Working of I/O System.

Data Representation : Introduction, Number System, Conversion from Decimal to Binary, Octal, Hexadecimal, Conversion of Binary, Octal, Hexadecimal to Decimal , Conversion of Binary to Octal, Hexadecimal, Conversion of Octal, Hexadecimal to Binary, Binary Arithmetic, Signed and Unsigned Numbers, Binary Data Representation, Binary Coding Schemes, Logic Gates.

Interaction of User and Computer: Introduction, Types of Software, System Software, Application Software, Software Acquisition.

Unit – III

Operating System : Introduction, Objectives of Operating System, Types of OS, Functions of OS, Process Management, Memory Management, File Management, Device Management, Protection and Security, User Interface, Examples of Operating Systems.

Computer Programming Fundamentals: Introduction, Program Development Life Cycle, Algorithm, Control Structures, Flowchart, Pseudo Code, Programming Paradigms.

The Internet and Internet Services: Introduction, History of Internet, Internetworking Protocol, the Internet Architecture, Managing the Internet, Connecting to Internet, Internet Connections, Internet Address, Internet Services, Uses of Internet.

Unit IV

Information Systems : Introduction, Data, Information and Knowledge, Characteristics of Information, Information System (IS), Computer-Based Information System (CBIS), Need for Efficient Information System, Categories of Information System, Operations Support System, Management Support System, Specialized Information System, Careers in Information Systems.

Computer Security: Introduction, Security Threat and Security Attack, Malicious Software, Hacking, Security Services, Security Mechanisms, Cryptography, Digital Signature, Firewall, Users Identification and Authentication, Other

Security Measures, Security Awareness, Security Policy.

Emerging Computer Technologies: Distributed Networking, Peer-to-Peer Computing, Grid Computing, Cloud Computing, Utility Computing, On-demand Computing, Wireless Network, Bluetooth, and Artificial Intelligence.

Text Books:

1. A. Goel, Computer Fundamentals, Pearson Education, 2010.
2. Reema Thareja, Fundamentals of Computers, Oxford 2015.

References:

1. Spoken Tutorial on "Linux (Ubuntu), LibreOffice (Writer, Calc, Impress), Firefox", as E-resource for Learning. http://spoken-tutorial.org

<div align="center">**Practical: Computer Fundamentals**</div>

NOTE:

- All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.

- Faculty must take care about UG standard programs it should be minimum 25 – 30.

- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.

- External Viva-voce is compulsory.

Example programs:

The practical assignment must include connecting parts of a computer and assembling it to an extent, media formatting and installation of some software.

Practical exercises based on Open Office tools using document preparation and spreadsheet handling packages.

Text Editor

1. Prepare a grocery list having four columns (Serial number, The name of the product, quantity and price) for the month of April, 06.

   - Font specifications for Title (Grocery List): 14-point Arial font in bold and italics.

   - The headings of the columns should be in 12-point and bold.

   - The rest of the document should be in 10-point Times New Roman.

   - Leave a gap of 12-points after the title.

2. Create a telephone directory.

   - The heading should be 16-point Arial Font in bold

   - The rest of the document should use 10-point font size

   - Other headings should use 10-point Courier New Font.

   - The footer should show the page number as well as the date last updated.

3. Design a time-table form for your college.

   - The first line should mention the name of the college in 16-point Arial Font and should be bold.

   - The second line should give the course name/teacher's name and the department in14-point Arial.

   - Leave a gap of 12-points.

   - The rest of the document should use 10-point Times New Roman font.

   - The footer should contain your specifications as the designer and date of creation.

4. BPB Publications plans to release a new book designed as per your syllabus. Design the first page of the book as per the given specifications.

- The title of the book should appear in bold using 20-point Arial font.
- The name of the author and his qualifications should be in the center of the page in 16-point Arial font.
- At the bottom of the document should be the name of the publisher and address in 16-point Times New Roman.
- The details of the offices of the publisher (only location) should appear in the footer.

5. Create the following one page documents.

   a.   Compose a note inviting friends to a get-together at your house, Including a list of things to bring with them.

   b.   Design a certificate in landscape orientation with a border around the document.

   c.   Design a Garage Sale sign.

   d.   Make a sign outlining your rules for your bedroom at home, using a numbered list.

6. Create the following documents:

- A newsletter with a headline and 2 columns in portrait orientation, including at least one image surrounded by text.

- Use a newsletter format to promote upcoming projects or events in your classroom or college.

- Convert following text to a table, using comma as delimiter

- Type the following as shown (do not bold).

   Color, Style, Item

   Blue, A980, Van

   8Red, X023, Car

   Green, YL724, Truck

   Name, Age, Sex

   Bob, 23, M

   Linda, 46, F

   Tom, 29, M

7. Enter the following data into a table given on the next page.

Salesperson	Dolls	Trucks	Puzzles
Kennedy, Sally	1327	1423	1193
White, Pete	1421	3863	2934
Pillar, James	5214	3247	5467
York, George	2190	1278	1928

Banks, Jennifer	1201	2528	1203
Atwater, Kelly	4098	3079	2067

Add a column Region (values: S, N, N,S,S,S) between the Salesperson and Dolls columns to the given table Sort your table data by Region and within Region by Salesperson in ascending order:

In this exercise, you will add a new row to your table, place the word "Total" at the bottom of the Salesperson column, and sum the Dolls, Trucks, and Puzzles columns.

8. Wrapping of text around the image.

9. Create your resume by incorporating most of the options learned till now.

10. Following features of menu option must be covered

FILE	Complete menu
EDIT	Complete menu
VIEW	Complete menu
INSERT	Complete menu
FORMAT	Complete menu
TABLE	Complete menu
WINDOW	Complete menu
HELP	Complete menu

TOOLS   All options except Online collaboration, Tools on Macro, Templates

Spreadsheet

1. Enter the Following data in Excel Sheet

REGIONAL SALES PROJECTION

State	Qtr1	Qtr2	Qtr3	QTR4	Qtr Total	Rate	Amount
Delhi	2020	2400	2100	3000		15	
Punjab		1100	1300	1500	1400		20
U.P.	3000	3200	2600	2800		17	
Harayana	1800	2000	2200	2700		15	
Rajasthan	2100	2000	1800	2200		20	
TOTAL							
AVERAGE							

(a) Apply Formatting as follow:

    I. Title in TIMES NEW ROMAN

    ii. Font Size - 14

    iii. Remaining text - ARIAL, Font Size -10

iv. State names and Qtr. Heading Bold, Italic with Gray Fill Color.

    v. Numbers in two decimal places.

    vi. Qtr. Heading in center Alignment.

    Vii. Apply Border to whole data.

  (b) Calculate State and Qtr. Total

  (c) Calculate Average for each quarter

  (d) Calculate Amount = Rate * Total.

2. Given the following worksheet

	A	B	C	D
1	Roll No.	Name	Marks	Grade
2	1001	Sachin	99	
3	1002	Sehwag	65	
4	1003	Rahul	41	
5	1004	Sourav	89	
6	1005	Har Bhajan	56	

Calculate the grade of these students on the basis of following guidelines:

If Marks	Then Grade
>= 80	A+
10>= 60 < 80	A
>= 50 < 60	B
< 50	F

3. Given the following worksheet

A	B	C	D	E	F	G
1	Salesman	Sales in (Rs.)				
2	No.	Qtr1	Qtr2	Qtr3	Qtr4	Total Commission
3	S001	5000	8500	12000	9000	
4	S002	7000	4000	7500	11000	
5	S003	4000	9000	6500	8200	
6	S004	5500	6900	4500	0500	
7	S005	7400	8500	9200	8300	
8	S006	5300	7600	9800	6100	

Calculate the commission earned by the salesmen on the basis of following Candidates:

If Total Sales	Commission
< 20000	0% of sales
> 20000 and < 25000	4% of sales

> 25000 and < 30000   5.5% of sales

> 30000 and < 35000   8% of sales

>= 35000   11% of sales

The total sales is sum of sales of all the four quarters.

4. A company XYZ Ltd. pays a monthly salary to its employees which consists of basic salary, allowances & deductions. The details of allowances and deductions are as follows:

Allowances

• HRA Dependent on Basic

  30% of Basic if Basic <=1000

  25% of Basic if Basic>1000 & Basic<=3000

  20% of Basic if Basic >3000

• DA Fixed for all employees, 30% of Basic

• Conveyance Allowance

  Rs. 50/- if Basic is <=1000

  Rs. 75/- if Basic >1000 & Basic<=2000

  Rs. 100 if Basic >2000

•Entertainment Allowance NIL if Basic is <=1000

  Rs. 100/- if Basic > 1000

Deductions

• Provident Fund 6% of Basic

• Group Insurance Premium Rs. 40/- if Basic is <=1500

  Rs. 60/- if Basic > 1500 & Basic<=3000

  Rs. 80/- if Basic >3000

Calculate the following:

Gross Salary   = Basic + HRA + DA + Conveyance + Entertainment

Total deduction = Provident Fund + Group Insurance Premium

Net Salary   = Gross Salary – Total Deduction

5. Create Payment Table for a fixed Principal amount, variable rate of interests and time in the format below:

No. of Instalments	5%	6%	7%	8%	9%
3	XX	XX	XX	XX	XX
4	XX	XX	XX	XX	XX
5	XX	XX	XX	XX	XX
6	XX	XX	XX	XX	XX

6. Use an array formula to calculate Simple Interest for given principal amounts given the rate of Interest and time

Rate of Interest	8%
Time	5 Years
Principal	Simple Interest
1000	?
18000	?
5200	?

7. The following table gives year wise sale figure of five salesmen in Rs.

Salesman	2000	2001	2002	2003
S1	10000	12000	20000	50000
S2	15000	18000	50000	60000
S3	20000	22000	70000	70000
S4	30000	30000	100000	80000
S5	40000	45000	125000	90000

(a) Calculate total sale year wise.

(b) Calculate the net sale made by each salesman

(c) Calculate the maximum sale made by the salesman

(d) Calculate the commission for each salesman under the condition.

(i) If total sales >4,00,000 give 5% commission on total sale made by the salesman.

(ii) Otherwise give 2% commission.

(e) Draw a bar graph representing the sale made by each salesman.

(f) Draw a pie graph representing the sale made by salesman in 2000.

8. Enter the following data in Excel Sheet

PERSONAL BUDGET FOR FIRST QUARTER

Monthly Income (Net): 1,475

EXPENSES QUARTER	JAN	FEB	MARCH	QUARTER
			TOTAL	AVERAGE
Rent	600.00	600.00	600.00	
Telephone	48.25	43.50	60.00	
Utilities	67.27	110.00	70.00	
Credit Card	200.00	110.00	70.00	
Oil	100.00	150.00	90.00	
AV to Insurance	150.00			

Cable TV	40.75	40.75	40.75

Monthly Total

(a) Calculate Quarter total and Quarter average.

(b) Calculate Monthly total.

(c) Surplus = Monthly income - Monthly total.

(d) What would be total surplus if monthly income is 1500.

(e) How much does telephone expense for March differ from quarter average.

(f) Create a 3D column graph for telephone and utilities.

(g) Create a pie chart for monthly expenses.

9. Enter the following data in Excel Sheet

TOTAL REVENUE EARNED FOR SAM'S BOOKSTALL

Publisher name	1997	1998	1999	2000	total
A	Rs. 1,000.00	Rs. 1100.00	Rs. 1,300.00	Rs.800.00	
B	Rs. 1,500.00	Rs. 700.00	Rs. 1,000.00	Rs. 2,000.00	
C	Rs. 700.00	Rs. 900.00	Rs. 1,500.00	Rs.600.00	
D	Rs. 1,200.00	Rs. 500.00	Rs. 200.00	Rs. 1,100.00	
E	Rs 800.00	Rs. 1,000.00	Rs. 3,000.00	Rs.560.00	

(a) Compute the total revenue earned.

(b) Plot the line chart to compare the revenue of all publisher for 4 years.

(b) Chart Title should be 'Total Revenue of sam's Bookstall (1997-2000)'

(c) Give appropriate categories and value axis title.

10. Generate 25 random numbers between 0 & 100 and find their sum, average and count. How many no. are in range 50-60

Core 2: Computer Programming with C

Unit - I

Computing Concepts: Types of Software, Programming Languages, Translator Programs, Problem Solving Techniques, Using Computer.

Overview of C: History of C, Importance of C, Sample Programs, Basic Structure of C Programs, Programming Style, Executing a ' C ' Program.

Constants, Variables, and Data Types : Introduction, Character set, C tokens, Keywords and Identifiers, Constants, Variables, Data Types, Declaration of Variables, Declaration of Storage Class, Assigning Values to Variables, Defining Symbolic Constant, Declaring Variable as Constant and Volatile, Overlow and Underflow of Data.

Managing Input and Output Operations: Introduction, Reading a Character, Writing a Character, Formatted Input and Output.

Operators and Expressions : Introduction, Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operator, Conditional Operators, Bitwise Operators, Special Operators, Arithmetic Expressions, Evalution of expressions, Precedence of Arithmetic Operators, Some Computational Problems, Type Conversions in Expressions, Operator Precedence and Associativity, Mathematical Functions.

Unit – II

Decision Making and Branching: Introduction, Decision Making with IF Statement, Simple If Statement, The If....Else Statement, Nested of If....Else Statements, The else if Ladder, The Switch Statement, The?: Operator, The Goto Statement.

Decision Making and Looping: Introduction, The While statement, the do Statement, the For Statement, Jumps in Loops.

Arrays: Introduction, One-dimensional Arraays, Declaration and Initialization of One-dimensional Arrays, Two-dimensional Arrays, Initializing two-dimensional Arrays, Multi-dimensional Arrays, Dynamic Arrays.

Unit III

Character Arrays and Strings: Introduction, Declaring and Initializing String Variables, Reading Strings from Terminal, Writing Strings to Screen, Arithmetic Operations on Characters, Putting Strings together, Comparison of Two Strings, String-handling Functions, Table of Strings, Other Features of Strings.

User-Defined Functions : Introduction, Need for User-Defined Functions, A Multi-function Program, Elements of user-defined Functions, Definition of Functions, Return Valus and their Types, Function Calls, Function Declaration, Category of Functions, No Arguments and No Return Values, Arguments but No Return Values, Arguments with Return Values, No Arguments but Returns a Value, Functions that Return Multiple Values, Nesting of Functions, Recursion, Passing Arrays to Functions, Passing Strings to Functions, The Scope, Visibility and Lifetime of Variables, Multifile Programs.

Unit- IV

Pointers : Introduction, Understanding Pointers, Accessing the Address of a Variable, Decalring Pointer Variables, Initilization of pointer Variables, Accessing a Variable through its pointer, Chain of Pointers, Pointer Expressions, Pointer Increments and Scale Factor, Pointers and Arrays, Pointer and Arrays, Pointers and Character Strings, Arrays of Pointers, Pointers as Function Arguments, Functions Returning Pointers, Pointers to Functions, Pointers and Structures.

Structures and Unions : Introduction, Defining a Structure, Declaring Structure Variables, Accessing Structure Members, Structure Initialization, Copying and Comparing Structure Variables, Operations on Individuals Members, Arrays of Structures, Arrays within Structures, Structures within Structures, Structures and Functions, Unions, Size of Structures, Bit Fields.

File Management in C : Introduction, Defining and Opening a File, Closing a File, Input/Output Operations on Files, Error Handling During I/O Operations, Random Access to Files, Command Line Arguments.

Text Book:

1. Computing Fundamentals & C Programming – McGrawHill Education.

References:

1. Spoken Tutorial on "C", as E-resource for Learning. http://spoken-tutorial.org

Practical: Computer Programming with C

NOTE:

- All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.

- Faculty must take care about UG standard programs it should be minimum 25 – 30.

- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.

- External Viva-voce is compulsory.

Example programs:

1. Write a c program for electricity bill tacking different categories of users, diffrent slabs in each category.(using nested if else statement)

2. write a c program to evaluate the following using loops

    a. $1+x2/2!+x4/4!+...$upto 5 terms

    b. $x+x3/3!+x5/5!+...$upto 5 terms

3. Write a c program to check whether the given number is

    a. Prime or not

    b. Perfect or abundant or deficient

4. Write a c program to find the mean, mode, median, and variance of list of values by using one dimensional array

5. Write a menu driven program to read a list of numbers and perform the following operations

    a. Print the list

    b. Delete duplicates from the list

    c. Reverse the list

6. Write a program to read a list of numbers and search for given number using binary search algorithm and if found display its index otherwise display the message "element not found in the list" using functions

7. Write a menu driven program to read two matrices and compute their sum and product using functions

8. Write a menu driven program to read list of student names and perform the following operations using functions.

    a. To print list of names

    b. To sort them in ascending order

    c. To print the list after sorting

9. Write a c program that consists of recursive functions to find

    a. Factorial of a given number

    b. Print the pascal triangle using bionomial theorem

10. Write a menu driven program to read list of student names and perform the following operations using array of charecter pointers.

    a. To insert a student name

    b. To delete a name

    c. To print the names

Core 3: Database Management System

Unit 1

Introduction to Databases: Databases and Database Users, Introduction, Example, Characteristics of the Database Approach, Actors on the Scene, Workers behind the Scene, Advantages of Using the DBMS Approach, History of Database Applications, When Not to Use a DBMS.

Database System Concepts and Architecture: Data Models, Schemas, and Instances, Three-Schema Architecture and Data Independence, Database Languages and Interfaces, the Database System Environment, Centralized and Client/Server Architectures for DBMSs, Classification of Database Management Systems.

Data Models: Data Modelling and Data Models, the Importance of Data Models, Data Model Basic Building Blocks, Business Rules, the Evolution of Data Models, Degrees of Data Abstraction

Unit II

The Relational Database Model: Logical View of Data, Keys, Integrity Rules, Relational Set Operators, The Data Dictionary and the System Catalog, Relationships within the Relational Database, Data Redundancy Revisited, Indexes.

Entity Relationship (ER) Modelling: The Entity Relationship Model (ERM)- Entities , Attributes , Relationships , Connectivity and Cardinality , Existence Dependence , Relationship Strength , ,Weak Entities , Relationship Participation , Relationship Degree, Recursive Relationships, Associative (Composite) Entities; Developing an ER Diagram, Database Design Challenges: Conflicting Goals.

Unit III

ADVANCED DATA MODELING: The Extended Entity Relationship Model, Entity Clustering, Entity Integrity: Selecting Primary Keys.

Normalization of Database Tables: Database Tables and Normalization, The Need for Normalization, The Normalization Process, Improving the Design, Surrogate Key Considerations, Higher-Level Normal Forms, Normalization and Database Design, Denormalization.

Unit IV

Introduction to Structured Query Language (SQL): Introduction to SQL, Data Definition Commands, Data Manipulation Commands, SELECT Queries, Advanced Data Definition Commands, Advanced SELECT Queries, Virtual Tables: Creating a View, Joining Database Tables.

Advanced SQL: Relational Set Operators, SQL Join Operators, Subqueries and Correlated Queries, SQL Functions, Oracle Sequences, Updatable Views, Procedural SQL, Embedded SQL.

Text Books:

1. Peter Rob and Carlos Coronel, Database Systems: Design, Implementation, and Management, Thomson, Eighth Edition, 2009

2. R. Elmsasri,S. Navathe, Fundamentals of Database Systems, Pearson Education, sixth Edition, 2011

Book references:

1. MySQL : Reference Manual

2. Spoken Tutorial on "MySQL", as E-resource for Learning, http://spoken-tutorial.org

Practical: Database Management System

NOTE:

- All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.

- Faculty must take care about UG standard programs it should be minimum 25 – 30.

- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.

- External Viva-voce is compulsory.

Example programs:

1. Create a database having two tables with the specified fields, to computerize a library system of a Delhi University College.

   LibraryBooks (Accession number, Title, Author, Department, PurchaseDate, Price)

   IssuedBooks (Accession number, Borrower)

   a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.

   b) Delete the record of book titled "Database System Concepts".

   c) Change the Department of the book titled "Discrete Maths" to "CS".

   d) List all books that belong to "CS" department.

   e) List all books that belong to "CS" department and are written by author "Navathe".

   f) List all computer (Department="CS") that have been issued.

   g) List all books which have a price less than 500 or purchased between "01/01/1999" and "01/01/2004".

2. Create a database having three tables to store the details of students of Computer Department in your college.

   Personal information about Student (College roll number, Name of student, Date of birth, Address, Marks(rounded off to whole number) in percentage at 10 + 2, Phone number)

   Paper Details (Paper code, Name of the Paper)

   Student's Academic and Attendance details (College roll number, Paper code, Attendance, Marks in home examination).

   a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.

   b) Design a query that will return the records (from the second table) along with the name of student from the first table, related to students who have more than 75% attendance and more than 60% marks in paper 2.

c) List all students who live in "Delhi" and have marks greater than 60 in paper 1.

d) Find the total attendance and total marks obtained by each student.

e) List the name of student who has got the highest marks in paper 2.

3. Create the following tables and answer the queries given below:

Customer (CustID, email, Name, Phone, ReferrerID)

Bicycle (BicycleID, DatePurchased, Color, CustID, ModelNo)

BicycleModel (ModelNo, Manufacturer, Style)

Service (StartDate, BicycleID, EndDate)

a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.

b) List all the customers who have the bicycles manufactured by manufacturer "Honda".

c) List the bicycles purchased by the customers who have been referred by customer "C1".

d) List the manufacturer of red colored bicycles.

e) List the models of the bicycles given for service.

4. Create the following tables, enter at least 5 records in each table and answer the queries given below.

EMPLOYEE (Person_Name, Street, City)

WORKS (Person_Name, Company_Name, Salary)

COMPANY (Company_Name, City)

MANAGES (Person_Name, Manager_Name)

1. Identify primary and foreign keys.

2. Alter table employee, add a column "email" of type varchar(20).

3. Find the name of all managers who work for both Samba Bank and NCB Bank.

4. Find the names, street address and cities of residence and salary of all employees who work for "Samba Bank" and earn more than $10,000.

5. Find the names of all employees who live in the same city as the company for which they work.

6. Find the highest salary, lowest salary and average salary paid by each company.

7. Find the sum of salary and number of employees in each company.

8. Find the name of the company that pays highest salary.

5. Create the following tables, enter at least 5 records in each table and answer the queries given below.

Suppliers (SNo, Sname, Status, SCity)

Parts (PNo, Pname, Colour, Weight, City)

Project (JNo, Jname, Jcity)

Shipment (Sno, Pno, Jno, Qunatity)

a) Identify primary and foreign keys.

b) Get supplier numbers for suppliers in Paris with status>20.

c) Get suppliers details for suppliers who supply part P2. Display the supplier list in increasing order of supplier numbers.

d) Get suppliers names for suppliers who do not supply part P2.

e) For each shipment get full shipment details, including total shipment weights.

f) Get all the shipments where the quantity is in the range 300 to 750 inclusive.

g) Get part nos. for parts that either weigh more than 16 pounds or are supplied by suppliers S2, or both.

h) Get the names of cities that store more than five red parts.

i) Get full details of parts supplied by a supplier in Delhi.

j) Get part numbers for part supplied by a supplier in Allahabad to a project in Chennai.

k) Get the total number of project supplied by a supplier (say, S1).

l) Get the total quantity of a part (say, P1) supplied by a supplier (say, S1).

Core 4: Internet Technologies

Unit – I

HTML- Basic HML, The document body, Text, Hyperlinks, Adding More Formatting, Lists, Using Color and Images, Images, Tables, Frames, Forms- Toward Interactivity .

Cascading Stylesheets - Introduction, Inline Styles, Embedded Style Sheets, Linking external sheets, Backgrounds, text flow and box model.

Unit - II

JavaScript- Introduction, simple programming, Obtaining User Input with prompt Dialogs, Operators (arithmetic, Decision making, assignment, logical, increment and decrement). Control Structures - if... else selection statement, while, do... while repetitions statement, for statement, switch statement, break and continue statements.

Functions - program modules in JavaScript, programmer defined functions, function definition, Random-number generator, scope rules, global functions, recursion,

Unit – III

JavaScript: Arrays, Objects - Math Object, String Object, Date Object, Boolean & Number Object, document and window Objects. Event Model - on click, on load, on error, onmouseover, onmouseout, on focus, on blur, on submit, on reset, more DHTML events.

Unit - IV

Introduction, XML Basics, Structuring Data, XML Namespaces, Document Type Definitions (DTDs), W3C XML Schema Documents, XML Vocabularies, Math, Other Markup Languages, and Extensible Style sheet Language and XSL Transformations, Document Object Model (DOM).

Text books:

1. Internet& World Wide Web- H. M. Deitel, P.J. Deitel, A. B. Goldberg-Third Edition

References:

1. D.R. Brooks, An Introduction to HTML and Javascript for Scientists and Engineers, Springer

2. URL: www.wekipedia.org

3. HTML A Beginner's Guide, Tata McGraw-Hill Education, 2009.

4. J. A. Ramalho, Learn Advanced HTML 4.0 with DHTML, BPB Publications, 2007

Practical: Internet Technologies

NOTE:

- All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.

- Faculty must take care about UG standard programs it should be minimum 25 – 30.

- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.

- External Viva-voce is compulsory.

Example programs:

Practical exercises based on concepts listed in theory using HTML.

1. Create HTML document with following formatting – Bold, Italics, Underline, Colors, Headings, Title, Font and Font Width, Background, Paragraph, Line Brakes, Horizontal Line, Blinking text as well as marquee text.

2. Create HTML document with Ordered and Unordered lists, Inserting Images, Internal and External linking

3. Create HTML document with Table:

			Some image here	

4. Create Form with Input Type, Select and Text Area in HTML.

5. Create an HTML containing Roll No., student's name and Grades in a tabular form.

6. Create an HTML document (having two frames) which will appear as follows:

About department	
Department1	This frame would show the
Department1	contents according to the link
Department1	clicked by the user on the left
	Frame.

7. Create an HTML document containing horizontal frames as follows:

Department Names (could be along with Logos)
Contents according to the Link clicked

8. Create a website of 6 – 7 pages with different effects as mentioned in above problems.

9. Create HTML documents (having multiple frames) in the following three formats:

rame1
ame2

Frame1	
Frame 2	Frame 3

10. Create a form using HTML which has the following types of controls:

I. Text Box

II. Option/radio buttons

III. Check boxes

IV. Reset and Submit buttons

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● Here on the Web ○ In a magazine ○ Television ○ Other
Would you like to be on our regular mailing list?
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11. Create a student Bio-Data, using forms.

12. Create a web page using following style sheets

i. Inline style sheets. ii. Embedded style sheets. iii. External style sheets

13. Create a web page using "class" style sheets with different "border-width" property values like thick, medium, thin, grove, inset, and outset, red & blue.

JavaScript:

Create event driven program for following:

1. Print a table of numbers from 5 to 15 and their squares and cubes using alert.

2. Print the largest of three numbers.

3. Find the factorial of a number n.

4. Enter a list of positive numbers terminated by Zero. Find the sum and average of these numbers.

5. A person deposits Rs 1000 in a fixed account yielding 5% interest. Compute the amount in the account at the end of each year for n years.

6. Read n numbers. Count the number of negative numbers, positive numbers and zeros in the list.

7. Write a JavaScript program to accept two values from form and apply any 5 mathematical functions.

8. Display the current date and time in both GMT and local form.

9. Write a JavaScript program on MouseOver, MouseOut, blur events.

10. Write a XML program using document type definitions

11. Write Student database with XML.

12. Write a XML program using XS

Core 5: Multimedia Systems and Applications

Unit I

Multimedia: Introduction, Definitions, Where to Use Multimedia- Multimedia in Business, Schools, Home, Public Places, Virtual Reality; Delivering Multimedia.

Text: Meaning, Fonts and Faces, Using Text in Multimedia, Computers and Text, Font Editing and Design Tools, Hypermedia and Hypertext.

Images: Before You Start to Create, Making Still Images, Color.

Unit II

Sound: The Power of Sound, Digital Audio, MIDI Audio, MIDI vs. Digital Audio, Multimedia System Sounds, Audio File Formats. Adding Sound to Your Multimedia Project.

Animation: The Power of Motion, Principles of Animation, Animation by Computer, Making Animations.

Video: Using Video, How Video Works and Is Displayed, Digital Video Containers, Obtaining Video Clips, Shooting and Editing Video.

Unit III

Making Multimedia: The Stages of a Multimedia Project, the Intangibles, Hardware, Software, Authoring Systems

The Internet and Multimedia: Internet History, Internetworking, Multimedia on the Web.

Designing for the World Wide Web: Developing for the Web, Text for the Web, Images for the Web, Sound for the Web, Animation for the Web, Video for the Web.

Text book:

1. Tay Vaughan, "Multimedia: Making it work", TMH, Eighth edition.

Reference books:

1. Ralf Steinmetz and Klara Naharstedt, "Multimedia: Computing, Communications Applications", Pearson.
2. Keyes, "Multimedia Handbook", TMH.
3. K. Andleigh and K. Thakkar, "Multimedia System Design", PHI.
4. Spoken Tutorial on "Blender, GIMP, Inkscape", as E-resource for Learning. http://spoken-tutorial.org

Practical: Multimedia Systems and Applications

NOTE:

- All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.

- Faculty must take care about UG standard programs it should be minimum 25 – 30.

- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.

- External Viva-voce is compulsory.

Example programs:

Practical exercises based on concepts listed in theory using Presentation tools in office automation tool/ GIMP/Blender / Audacity/ Animation Tools/ Image Editors/ Video Editors.

Implement the followings using Blender -

1. Create an animation using the tools panel and the properties panel to draw the following – Line, pe , oval, circle, rectangle , square, pencil , brush , lasso tool

2. Create an animation using text tool to set the font , size , color etc.

3. Create an animation using **Free transform tool** that should use followings-

    Move Objects

    Skew Objects

    Stretch Objects

    Rotate Objects

    Stretch Objects while maintaining proportion

    Rotate Objects after relocating the center dot

4. Create an animation using layers having following features-

    Insert layer, Delete layer, guide layer, Mask layer.

5. Modify the document (changing background color etc.)Using the following tools

    Eraser tool

    Hand tool

    Ink bottle tool

    Zoom tool

    Paint Bucket tool

    Eyedropper tool

6. Create an animation for bus car race in which both starts from the same point and car wins the race.

7. Create an animation in which text Hello gets converted into GoodBye (using motion/shape tweening).

8. Create an animation having five images having fade-in fade-out effect.

9. Create an scene to show the sunrise (using multiple layers and motion tweening)

10.   Create an animation to show the ripple effect.

11.   Create an animation (using Shape tweening and shape hints) for transforming one shape into another.

12.   Create an animation for bouncing ball (you may use motion guide layer).

Core 6: Visual Programming

Unit I

Introduction to VB: Writing windows application with VB, Programming languages -procedural, object oriented, event driven; VB Environment, Writing first VB project, compiling, debugging, and running the programs.

Controls : Introduction to controls textboxes, frames, check boxes, option buttons, images, setting borders and styles, the shape control, the line control, working with multiple controls and their properties, designing the user interface, keyboard access, tab controls, default & cancel property, coding for controls.

Variables, constants, and Calculation: Data types, naming rules and conversion, constants-named and intrinsic, declaring variables, scope of variables, val function, arithmetic operations, formatting data Counting and accumulating Sums.

Unit II

Decisions and Conditions : If statement, Conditions-comparing numeric variables and constants, comparing strings, compound conditions (and, or, not), nested if statements, using if statements with option buttons & check boxes, displaying message in message box, input validation. Calling event procedures, debugging VB projects, Debugging Step-by-Step Tutorial.

Modular programming: Menus, using common dialog box, writing general procedure.

Forms Handling : Multiple forms, creating, adding, removing forms, hide, show method, load, unload statement, me keyword, referring to objects on a different forms, Variables and constants in Multiple-Forms.

Iteration Handling: Lists Boxes and Combo Boxes, Do/loops, for/next loops, using msgbox function, using string function

Unit III

Arrays: control Arrays, the case structure, single-dimension arrays, for Each/Next statement, table lookup, using list boxes with array, multidimensional arrays.

Database Connectivity: VB and database, using the data control, viewing a database file- step-by-step, Navigating the Database in code, using list boxes and comboboxes as data-bound controls, adding a lookup table and navigation-step-by-step, updating a database file, Recordsets, working with database fields, creating a new Dynaset.

Advanced topics in VB: ActiveX controls, Dynamic link libraries (DLL), Multiple Document interface (MDI).

Text Book:

1. Programming in Visual Basic 6.0 by Julia Case Bradley, Anita C. Millispangh (Tata Mcgraw Hill Edition 2000 (Fourteenth Reprint 2004))

Practical: Visual Programming

NOTE:

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- Faculty must take care about UG standard programs it should be minimum 25 – 30.

- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.

- External Viva-voce is compulsory.

Example programs:

Note: - Use any open source alternative such as Tkinter with Python SharpDevelop/GAMBAS/OPENXAVA with JAVA

1. Print a table of numbers from 5 to 15 and their squares and Cubes.

2. Print the largest of three numbers.

3. Find the factional of a number n.

4. Enter a list of positive numbers terminated by zero. Find the sum and average of these numbers.

5. A person deposits Rs. 1000 in a fixed account yielding 5% interest. Complete the amount in the account at the end of each year for n years.

6. Read n numbers. Count the number of negative numbers, positive numbers and zeros in the list.

7. Read n numbers. Count the number of negative numbers, positive numbers and zeroes in the list.use arrays.

8. Read a single dimension array. Find the sum and average of these numbers.

9. Read a two dimension array. Find the sum of two 2D Array.

10. Create a database Employee and Make a form to allow data entry to **Employee Form** with the following command buttons:

Employee Form

Employee Name [＿＿＿＿＿＿＿]

Employee Id: [＿＿＿＿＿＿＿]

Date of Joining [＿＿＿＿＿＿＿]

Designation: [＿＿＿＿＿＿＿]

Department: [＿＿＿＿＿＿＿]

Address: [＿＿＿＿＿＿＿]

Basic Pay: [＿＿＿＿＿＿＿]

| PREV | NEXT | FIRST | LAST | ADD | SAVE | DELETE | CANCEL |

Elective1.A: Computer Networks

Unit I

Introduction: data communication- components, Networks, Protocols and Standards, Line configuration, topology, transmission mode, categories of networks.

OSI and TCP/IP Models: Layers and their functions, comparison of models.

Multiplexing: Many To One/One To Many, Frequency-Division Multiplexing (FDM), Wave-Division Multiplexing (WDM), Time-Division Multiplexing (TDM),

Unit II

Error Detection and Correction: Types of Errors, Detection, Vertical Redundancy Check (VRC), Longitudinal Redundancy Check (LRC), Cyclic Redundancy Check (CRC), Checksum, Error Correction.

Data Link Control: Line Discipline, Flow Control, Error Control, Asynchronous Protocols, Synchronous Protocols, Character-Oriented Protocols, Bit-Oriented Protocols, Link Access Procedures

Switching: Circuit Switching, Packet Switching, Message Switching.

Unit III

Transport Layer: Duties of the Transport Layer, Connection, the OSI Transport Protocol.

Upper OSI Layers: Session Layer, Presentation Layer, Application Layer.

TCP/IP Protocol Suite: Overview of TCP/IP, Network Layer, Addressing, Subnetting, Other Protocols In The Network Layer, Transport Layer

Text Book:

1. Behrouz A. Forouzan, *Data Communication and Networking*, 2nd Ed., Tata McGraw Hill.

Books Recommended

1. A.S. Tenanbaum, *Computer Networks*, 4th Ed., Pearson Education Asia, 2003.
2. D. E. Comer, *Internetworking with TCP/IP*, Pearson Education Asia, 2001.
3. William Stallings, *Data and Computer Communications*, 7th Ed., Pearson education Asia, 2002.

Practical: Computer Networks

NOTE:

- All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.

- Faculty must take care about UG standard programs it should be minimum 25 – 30.

- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.

- External Viva-voce is compulsory.

Example programs:

Simulation Exercises: The following experiments shall be conducted using either NS2/NS3/OPNET or any other simulators.

1. Simulate a three nodes point-to-point network with duplex links between them. Set the queue size vary the bandwidth and find the number of packets dropped.

2. Simulate a four node point-to-point network, and connect the links as follows: n0- n2, n1-n2 and n2-n3. Apply TCP agent between n0-n3 and UDP n1-n3. Apply relevant applications over TCP and UDP agents changing the parameter and determine the number of packets by TCP/UDP.

3. Simulate the different types of Internet traffic such as FTP a TELNET over a network and analyze the throughput.

4. Simulate the transmission of ping messaged over a network topology consisting of 6 nodes and find the number of packets dropped due to congestion.

5. Simulate an Ethernet LAN using N-nodes (6-10), change error rate and data rate and compare the throughput.

6. Simulate an Ethernet LAN using N nodes and set multiple traffic nodes and determine collision across different nodes.

7. Simulate an Ethernet LAN using N nodes and set multiple traffic nodes and plot congestion window for different source/destination.

8. Simulate simple ESS and with transmitting nodes in wire-less LAN by simulation and determine the performance with respect to transmission of packets.

Elective 1.B: Object Oriented Programming with C++

Unit I

Object-Oriented Paradigm, Data types, Operators and Expressions, Control Flows

Unit II

Arrays and Strings, Modular Programming with Functions, Pointers and runtime Binding, Structures and Unions.

Unit III

Classes and Objects, inheritance, virtual functions, Exception Handling,

Text Book:

1. K R Venugopal, Rajkumar Buyya, Mastering in C++, McGrawHill, 2nd Edition, 2013.

Reference:

1. Spoken Tutorial on "C++", as E-resource for Learning. http://spoken-tutorial.org

Practical: Object Oriented Programming with C++

NOTE:

- All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.

- Faculty must take care about UG standard programs it should be minimum 25 – 30.

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Example programs:

1) Write a program to test Arithmetic operators.

2) Write a program to Swap two numbers.

3) Write a program to demonstrate Switch statement.

4) Write a program to find roots of a quadratic equation.

5) Write a program to check whether the given number is palindrome or not.

6) Write a program to convert binary number to decimal number.

7) Write a program to print the following format.

    1

    2   3

    4   5   6

    7   8   9   10

8) Write a program to search an element in a given list.

9) Write a program to perform addition of two Matrices.

10) Write a program to perform multiplication of two Matrices.

11) Write a program to find factorial of a given number using recursion.

12) Write a program to demonstrate Pointer arithmetic

13) Write a program to demonstrate Call-By-Value, Call-By-Address,Call-By-Reference.

14) Write a program to demonstrate Structure data type.

15) Write a program to demonstrate Enumerated data type.

16) Write a program to demonstrate inline functions.

17) Write a program to demonstrate Function Overloading.

18) Write a c++ program to demonstrate Class concept.

19) Write a c++ program on Constructor overloading.

20) Write a c++ program on Destructor.

21) Write a c++ program for copy constructor.

22) Write a c++ program to demonstrate Friend function.

23) Write a c++ program for Unary operator overloading (Friend function/Member function).

24) Write a c++ program for Binary operator overloading (Friend function/Member function).

25) Write a c++ program for Member Function overloading within a class

26) Write a c++ program for Single and Multilevel Inheritance.

27) Write a c++ program for Overriding of member functions.

28) Write a c++ program to demonstrate constructor calling mechanism in inheritance.

29) Write a c++ program for Multiple and Hybrid inheritance.

30) Write a c++ program to demonstrate pure virtual function implementation.

Elective 1.C: System Programming

Unit I

Computer Hardware And System Software: Introduction, Computer Hardware and Types of System Software, Man-machine Communication Spectrum.

INTRODUCTION TO COMPILERS: Introduction, Theory of Computer Languages, Design of a Language, Evolution of Compilers, Stages of Compilation.

Unit II

LEXICAL ANALYSIS: Introduction, Alphabets and Tokens in Computer Languages, Representation of Tokens and Regular Expression, Token Recognition and Finite State Automata, Lexical Analysis Tool

SYNTAX ANALYSIS: Introduction, Context-free Grammar and Structure of Language, Parser and its Types, Top-down Parser, Bottom-up Parser, Parser Generator Tool (Yacc),

Unit III

INTERMEDIATE CODE GENERATION: Introduction, Need for Intermediate Code, Types of Intermediate Code, Semantic Analysis.

OPTIMIZATION: Introduction, Hints on Writing Optimized Code at User Level, Construction of Basic Blocks and Processing.

CODE GENERATION: Introduction, Issues in Code Generation, Target Machine Architecture

COMPILER WRITING TOOLS: Introduction, Lexical Tools, Syntactic Tools,

Test Book:

1. K. Muneeswaran, Compiler Design (with CD), Oxford university press, 2012

Reference Books

1. Santanu Chattopadhyaya, Systems Programming, PHI, 2011.
2. Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, Compilers: Principles, Techniques, and Tools, 2nd edition, Prentice Hall, 2006.
3. D. M. Dhamdhere, Systems Programming, Tata McGraw Hill, 2011.
4. Leland Beck, D. Manjula, System Software: An Introduction to System Programming, 3rd edition, Pearson Education, 2008.
5. Grune D, Van Reeuwijk . K, Bal H. E, Jacobs C J H, Langendoen K, Modern Compiler Design, 2nd edition, Springer, 2012

Practical: Systems Programming

NOTE:

- All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.

- Faculty must take care about UG standard programs it should be minimum 25 – 30.

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- External Viva-voce is compulsory.

Example programs:

1. To implement an assembler for a hypothetical language.
2. To get familiar with lex: write a program to recognize numbers, identifiers.
3. To get familiar with yacc: write a desk calculator.
4. Implement a symbol table with functions to create, insert, modify, search, and display.
5. Implement pass one of a two pass assembler.
6. Implement pass two of a two pass assembler.
7. Implement a single pass assembler.
8. Implement a two pass macro processor
9. Implement a single pass macro processor.
10. Implement an absolute loader.
11. Implement a relocating loader.
12. Implement pass one of a direct-linking loader.
13. Implement pass two of a direct-linking loader.
14. Implement a simple text editor with features like insertion / deletion of a character, word, and sentence.
15. Implement a symbol table with suitable hashing

Elective2.A: Computer Graphics

Unit I

Computer Graphics: Graphs and Charts, Computer-Aided Design, Virtual-Reality Environments, Data Visualizations, Education and Training, Computer Art, Entertainment, Image Processing, Graphical User Interfaces.

Computer Graphics Hardware: Video Display Devices, Raster-Scan System, GraphicsWorkstations and Viewing Systems, Input Devices, Hard-Copy Devices, Graphics Networks, Graphics on the Internet.

Computer Graphics Software: Coordinate Representations, Graphics Functions, Software Standards, Other Graphics Packages, Introduction to OpenGL.

Unit II

Graphics Output Primitives: Coordinate Reference Frames, Specifying A Two-Dimensional World-Coordinate Reference Frame in OpenGL, OpenGL Point Functions, OpenGL Line Functions, OpenGL Curve Functions, Fill-Area Primitives, Polygon Fill Areas, OpenGL Polygon Fill-Area Functions, OpenGL Vertex Arrays, Pixel-Array Primitives, OpenGL Pixel-Array Functions, Character Primitives, OpenGL Character Functions, Picture Partitioning, OpenGL Display Lists, OpenGL Display-Window Reshape Function.

Attributes of Graphics Primitives: OpenGL State Variables, Color and Grayscale, OpenGL Color Functions, Point Attributes, OpenGL Point-Attribute Functions, Line Attributes, OpenGL Line-Attribute Functions, Curve Attributes, Fill-Area Attributes, OpenGL Fill-Area Attribute Functions, Character Attributes, OpenGL Character-Attribute Functions, openGL Antialiasing Functions, OpenGL Query Functions, OpenGL Attribute Groups.

Algorithms for Graphics Primitives and Attributes: Line-Drawing Algorithms, Circle-Generating Algorithms, Ellipse-Generating Algorithms.

Unit III

Two-Dimensional Geometric Transformations: Basic Two-Dimensional Geometric Transformations, Matrix Representations, Inverse Transformations, Two-Dimensional Composite Transformations, Raster Methods for Geometric Transformations, OpenGL Raster Transformations, Transformations between Two-Dimensional Coordinate Systems, OpenGL Functions for Two-Dimensional Geometric Transformations.

Two-Dimensional Viewing: The Two-Dimensional Viewing Pipeline, The ClippingWindow, Normalization and Viewport Transformations, OpenGL Two-Dimensional Viewing Functions, Clipping Algorithms, Two-Dimensional Point Clipping, Two-Dimensional Line Clipping, Polygon Fill-Area Clipping, Curve Clipping, Text Clipping.

Text Book:

1. Donald D. Hearn, M. Pauline Baker, Warren Carithers "Computer Graphics with Open GL" 4th Edition, 2011.

References:

1. J.D. Foley, A van Dam, S.K. Feiner and J.F. Hughes, *Computer Graphics: Principals and Practices,* 2nd Ed., Addison-Wesley, MA, 1990.

2. D.F. Rogers, *Procedural Elements in Computer Graphics,* 2nd Ed., McGraw Hill Book Company, 2001.

3. D.F. Rogers and A.J. Admas, *Mathematical Elements in Computer Graphics*, 2nd Ed., McGraw Hill Book Company, 1990.

Practical: Computer graphics

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- External Viva-voce is compulsory.

Example programs:

1. Program to recursively subdivide a tetrahedron to from 3D Sierpinski gasket. The number of recursive steps is to be specified by the user.

2. Program to implement Liang-Barsky line clipping algorithm.

3. Program to draw a color cube and spin it using OpenGL transformation matrices.

4. Program to create a house like figure and rotate it about a given fixed point using OpenGL functions.

5. Program to implement the Cohen-Sutherland line-clipping algorithm. Make provision to specify the input line, window for clipping and view port for displaying the clipped image.

6. Program to create a cylinder and a parallel piped by extruding a circle and quadrilateral respectively. Allow the user to specify the circle and quadrilateral.

7. Program using OpenGL functions, to draw a simple shaded scene consisting of a tea pot on a table. Define suitably the position and properties of the light source along with the properties of the surfaces of the solid object used in the scene.

8. Program to draw a color cube and allow the user to move the camera suitably to experiment with perspective viewing. Use OpenGL functions.

9. Program to fill any given polygon using scan-line area filling algorithm. (Use appropriate data structures.)

10. Program to display a set of values {fij} as a rectangular mesh.

Elective 2.B: Software Engineering

Unit I

Introduction: The Evolving Role of Software, Software, Software Myths.

PROCESS: Software Engineering: A Layered Technology, the Software Process, Software Process Models, the Linear Sequential Model, the Prototyping Model, the RAD Model Evolutionary Software Process Models, Component-Based Development, The Formal Methods Model, Fourth Generation Techniques, Process Technology, Product and Process.

Unit II

PROJECT MANAGEMENT: The Management Spectrum, People, The Product, The Process, The Project, The W5HH Principle.

RISK ANALYSIS AND MANAGEMENT: Reactive versus Proactive Risk Strategies, Software Risks, Risk Identification, Risk Projection, Risk Refinement, Risk Mitigation, Monitoring, and Management.

Unit III

SOFTWARE TESTING TECHNIQUES: Software Testing Fundamentals, Test Case Design, White-Box Testing, Basis Path Testing, Control Structure Testing, Black-Box Testing, Testing for Specialized Environments, Architectures, and Applications.

SOFTWARE TESTING STRATEGIES: A Strategic Approach to Software Testing, Strategic Issues, integration Testing, Unit Testing, Validation Testing, System Testing,

Text book:

1. Roger S. Pressman ,Software Engineering (Sixth edition) , Tata McGraw Hill,2009

Practical: Software Engineering

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- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.

- External Viva-voce is compulsory.

Example programs:

Practical exercises based on concepts listed in Software Testing theory.

1. Write a program that take three inputs (a,b &c) that represent the sides of a triangle, and the output is one of the below four:

   a. Not a triangle

   b. Scalene triangle

   c. Isosceles triangle

   d. Equilateral triangle

   1.1 Generate test cases using Boundary Value Analysis, Equivalence Class Partitioning and Decision Table Testing.

   1.2 Generate test cases using Basis path testing.

   1.3 Run code coverage tool.

2. Write a program that determines the nature of roots of a quadratic equation. Output should be one of the following:-

   • Not a quadratic equation.

   • Complex roots

   • Real roots

   • Single roots

   I. Generate test cases using Boundary Value Analysis, Equivalence Class Partitioning and Decision Table Testing.

   II. Generate test cases using Basis path testing.

   III. Run code coverage tool

3. Write a program that checks whether the number is even or odd. Run code coverage tool and find the amount of code being covered.

4. Write a program that dynamically allocates memory to10 integers using malloc() or calloc() and

   • donot free memory leading to memory leaks. Verify the same usingValgrind.

   • Now, free memory using free() at the end of the program to avoid memory leaks. Verify the same using Valgrind.

Elective 2.C: PHP Programming

Unit I

Introducing PHP: History, Unique Features, Basic Development Concepts, Creating Your First PHP Script, Mixing PHP with HTML, Sample Applications.

Using Variables and Operators: Storing Data in Variables, Understanding PHP's Data Types, Setting and Checking Variable Data Types, Using Constants, Manipulating Variables with Operators.

Unit II

Controlling Program Flow: Writing Simple and Complex Conditional Statements, Repeating Actions with Loops, Working with String and Numeric Functions,

Working with Arrays: Storing Data in Arrays, Processing Arrays with Loops and Iterators, Using Arrays with Forms, Working with Array Functions, Working with Dates and Times.

Unit III

Using Functions and Classes: Creating User-Defined Functions, Creating Classes, Using Advanced OOP Concepts.

Working with Databases and SQL: Introducing Databases and SQL, Creating and Populating a Database, Using PHP's MySQLi Extension, Adding or Modifying Data, Handling Errors, Using PHP's SQLite Extension. Using PHP's PDO Extension, Building a Login Form.

Text book:

1. Vikram Vaswani, PHP: A Beginner's Guide(5.3), The McGraw-Hill, 2009

Reference Books:

1. Steven Holzner, "PHP: The Complete Reference Paperback", McGraw Hill Education (India), 2007.

2. Timothy Boronczyk, Martin E. Psinas, "PHP and MYSQL (Create-Modify-Reuse)", Wiley India Private Limited, 2008.

3. Robin Nixon, "Learning PHP, MySQL, JavaScript, CSS & HTML5", 3rd Edition Paperback, O'reilly, 2014.

4. Luke Welling, Laura Thompson, PHP and MySQL Web Development", 4th Edition, Addition Paperback, Addison-Wesley Professsional,2008.

5. David Sklar, Adam Trachtenberg, "PHP Cookbook: Solutions & Examples for PHP Programmers", 2014.

6. Spoken Tutorial on "PHP", as E-resource for Learning. http://spoken-tutorial.org

Practical: PHP programming

NOTE:

- All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.

- Faculty must take care about UG standard programs it should be minimum 25 – 30.

- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.

- External Viva-voce is compulsory.

Example programs:

1. Create a PHP page using functions for comparing three integers and print the largest number.

2. Write a function to calculate the factorial of a number (non-negative integer). The function accept the number as an argument.

3. WAP to check whether the given number is prime or not.

4. Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string.

5. Write a PHP function that checks if a string is all lower case.

6. Write a PHP script that checks whether a passed string is palindrome or not? (A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run)

7. WAP to sort an array.

8. Write a PHP script that removes the whitespaces from a string. Sample string : 'The quick " " brown fox' Expected Output : Thequick""brownfox

9. Write a PHP script that finds out the sum of first n odd numbers.

10. Create a login page having user name and password. On clicking submit, a welcome message should be displayed if the user is already registered (i.e.name is present in the database) otherwise error message should be displayed.

11. Write a PHP script that checks if a string contains another string.

12. Create a simple 'birthday countdown' script, the script will count the number of days between current day and birth day.

13. Write a simple PHP program to check that emails are valid.

14. WAP to print first n even numbers.

15. Write a PHP program to print Fibonacci series using recursion.

16. Write a PHP script to replace the first 'the' of the following string with 'That'.

17. Using switch case and dropdown list display a —Hello‖ message depending on the language selected in drop down list.

18. Create a script to construct the following pattern, using nested for loop.

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