ASSESSMENT RUBRICS

Refer to section 7 of FYIMP- Computational Science - Scheme and Syllabus for the 4 credit courses with 2 Credit Theory + 2 Credit Practical.

Sample Questions

1. Define algorithms ?
2. Discuss various characteristics of Algorithms ?
3. Explain flowchart and it symbols?
4. Draw flowcharts swapping two number with using an additional variable and without using additional variable
5. Write a program to illustrate the use of if-else statement
6. Explain nested-if statement
7. Compare between if-else and else-if ladder
8. Explain various methods for iteration
9. Explain switch case statement
10. Write a program to generate the series 1, 2, 4, 7, 11, 16……..
11. What is function and how function is called
12. What is direct memory accessing,
13. Define pointers
14. Explain various file operations.

Semester II

KU2DSCCSE102   FOUNDATIONS OF COMPUTER SCIENCE

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
1	DSC	100	KU2DSCCSE102	4	90

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
2	4	1	50	50	100	2(T)+3(P)*

* ESE Duration: 2 hours for theory and 3 hours for Lab

Course Description: The course provides an insight into the fundamentals of the basic topics of Computer Science such as Operating Systems, Database Management System, Computer Networks and Web Design. Course covers the essentials of all these diverse areas of Computer Science to provide a fundamental understanding about them to the students. Laboratory components are added in each module to provide a practical exposure to the learners.

Course Objectives:

- To understand the basics of Operating System
- To understand the basics of Database Management System
- To understand the basics of Computer Networks
- To understand the basics of Web Design

At the end of the Course, the Student will be able to:

SL #	Course Outcomes
CO1	Explain the the basics of Operating System
CO2	Illustrate various features of Database Management System
CO3	Explain the fundamentals of Computer Networks
CO4	Explain the basics of web design and design simple static websites

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓

COURSE CONTENTS

Module 1: Definition of Computer Science - Classifications of Computer - Basic Building Block of Computer - Vonn Nueman Concept - Computer Hardware and Software - Classification of Software. Operating Systems: Definition - Structure - Types - Functions. Features of Windows and Linux Operating Systems. Case Study: Basic shell commands in Linux: Introduction to Shell Commands - Basic Folders - File and Folder Management: listing files, viewing contents in files, creating and deleting folders, creating files - moving and copying files and/or folders, man pages, setting permissions on files/directories. listing users that are logged in, listing the current user on the shell, listing all the details of the current user on the shell, listing the path of the current folder, adding a user, listing users that are currently created in the system, displaying the currently running process, the Kernel name, the processor name, the details of the operating system, and the information about the primary and secondary memory installed in the device.

Module 2: Database Management System: Introduction - Definition of Database and Database Management System (DBMS) - Unstructured, Semi

C8

Structured and Structured Data - Characteristics of DBMS - Advantages of DBMS - Components of DBMS - Database Users - Data Models and Schema - Three Schema architecture - Database Languages - Database Architectures and Classification. Case Study: Structured Query Language (SQL) - Types of Commands: DML - DDL - DCL. Table: Definition - Data Types - Primary Key - Foreign Key - Creation - Deletion - Modification - Updation. Constraints: NULL - NOT NULL - UNIQUE. Displaying Data from Tables: Select - Logical operators - WHERE - Pattern matching - ORDER BY.

Module 3: Computer Networks: Definition - Advantages - Components - Categories. Transmission Modes: Simplex, Half duplex, Full duplex. Topology: Definition, Characteristics, Advantages and Disadvantages of Mesh, Star, Bus, Ring. Transmission Media - Wired (Definition, Characteristics, Advantages and Disadvantages of Shielded and Unshielded Twisted Pair, Coaxial, Optical) - Wireless (Definition, Characteristics, Advantages and Disadvantages of Microwave, Radio Wave and Infrared). Overview of OSI and TCP/IP Models. Networking Devices: Hub, Switch, Repeater, Bridge, Router. IP Address: V4 and V6. Case Study of networking command: host, hostname, ping, ifconfig, ip, traceroute, tracepath, netstat, ss, dig.

Module 4: Fundamentals of WWW: Web Technology - Client Server Communication - DNS Server. Web Design using HTML: Static and Dynamic Web - Introduction to HTML5 - Anatomy of HTML document - Container Tags - Empty Tags - Element - Attributes. Creating HTML document - Fundamental Elements (<!DOCTYPE>, <head>, <title>, <body>) - View HTML document in Browsers. Text Formatting: <b>, <i>, <u>, <emp>, <mark>, <small>, <del>, <sub>, <sup> - Comments - Headings - Paragraphs - Alignments - Background and Text Colour Formatting. Inserting Images: image formats supported, src, alt, width, height, alignment, border. Adding Links: img, target, image as a link, link to email. Tables: Creation, Row, Columns, Borders, Size, Heading, Caption, Alignment. Lists: Ordered, Unordered, Description. Additional Formatting: address, marquee, font, favicon. Case Study: Design and development of

static web pages using HTML.

Module X : History and Evolution of Computer as a Problem-Solving Tool - Evolution of Computer Science as a Branch of Science - Evolution of Computer Science as a Career Option - Evolution of OS - Evolution of DBMS - History and Evolution of Computer Networks - Design of websites with client-side script

Core Compulsory Readings

1. Computer Fundamentals by P.K Sinha

2. Linux in a Nutshell, Ellen Siever, Stephen Figgins, Robert Love, Arnold Robbins, O'Reilly

3. Elmasri R. and S. Navathe, Database Systems: Models, Languages, Design and Application Programming, Pearson Education, 2013.

4. Introduction to Database Systems, CJ Date, Addison Wesley. 4. Database Management Systems Ramakrishnan McGraw Hill

5. Behrouz A. Forouzan, Data Communications and networking, Fourth Edition, McGraw Hill 2017

6. Wale Soyinka, Linux Administration A Beginner's Guide, Fifth Edition, TMH

7. HTML 5 Blackbook, Dreamtech Press, ISBN 987-93-5119-907-6, 2016 Edition.

Core Suggested Readings

1. An introduction to Digital Computer design by V. Rajaraman and T. Radhakrishnan

2. Computer fundamentals by B. Ram

3. Andrew S. Tanenbaum, Computer Networks, Fifth Edition, Prentice-Hall 2011

4. William Stallings, Data and Computer Communication, Tenth Edition,

Prentice-Hall 2014

5. Evi Nemeth , et al, Linux Administration Hand Book , PHI 2018
6. Sliberschatz A., H. F. Korth and S. Sudarshan, Database System Concepts, 6/e, McGraw Hill, 2011.
7. Jon Duckett, Web Programming with HTML, XHTML, CSS, Wrox Beginning.

TEACHING LEARNING STRATEGIES

- Lecturing, Demonstration, Digital Learning, Team Work

MODE OF TRANSACTION

- Lecture, Seminar, Discussion

ASSESSMENT RUBRICS

Refer to Section 7 of FYIMP- Computational Science - Scheme and Syllabus for the 4 credit courses with 2 Credit Theory + 2 Credit Practical.

Sample Questions to Test Outcomes

1. Explain Von Nueman Architecture
2. List the advantages of DBMS
3. Identify the layers in OSI Model
4. Explain the anatomy of HTML document
5. Differentiate between any two classes of computers
6. Prepare the SQL commands to create two sample tables with a foreign key relationship between them
7. Differentiate between switch and hub
8. Prepare short notes on creating links in HTML document
9. Explain the evolution of the computer as a problem-solving tool
10. Explain the concepts of the database management system
11. Explain OSI model
12. Illustrate various text formatting options in HTML