



ASRA COLLEGE OF ENGG. & TECH. (Polytechnic Wing), BHAWANIGARH.



STUDENT HAND BOOK

Diploma CSE

Semester- 3rd

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

ASRA COLLEGE OF ENGINEERING & TECHNOLOGY

BHAWANIGARH (SANGRUR)



STUDY SCHEME

Revised Study Scheme w.e.f. Aug' 2012

SEMESTER : THIRD (COMPUTER SCIENCE AND ENGINEERING)

Sr. No.	SUBJECTS	STUDY SCHEME Hrs/Week		MARKS IN EVALUATION SCHEME								Total Marks of Int. & Ext.
		Th	Pr	INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
				Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
3.1	**Digital Electronics	4	3	15	10	25	75	3	25	3	100	125
3.2	*Computer Programming Using C	4	3	15	10	25	75	3	50	3	125	150
3.3	*System analysis and Design	4	-	25	-	25	75	3	-	-	75	100
3.4	*RDBMS	4	4	15	10	25	75	3	50	3	125	150
3.5	*Multimedia and Applications	3	4	15	10	25	75	3	50	3	125	150
3.6	*Computer Workshop	-	4	-	50	50	-	-	50	3	50	100
#	Student Centred Activities and Environmental Studies	1	2	20	30	50	25	-	25	-	-	100
Total		20	20	105	120	225	400	-	250	-	650	875

* Common with diploma programmes in IT

** Common with diploma programmes in ETE, Electronics (µP), and IT

Will comprise of co-curricular activities like extension lectures, games, hobby clubs, including photography, seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities etc. along with the study of Environment Studies

ACU



Syllabus



SYLLABUS

COMPUTER PROGRAMMING USING 'C'

L P

4 3

RATIONALE

Computers play a vital role in present day life, more so, in the professional life of technician engineers. People working in the field of computer industry, use computers in solving problems more easily and effectively. In order to enable the students use the computers effectively in problem solving, this course offers the modern programming language C along with exposition to various applications of computers. The knowledge of C language will be reinforced by the practical exercises.

DETAILED CONTENTS

1. Algorithm and Programming Development (06 Hrs)

Steps in development of a program, Flow charts Algorithm development, Program debugging

2. Program Structure (06 Hrs)

I/o statements, assign statements. Constants, variables and data types, Operators and Expressions, Standards and Formatted, Use of Header & Library files

3. Control Structures (10 Hrs)

Introduction, Decision making with IF – statement, IF – Else and Nested IF, While and do-while, for loop, Break and switch statements

4. Functions (08 Hrs)

Introduction to functions, Global and Local Variables, Function Declaration, Standard functions, Parameters and Parameter Passing, Call – by value/reference, Recursion

5. Arrays (06 Hrs): Introduction to Arrays, Array Declaration and Initialization, Single and Multidimensional Array. Arrays of characters

6. Pointers (08 Hrs): Introduction to Pointers, Address operator and pointers, Declaring and Initializing pointers, Assignment through pointers, Pointers and Arrays

7. Structures and Unions (08 Hrs): Declaration of structures, Accessing structure members, Structure Initialization, Arrays of

structures, Unions

8. Strings (06 Hrs): Introduction, Declaring and Initializing string variables, Reading and writing strings, String handling functions, Array of strings

9. Files (06 Hrs): Introduction, File reading/writing in different modes, File manipulation using standard function types



List of Books Recommended

1. Programming in ANSI C by E Balaguruswami, , Tata McGraw Hill Education Pvt Ltd , New Delhi
2. Application Programming in C by RS Salaria, Khanna Book Publishing Co(P) Ltd. New Delhi
3. Programming in C by Gottfried, Schaum Series, , Tata McGraw Hill Education Pvt Ltd , New Delhi
4. Exploring C by Yashwant Kanetkar – BPB Publications, New Delhi
5. Programming in C by Stefin G. Coachin
6. Programming in C by R Subburaj, Vikas Publishing House Pvt. Ltd., Jangpura, New Delhi
7. Elements of C by M.H. Lewin, Khanna Publishers, New Delhi
8. Programming in C by Stephen G Kochan
9. Programming in C by BP Mahapatra, Khanna Publishers, New Delhi

ACCEPTED



System Analysis and Design

L T P

4 - -

RATIONALE

The system analysis and design is backbone of Application software development. After studying the subject the students will be able to develop and design the system according to given requirements. It involves various steps in analysis and design of the system. It includes the knowledge of preparing a project systematically. It is important to know about various aspects of system analysis and design so that the students will be able to understand the responsibilities while designing and implementing the project.

DETAILED CONTENTS:

1. Introduction: Concept of system. Types of systems, Open and Closed, Static and Dynamic with examples (04 hrs)
2. Overview of System Analysis and Design : Systems Development life cycle, brief Introduction to feasibility, design implementation and testing and maintenance (08 hrs)
3. Preliminary Investigations: Project selection, scope definition and preliminary investigation (08 hrs)
4. Feasibility Study : Technical and economic and operational feasibility, cost and benefit analysis (08 hrs)
5. Requirement Specifications and Analysis : Fact finding techniques, data flow diagrams, data dictionaries, decision trees and tables. (08 hrs)
6. Detailed Design : Module specification, file design, data base design (05 hrs)
7. Testing and Quality Assurance: Maintenance, unit and integration testing techniques, design objectives, quality factors such as reliability etc. (07 hrs)

INSTRUCTIONAL STRATEGY:

The system analysis and design is a theoretical subject, so after completing the syllabus of system analysis and design the teacher will ask group of students to select a small project. The students will apply system analysis and design in preparation of the project.



RECOMMENDED BOOKS:

- 1) Structured System Analysis and Design by ISRD Group, Tata McGraw Hill Education Pvt Ltd, New Delhi
- 2) System Analysis and Design by Awad, Galgotia Publications, New Delhi
- 3) System Analysis and Design Vol. I & II by Lee, Galgotia Publications
- 4) System Analysis and Design with Case Tools by Len Fertuck WCB Publications 1992
- 5) Introducing System Analysis by Skidmore, BPB Publication, New Delhi
- 6) Introducing System Design by Skidmore, BPB Publication, New Delhi
- 7) System Analysis and Design by Jefery L Whitten, Tata McGraw Hill Education Pvt Ltd, New Delhi
- 8) System Analysis and Design by Perry Edward
- 9) Analysis and design of Information System by V Rajaraman, Prentice Hall of India, New Delhi
- 10) Practical System Design by Daniels, Galgotia Publications, New Delhi

ACCEPTED



RDBMS

L T P

4 - 4

1. Introduction

Database Systems; Database and its purpose, Characteristics of the database approach, Advantages and disadvantages of database systems. Classification of DBMS Users; Actors on the scene, Database Administrators, Database Designers, End Users, System Analysts and Application Programmers, Workers behind the scene (DBMS system designers and implementers, tool developers, operator and maintenance personnel)

2. Database System Concepts and Architecture

Data models, schemas, instances, data base state. DBMS Architecture; The External level, The conceptual level, The internal level, Mappings. Data Independence; Logical data Independence, Physical data Independence. Database Languages and Interfaces; DBMS Language, DBMS Interfaces. Classification of Database Management Systems

2. Data Modeling using E.R. Model (Entity Relationship Model): Data Models Classification; File based or primitive models, traditional data models, semantic data models. Entities and Attributes, Entity types and Entity sets, Key attribute and domain of attributes, Relationship among entities

4. Relational Model:

Relational Model Concepts: Domain, Attributes, Tuples and Relations. Relational constraints and relational database schemes; Domain constraints, Key constraints and constraints on Null. Relational databases and relational database schemes, Entity integrity, referential integrity and foreign key

5. Normalization

Non-loss decomposition and functional dependencies, First, Second and Third normal forms, Boyce/Codd normal form

6. Database Access and Security

Database security, process controls, database protection, 2-phase command protocols, 2-phase working protocols, grant and revoke

7. MYSQL/SQL (Structured Query Language)

SQL * Plus. DDL (Data Definition Languages): Creating Tables, Creating a table with data from another table, Inserting values into a table, updating columns of a Table, Deleting Rows, Dropping a Table. DML (Data Manipulation Language): Database Security and Privileges, Grant and Revoke Command, Maintaining Database Objects, Commit and Rollback, various types of select commands, various types of join.

8. PL/SQL:

Introduction to PL/SQL, Advantage of PL/SQL, PL/SQL Block Structure, PL/SQL Architecture, Fundamentals of PL/SQL, PL/SQL Data types, Variables and constants, scope of variables, Assignment & expression, operators, operator precedence.



Multimedia and Applications

Introduction (05 hrs)

Introduction to multimedia, hypertext, hypergraphics, animation, application in education and training, science and technology, kiosks, business and games

2. Multimedia Hardware (08 hrs)

Multimedia PC configuration, features and specifications of sound and video interfaces, OCR, touch-screen, scanners, digital cameras, speakers, printers, plotters, optical disks and drives as CDROM and DVD. multimedia networks

3. Multimedia Software (12 hrs)

Image and sound file formats, multimedia file formats, compression, standards and techniques, features of software to read and write such files. Video file formats & compression standards, multimedia operating systems

4. **Using Image Processing Tools** (10 hrs): Photo-shop workshop, image editing tools, specifying and adjusting colors, using gradient tools, selection and move tools, transforming path drawing and editing tools, using channels, layers,

filters and actions

5. Multimedia Authoring Tools (13 hrs)

Types of Authoring programmes – Icon based, Time based, Story boarding/scripting and object oriented working in macromedia flash, exploring interface using selection of PEN tools. Working with drawing and painting tools, applying color viewing and manipulating time line, animating, processing, guiding layers, importing and editing sound and video clips in flash

Suggested Readings/ Books:

1. Principles of Multimedia by Parikh, Tata McGraw Hill Education Pvt Ltd , New Delhi
2. Multimedia Technologies by Banerji, Tata McGraw Hill Education Pvt Ltd , New Delhi
3. Multimedia An Introduction by Villam Casanova and Molina; Prentice Hall of India, New Delhi
4. Multimedia Bible by Win Rosch
5. Multimedia Making it work by Vaughan, Tay
6. Photo-shop for Windows Bible by Deke Maclelland IDG Books India Pvt. Ltd., New Delhi
7. Multimedia Technology and Application by Hillman, Galgotia Publications, New Delhi
8. Flash 5 Bible by Rein Hardit, IDG Books India Pvt. Ltd.
9. Flash 5 in easy steps by Vandome IDG Books India Pvt. Ltd.
10. Fundamentals of Multimedia by Li and Drew, Pearson Publications



DIGITAL ELECTRONICS

1. Introduction (02 hrs)
 - a) Distinction between analog and digital signal.
 - b) Applications and advantages of digital signals.
2. Number System (04 hrs)
 - a) Binary, octal and hexadecimal number system: conversion from decimal and hexadecimal to binary and vice versa.
 - b) Binary addition, subtraction, multiplication and division including binary points. 1's and 2's complement method of addition/subtraction, sign magnitude method of representation, floating point representation
3. Codes and Parity (04 hrs)
 - a) Concept of code, weighted and non-weighted codes, examples of 8421, BCD, excess-3 and Gray code.
 - b) Concept of parity, single and double parity and error detection
 - c) Alpha numeric codes: ASCII and EBCDIC.
4. Logic Gates and Families (07 hrs)
 - a) Concept of negative and positive logic
 - b) Definition, symbols and truth tables of NOT, AND, OR, NAND, NOR, EXOR Gates, NAND and NOR as universal gates.
 - (c) Logic family classification:
 - Definition of SSI, MSI, LSI, VLSI
 - TTL and C MOS families and their sub classification
 - Characteristics of TTL and C MOS digital gates. Delay, speed, noise margin, logic levels, power dissipation, fan-in, power supply requirement and comparison between TTL and C MOS families 86
5. Logic Simplification (06 hrs)
 - a) Postulates of Boolean algebra, De Morgan's Theorems. Various identities. Formulation of truth table and Boolean equation for simple problem. Implementation of Boolean (logic) equation with gates
 - b) Karnaugh map (upto 4 variables) and simple application in developing combinational logic circuits
6. Arithmetic circuits (06 hrs)
 - a) Half adder and Full adder circuit, design and implementation.
 - b) Half and Full subtractor circuit, design and implementation.
 - c) 4 bit adder/subtractor.
 - d) Adder and Subtractor IC (7484)
7. Decoders, Multiplexers and De Multiplexers (06 hrs)
 - a) Four bit decoder circuits for 7 segment display and decoder/driver ICs.
 - b) Multiplexers and De-Multiplexers
 - c) Basic functions and block diagram of MUX and DEMUX. Different types and ICs
8. Latches and flip flops (06 hrs)
 - a) Concept and types of latch with their working and applications
 - b) Operation using waveforms and truth tables of RS, T, D, Master/Slave JK flip flops.
 - c) Difference between a latch and a flip flop
 - d) Flip flop ICs
9. Counters (8 hrs)
 - a) Introduction to Asynchronous and Synchronous counters
 - b) Binary counters



- c) Divide by N ripple counters, Decade counter.
- d) Pre settable and programmable counters
- e) Up/down counter
- f) Ring counter with timing diagram
- g) Counter ICs

10. Shift Register (07 hrs)

Introduction and basic concepts including shift left and shift right.

- a) Serial in parallel out, serial in serial out, parallel in serial out, parallel in parallel out.
- b) Universal shift register
- c) Buffer register, Tristate Buffer register
- d) IC 7495 87

11. A/D and D/A Converters (08 hrs)

- a) Working principle of A/D and D/A converters
- b) Brief idea about different techniques A/D conversion and study of :
 - Stair step Ramp A/D converter
 - Dual Slope A/D converter
 - Successive Approximation A/D Converter
- c) Detail study of :
 - Binary Weighted D/A converter
 - R/2R ladder D/A converter
- d) Performance characteristics of A/D and D/A converter.
- e) Applications of A/D and D/A converter.



Computer Workshop

Part-A(Hardware)

1. Familiarization with various components and parts of personal computers, mother board details, hard disk drive, floppy disk drive. CD Rom drive, DVD, keyboard, display devices, various chips (memory chips and CPU); serial and parallel ports, inkjet, USB Ports, Fire wire, Bluetooth, Dot matrix and Laser printers, Modems, connectors and cables
2. Assembly and Disassembling of PCs : Power supply, linear power supply and switch mode power supply, trouble shooting of SMPS.
3. Setting up of basic infrastructure for computers (including power layout, air conditioning, earthing etc.

Part-B(Software)

4. Installation of various operating systems, LINUX/ windows latest versions. Familiarization of their features with practical demonstrations. Installation and configuration of device drivers. Disk management
5. Installation of latest version of application software like MS-Office/open office, Adobe Photoshop, Corel Draw, Macromedia Flash etc.
6. Installation and configuration of latest version of database software like Oracle, MySQL/ SQL Server etc.
7. Introduction to Virus/Spyware/Worm/Trojan Horse , their detection, prevention and cure.
8. Installation, uninstallation and use of Antivirus software.
9. Visit to computer manufacturing industry



Lab Syllabus

ACCEPT



Digital Electronics

LIST OF PRACTICALS

1. Verification and interpretation of truth tables for AND, OR, NOT NAND, NOR and Exclusive OR (EXOR) and Exclusive NOR (EXNOR) gates
2. - Realisation of logic functions with the help of NAND or NOR gates
- Design of a NOR gate latch and verification of its operation
3. To design a half adder using XOR and NAND gates and verification of its operation Construction of a full adder circuit using XOR and NAND gates and verify its operation
4. 4 bit adder, 2's complement subtractor circuit using an 4 bit adder IC and an XOR IC and verify the operation of the circuit.
5. To design a NOR Gate Latch and verification of its operation
- 6 Verification of truth table for positive edge triggered, negative edge triggered, level triggered IC flipflops (At least one IC each of D latch , D flip-flop, JK flip-flops).
7. Verification of truth table for encoder and decoder ICs, Mux and DeMux
8. To design a 4 bit SISO, SIPO, PISO, PIPO shift registers using JK/D flip flops and verification of their operation.
9. To design a 4 bit ring counter and verify its operation.
10. Asynchronous Counter ICs: Verification of truth table for any one universal shift register IC
Use of IC 7490 or equivalent TTL (a) divide by 2 (b) divide by 10 Counter
OR
Use of IC 7493 or equivalent TTL (a) divide by 2 (b) divide by 8 (c) divide by 16 counter



Computer Programming Using C

LIST OF PRACTICALS

1. Programming exercises on executing and editing a C program.
2. Programming exercises on defining variables and assigning values to variables.
3. Programming exercises on arithmetic and relational operators.
4. Programming exercises on arithmetic expressions and their evaluation
5. Programming exercises on formatting input/output using printf and scanf
6. Programming exercises using if statement.
7. Programming exercises using if – Else.
8. Programming exercises on switch statement.
9. Programming exercises on do – while statements.
10. Programming exercises on for – statement.
11. Programs on one-dimensional array.
12. Programs on two-dimensional array.
13. (i) Programs for putting two strings together.
(ii) Programs for comparing two strings.
14. Simple programs using structures.
15. Simple programs using pointers.
16. Simple programs for reading from a file and writing into a file.

ACCEPTED



RDBMS

1. Exercises on creation and modification of structure of tables.
2. Exercises on inserting and deleting values from tables.
3. Exercises on querying the table (using select command).
4. Exercises on using various types of joins.
5. Exercises on using functions provided by database package.
6. Exercises on commands like Grant, Revoke, Commit and Rollback etc.
7. Introductory exercises on PL/SQL.
8. Design of database for any application using oracle.

ACCEPT



Multimedia and Applications

LIST OF PRACTICALS

1. Installation of various multimedia software like Photoshop, Flash, Director or any open source software
2. Installing and use of various multimedia devices
 - Scanner
 - Digital camera, web camera
 - Mike and speakers
 - Touch screen
 - Plotter and printers
 - DVD
 - Audio CD and Video CD
3. Reading and writing of different format on CD/DVD
4. Transporting audio and video files
5. Using various features of Flash
6. Using various features of Photo-shop
7. Making multimedia presentations combining, Flash, Photo-shop, such as department profile, lesson presentation, games and project presentations

ACCEPTED



Assignments



Multimedia and Applications Assignment 1

1. Define multimedia, http and animation?
2. How multimedia is helpful in business and games?
3. Explain applications in science and technology?
4. What are features of sound interfaces?
5. Explain multimedia hardware?

Assignment 2

1. What is compression?
2. Explain Video file formats & compression standards?
3. Explain in brief multimedia operating systems?
4. What are file formats?

Assignment 3

1. Define image editing tools?
2. How can be adjust colors?
3. Explain filters and actions?
4. What is photo shop workshop?,
5. What are drawing and editing tools?

Assignment 4

1. Define Image and sound file formats?
2. Explain standards and techniques in Multimedia?
3. What are Video file formats?
4. Discuss in brief compression standards?



Assignment 5

- 1.Explain Working with drawing and painting tools?
- 2.How sound and video files are imported?
- 3.How animating and processing is done with various tools?
- 4.Explain Time based Programmes?

ACCEPT



System Analysis and Design

S. No.	Description of Assignment
1	<p style="text-align: center;">ASSIGNMENT-1</p> <p>Q1) Define System and its characteristics? Q2) Explain static and dynamic systems? Q3) Differentiate between open and closed system? Q4) Write a note on integration and interdependence?</p>
2	<p style="text-align: center;">ASSIGNMENT-2</p> <p>Q1) Explain SDLC. Q2) How does sequential nature of SDLC degrades performance? Q3) How does bottom up approach in harmful for developing systems? Q4) How does a system analyst collects facts from existing documents? Q5) Explain the stages of preliminary investigations?</p>
3	<p style="text-align: center;">ASSIGNMENT 3</p> <p>Q1) What is usability analysis? Q2) Explain how technical feasibility is checked? Q3) State the various development costs in SDLC? Q4) What is Feasibility study? Explain its various types?</p>
4	<p style="text-align: center;">ASSIGNMENT 4</p> <p>Q1) Difference between Functional and Non- functional requirements? Q2) Explain fact finding ethics? Q3) What are the advantages and disadvantages of Observation? Q4) Explain Questionnaires? Q5) Explain : Decision Tables, Data Flow Diagrams, Data Dictionary and Flow Charts?</p>
5	<p style="text-align: center;">ASSIGNMENT 5</p> <p>Q1) Write a note on Physical design and Logical design? Q2) Write a short note on data redundancy and data consistency? Q3) What are the features of DBMS? Q4) Write a note short note on Testing? Write the various types of tests done on systems? Explain. Q5) Explain different types of Testing techniques?</p>



RDBMS

S. No.	Unit/Chapter name from which assignment is set	Description of Assignment
1	Database System Concepts and Architecture and Introduction to RDBMS	Q.1) What is DBMS? Give its advantages & disadvantages? Q.2) Give the architecture of DBMS? Q.3) What is Data Independence? Q.4) Give the classification of DBMS? Also give their advantages and disadvantages? Q.5) Explain database languages?
2	Data Modeling using E.R. Model (Entity Relationship Model)	Q.1) What are Data models? Explain with example? Q.2) Explain the basic notations for E-R Diagram? Q.3) Explain Weak and Strong Entity with example? Q.4) Explain Ternary Relation with example? Q.5) What is entity and attributes? Explain different types of attributes in ER diagram?
3	Relational Model and Normalization	Q.1) Explain Relational Model with example? Q.2) Explain Entity Integrity and Referential Integrity? Q.3) What are Keys? Define different types of Keys with example? Q.4) Difference between BCNF and 3NF? Q.5) What is Normalization? Define its Normal Forms?
4	Database Access and Security & MYSQL/SQL (Structured Query Language)	Q.1) What is Security? Why it is necessary to secure data in DBMS? Q.2) Define DDL language with its commands? Q.3) Give the syntax of ALTER command in SQL? Also explain how to add/remove column from a table? Q.4) Give the syntax of INSERT command with an example? Q.5) Explain Delete and Drop command?
5	MYSQL/SQL (Structured Query Language) & PL/SQL	Q.1) Give the syntax of SELECT command with example? Q.2) Explain GRANT command and REVOKE command with example? Q.3) What is PL/SQL? Explain PL/SQL block structure? Q.4) Describe various data types of PL/SQL? Q.5) Give the advantages of PL/SQL?



Computer Programming Using C

S. No.	Unit/Chapter name from which assignment is set	Description of Assignment
1	Algorithm and Programming Development and Program Structure	<ul style="list-style-type: none">• Define I/o statements.• What is Flow chart.• What are assign statements.• What is Algorithm development• Explain Constants, variables and data types.
2	Control Structures	<ul style="list-style-type: none">• Explain in detail IF – Else.• Explain in detail Nested IF.• What are While and do-while, for loop.• Explain one example for while and do while loop.
3	Functions	<ul style="list-style-type: none">• What are Global and Local Variables.• Explain in brief Call – by value/reference• What is Recursion.• What is Standard functions.
4	Array and pointer	<ul style="list-style-type: none">• What is an Array .• How array can be Initialization.• What is Single and Multidimensional Array .• What are Arrays of characters
5	Structures and Unions, Strings	<ul style="list-style-type: none">• What are declaring and Initializing string variables.• What is Reading and writing strings.• What is Arrays of structures.• What is Union.



Digital Electronics

List of Assignments

Assignment No.1

1. What is analog & digital signal
2. Binary to decimal conversion
(110101)₂ , (110110)₂
3. convert (1035)₈ to decimal.
4. convert (627)₈ to binary.
5. Convert (4F)₁₆ to decimal.

Assignment No.2

1. Convert (47.35) to 8421 code
2. Convert 26 to excess-3 code
3. Truth table of AND , OR ,NOT gates
4. Universal properties of NAND gates
5. Explain CMOS technology

Assignment No.3

1. Explain combinational & sequential circuit
2. Explain adders (Half adder , Full adder)
3. Explain Half & Full subtractor

Assignment No.4

1. .Explain 4 bit binary decoder
2. Explain 4:1 MUX
3. Explain LED
4. Explain 1:4 DEMUX
5. Applications of MUX



Assignment No.5

1. Explain JK flip flop
2. Explain Universal Shift Register
3. Explain Gated S-R Latch
4. Explain Shift Registers
5. Explain D flip flop

ACCEPT