Shiv Chhatrapati Shikshan Sanstha's

Rajarshi Shahu Mahavidyalaya, Latur

(Autonomous)

Curriculum

2020-2021

B.Sc. C.S.

(CC/AECC/SEC/GE)

UG First Year Semester I & II

Under CBCS

Three Year Degree Programme in B.Sc.C.S.

(Six Semester Course)

Syllabi approved by the Board of Studies in

B.Sc.C.S. with effect from June, 2017

Rajarshi Shahu Mahavidyalaya (Autonomous), Latur
Department of Information Technology
Syllabus outline of B.Sc.C.S. First Year
Under CBCS Pattern

Semester: I

Course Code	Course Title	Maximum Marks		Total	
		Internal	End Semester	Marks	Credits
U-COE-101	Communicative English-I	20	30	50	2
U-FCS-171	Fundamentals of Computer Science	20	30	50	3
U-DIE-172	Digital Electronics	20	30	50	3
U-PWC-173	Programming with C	20	30	50	3
U-INL-174	Introduction to Linux O.S.	20	30	50	3
U-LAC-175	Lab Course-I (FCS)	20	30	50	2
U-LAC-176	Lab Course-II (DE)	20	30	50	2
U-LAC-177	Lab Course-III (C)	20	30	50	2
U-LAC-178	Lab Course-IV (Linux)	20	30	50	2
	Total (I)			**450**	**22**

Semester: II

Course Code	Course Title	Maximum Marks		Total	
		Internal	End Semester	Marks	Credits
U-COE-201	Communicative English-II	20	30	50	2
U-DIM-271	Discrete Mathematics	20	30	50	3
U-DBM-272	Database Management System	20	30	50	3
U-ADC-273	Advance C	20	30	50	3
U-WET-274	Web Technology	20	30	50	3
U-LAC-275	Lab Course-V (DM)	20	30	50	2
U-LAC-276	Lab Course-VI (DBMS)	20	30	50	2
U-LAC-277	Lab Course-VII (Adv. C)	20	30	50	2
U-LAC-278	Lab Course-VIII (WT)	20	30	50	2
U-MOE-235	Moral Education (NCBC)	20	30	50	-
	Total(II)			**450**	**22**
	Total Marks Semester I + Semester II			**900**	**44**

Semester - I

Course Title: **Communicative English–I**
Course Code: U-COE-101

Total Lectures: 50 **Total Marks: 50**
Credits: 2

Learning Objectives:

1. To enhance learner's communication skills by giving adequate exposure (use of language lab) in listening and speaking skills and the related sub-skills.
2. To create learner's confidence in oral and interpersonal communication by reinforcing the basics of pronunciation.
3. To help learners to recognize and make use of sentence structures in English

Course Outcomes:

1. Students will be aware of listening and speaking skills and the related sub-skills. They can focus a lot on listening style to be the better speaker of English language
2. Students can realize the proper style of English for oral communication and can use words and sentences with proper accent and intonation.
3. Students will speak English by using proper sentence structures

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The paper has three units to be done in each semester.

Syllabus

Unit-I: Communication

1. Definitions of Communication
2. Objectives of Communication
3. Types of communication & Barriers to Communication

Unit-II: Practical Phonetics 1

1. The IPA symbols and the sounds of English
2. The Speech Organs
3. Classification of English Sounds

Unit-III: Basic Grammar 1

i) Word class
ii) Tense / Verb Forms
iii) Articles, Prepositions

Unit-IV: Oral Communication 1

1. The notion of formal and informal communication situations

Formal Situations – Greetings, Talking with - Principal, Government officer, doctor, bank officers and employees, and college guests,
Informal Situations - Greetings, Talking with - parents, siblings, other family members,relatives, friends, and neighbors
2. Formal, informal and functional expressions
3. Recognizing (in listening) and appropriately using (in speaking/writing) formal and informal expressions

Practical

Students should make a recording of the lessons learnt in a CD and submit it to the department as per the instructions given by the teacher.

Reference Books

1. Balasubramanium, T. 1981. A Textbook of Phonetics for Indian Students. New Delhi: Macmillan
2. Sethi, J. & P. V. Dhamija, 1997. A Course in Phonetics and Spoken English. New Delhi, Prentice-Hall
3. Crystal, David. 1985. Rediscover Grammar with David Crystal. Longman
4. Bakshi, R. N. A Course in English Grammar. Orient Longman
5. Dwivedi, R.K. and A. Kumar. Macmillan Foundation English Published by Macmillan India Ltd.
6. Patil Z. N. Valke B.S, Thorat Ashok & Merchant Zeenat. English for Practical Purposes. Chennai, Macmilan
7. Tengse R Ajay, Soft Skills A Textbook for Undergraduates. Hyderabad. Orient Blackswan

Course Title: Fundamentals of Computer Science
Course Code: U-FCS-171

Total Lectures: 50 **Total Marks: 50**
Credits: 3

Learning Objectives:
To produce programmers equipped with an understanding of

- fundamental computational concepts underlying most programming languages
- a range of problem solving techniques using computers
- the role of programming within the overall software development process
- attitudes and working practices appropriate for a professional programmer and skills supporting the solution of small problems using a programming language
- the clear expression of solutions at different levels of abstraction
- Independent and self-motivated study in Computing Science.

Course Outcomes:
On successful completion of the course the students will be able to:

1. Identify the parts of the computer system.
2. Adequately explain functioning of computer components.
3. Explain the process of problem solving using computer

SYLLABUS

UNIT I: Computer System & Data Representation within Computer
1. Introduction to Computer System
1.1. Introduction
1.2. Basic structure, ALU memory, CPU, I/O devices
1.3. Generations of computer
1.4. Evolution of computer
1.5. Classification of computers : Notebook computers, personal computers, workstation, micro, mini, mainframe, super computer

2. Data Representation within Computer
2.1. Bit, Byte, Word
2.2. ASCII, EBCDIC, BCD code
2.3. Introduction to number system
2.4. Decimal, Binary, Octal, Hexadecimal

UNIT II: Input Output Devices & Memory

3. Input Output Devices
3.1. Input Devices: Keyboard, Point & Draw Devices, Data Scanning devices, Digitizer, Electronic Card Reader, Voice Recognition devices
3.2. Output Devices: Monitor, Printer, Plotter, Screen Image projector, voice response system.

4. Memory
4.1. RAM, ROM, PROM, EPROM, EEPROM
4.2. Base Memory, Extended memory, expanded memory, cache memory
4.3. Storage devices: Tape, FDD, HDD, CD ROM

UNIT III: Computer Software & Introduction to Operating System

5. Computer Software
5.1. Definition of software
5.2. Types of software
5.3. Compilers, Interpreters, Assemblers, Linkers, Loaders

6. Introduction to Operating System
6.1. Introduction
6.2. Main function of operating system
6.3. Files and directories
6.4. Types of OS

UNIT IV: Study of Operating systems

7. Study of Operating systems
7.1. Introduction to DOS
7.2. File and directory structure
7.3. Introduction to WINDOWS
7.4. Introduction to LINUX
7.5. Comparative study of operating systems

Reference Books:
1. Fundamentals of computer science-P.K.SINHA.
2. Fundamentals of computer science-V RAJARAMAN.

Course Title: Digital Electronics
Course Code: U-DIE-172

Total Lectures: 50 **Total Marks: 50**
Credits: 3

Learning Objectives:

- To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits.
- To prepare students to perform the analysis and design of various digital electronic circuits.
- To impart to you a formalism of logic and enabling you to analyse logical processes.
- To enable you to implement simple logical operations using combinational logic circuits.
- To enable you to understand common forms of number representation in digital electronic circuits and to be able to convert between different representations.
- To enable you to understand the logical operation of simple arithmetic and other MSI circuits (Medium Scale Integrated Circuits).
- To impart to you the concepts of sequential circuits enabling you to analyse sequential systems in terms of state machines.
- To enable you to implement synchronous state machines using flip-flops.

Course Outcomes:

On successful completion of the course the students will be able:

- To have a thorough understanding of the fundamental concepts and techniques used in digital electronics.
- To understand and examine the structure of various number systems and its application in digital design.
- The ability to understand, analyze and design various combinational and sequential circuits.
- The Ability to identify basic requirements for a design application and propose a cost effective solution.
- The ability to identify and prevent various hazards and timing problems in a digital design.
- To develop skill to build, and troubleshoot digital circuits.

SYLLABUS

UNIT I: Introduction to Number system and codes

1.1 Logic levels and pulse waveforms
1.2 Different number systems and their conversions (decimal, binary, octal, hexadecimal)
1.3 Binary arithmetic addition, subtraction, multiplication
1.4 Binary subtraction using 1's and 2's complement method, decimal subtraction using 9's and 10's complement method
1.5 BCD numbers ,ASCII codes ,GRAY code

UNIT II: Boolean algebra and Gate networks

2.1 Fundamental concepts of Boolean algebra
2.2Symbol, Boolean equation, truth tables of different types of gate such as inverter or NOT gate, AND gate, OR gate, NAND gate, NOR gate, X-OR gate, X-NOR gate

2.3 Basic laws of Boolean algebra and simplification of Boolean
2.4 Demorgans theorem 1st and 2nd
2.5 Universal property of NAND and NOR gate
2.6 Boolean expressions for gate networks for SOP and POS format
2.7 Karnaugh map for SOP and POS format with examples to find simplified Boolean equation

UNIT III: Combinational Logic Circuit

3.1 Half adder and FULL adder, parallel binary adders
3.2 HALF subtractor and FULL subtractor
3.3 Multiplexer and demultiplexer with types & examples
3.4 Encoder and decoder with types

UNIT IV: Sequential Logic Circuit with Microprocessor

4.1 Flip-flop-latches, edge triggered and level triggered flip flop with types SR flip flop, D flip flop, JK flip flop and T flip-flop
4.2 Buffer registers, modes of operation of registers (SISO, SIPO, PISO, PIPO)
4.3 Asynchronous counters and type
4.4 Synchronous counters and types
4.5 Introduction to microprocessor
4.6 Basic components of a microprocessor

Reference Books

1. Floyd, Thomas L: ", Digital Computer Fundamentals" , 3 rd Edition 1997.
2. Malvino, Pual Albert and Leach, Donald P: ", Digital Computer Fundamentals", 3rd Edition, 1995.TMH.
3. Modern digital electronics by R.P.Jain
4. Bartee, Thomas C, "Digital Computer Fundamentals" 6 th Edition, 1995. TMH

Course Title: Programming with 'C'
Course Code: U-PWC-173

Total Lectures: 50 **Total Marks: 50**
Credits: 3

Learning Objectives:

- To gain experience about structured programming
- To help students to understand the implementation of C language
- To understand various features in C
- To teach basic principles of programming
- To develop skills for writing programs using 'C'

Course Outcomes:

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

1. Design an algorithmic solution for a given problem
2. Write a maintainable C program for a given algorithm
3. Trace the given C program manually
4. Write C program for simple applications of real life using structures and files
5. Solve the given problem using the syntactical structures of C language
6. Develop , execute and document computerized solution for various problems using the features of C language
7. Read and write C programs that uses pointers, structures and files

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Syllabus

UNIT- I: Introduction and Overview

CHAPTER 1. Introduction to 'C' Language

1.1. Algorithm and flowchart
1.2. Introduction to C Programming language
1.3. Introduction to C
1.4. Structure of C program

CHAPTER 2. Overview of 'C'

2.1. Character set, C Tokens
2.2. Keywords
2.3. Identifiers
2.4. Variables
2.5. Constants
2.6. Data Types
2.7. Operators
2.8. Console based I/O and related built-in I/O functions: printf( ),scanf( ), getch()
2.9 Command line argument

UNIT- II: Control Structures, Arrays, Pointers

CHAPTER 3. Control Structures

- 3.1. Decision making structures: If, If-else, Nested If –else, Switch.
- 3.2. Loop Control structures: While, Do-while, for, Nested for loop
- 3.3. Other statements: break, continue, goto, exit

CHAPTER 4. Arrays and Pointers

- 4.1 Introduction to array
- 4.2. Arrays: One Dimensional, Two Dimensional, Multidimensional arrays
- 4.3 Introduction to pointers
- 4.4 Accessing the Address of' a variable
- 4.5 Declaring and initializing pointers
- 4.6 Accessing a variable through its pointers
- 4.7 Pointer to pointer

UNIT- III: Functions

CHAPTER 5. Introduction to Function

- 5.1. Introduction
- 5.2. Function Types
- 5.3. Category of functions
  - 5.3.1 No Arguments and no return values
  - 5.3.2 Arguments but no return values
  - 5.3.3 Arguments with return values
- 5.4 Call by value, call by reference
- 5.7. Recursion

CHAPTER 6. String and Math Functions

- 6.1 String manipulation function
- 6.2 strlen(), strcpy(),strcat(),strcmp(),strlwr(),strupr().
- 6.3 Math Function.

UNIT- IV: Structure, Union and File Management

CHAPTER 7. Structure and union

- 7.1. Introduction, Structure definition
- 7.2. Structure initialization
- 7.3. Arrays of structures
- 7.4. Structures within structures
- 7.5. Unions

CHAPTER 8. **File management in C**

- 8.1. Defining and opening a file
- 8.2. Closing file
- 8.3. I/O operations on files
- 8.4. Random access to files
- 8.5. The Preprocessor.

REFERENCE BOOKS:

1. Let us C-Yashwant Kanetkar.
2. Programming in C- Balguruswamy
3. The C programming Lang., Pearson Ecl – Dennis Ritchie
4. Structured programming approach using C- Forouzah & Ceilberg Thomson learning publication.
5. Pointers in C – Yashwant Kanetkar
6. Programming with C, Byron Gottfried, Schaum's Outline Series – Tata McGraw Hill Publishing Company - 1998

Course Title: Introduction to Linux O.S.
Course Code: U-INL-174

Total Lectures: 50 **Total Marks: 50**
Credits: 3

Learning Objectives:

- Understand Basics of Linux Operating System
- Understand ownership and permissions of the files and directories.
- How to set permissions files/directories
- How to manipulate files/directories – list files, create, delete, and move just about anything on the file system
- Basics of vi - a standard Unix text editor

Course Outcomes:

- Be familiar with different Linux commands used for different purposes.
- Be familiar with various types of operating systems including Unix.
- Student should be able to general purpose related commands.
- Student should be able to execute the file, directory and he also should be also to able to assign the permissions to file or directory.
- Student should be able to create, modify and delete the user.
- Student should be able to compress and decompress the file.
- Student should execute the programs in vi - editor.

SYLLABUS

UNIT I: Introduction to Linux and File System

1. Introduction to Linux O.S.
1.1. Operating System.
1.2. Types of Operating System
1.3. Functions of Operating System
1.4. History of Linux.
1.5. Advantages of Linux.
1.6. Flavors of Linux, Linux Loader, Linux kernel

2. Linux File System
2.1. Linux file system
2.2. Directory structure of Linux
2.3. File System concept ext3, ext2.

UNIT II: Linux commands

3. Linux commands
3.1. General Purpose Utilities – man, who, login, logout, shutdown, passwd.
3.2. File management commands – cat, cp, rm, mv
3.3. Filter related commands – grep, wc, head, tail, sort
3.4. Directory management commands – pwd, cd, mkdir, rmdir, ls
3.5. Checking directories and permissions – pwd, chmod, cd, ls
3.6. Compression commands – zip, unzip, gzip, gunzip,
3.7. printer related commands- lpc ,lpr, lpq. lprm

UNIT III: VI Editor

4. Working with permissions

4.1. Assigning file permissions, directory Permission
4.2. Using text editors
4.3. Editor, use of vi
4.4. Features of vi
4.5. Vi basics, different modes and working with vi
4.6. Command mode -cursor movements (k, j, h, l), delete (character, line, word)

UNIT IV: RPM

5. Working with RPM

5.1. Performing system maintenance
5.2. Communication commands: - write, wall, talk, mesg, motd, Pre-login Message
5.3. Managing software with RPM :- Installing, Uninstalling, Upgrading
5.4 Managing users Groups and passwords.

Reference Books:

1. Bill Ball, David Pitts, "Red Hat Linux 7 Unleashed", Techmedia SAMS Publication

2. EviNemeth, Garth Snyder, Scott Seebass, Trent R. Hein, "UNIX System Administration Handbook" Person Education Asia (LPE) (III rd Edition)

3. Bill Ball & Hoyt Dust "Red hat Linux & fedora unlashed"

Course Title: Lab Course I (FCS)
Course Code: U-LAC-175

Total Marks: 50 **Credits: 2**

Learning Objectives:
To produce programmers equipped with an understanding of

- fundamental computational concepts underlying most programming languages
- a range of problem solving techniques using computers
- the role of programming within the overall software development process
- attitudes and working practices appropriate for a professional programmer and skills supporting the solution of small problems using a programming language
- the clear expression of solutions at different levels of abstraction
- Independent and self-motivated study in Computing Science.

Course Outcomes:
On successful completion of the course the students will be able to:

1. Identify the parts of the computer system.
2. Adequately explain functioning of computer components.
3. Explain the process of problem solving using computer

Proposed Practical List:

1) Study of BOOTING Procedure of O.S.

2) Study of classification of computer.

3) Study of windows O.S.

I) Desktop ii)Icon iii)Taskbar

4) Study of Input and Output Devices.

5) Study of creating File and Folder.

6) Study of moving, copying file and folder from one location to another.

7) Study of MS-DOS Internal Commands

8) Study of MS-DOS External Commands

9) Study of File related commands

10) Study of Directory related Commands.

11) Introduction of MS-Word

12) Prepare time-table in MS-Word

13) Letter writing in MS-Word.

14) Introduction of MS-Excel

15) Introduction of MS-Powerpoint

Course Title: Lab Course II (DE)
Course Code: U-LAC-176

Total Marks: 50 **Credits: 2**

Learning Objectives:

1. Tell the history and development of digital electronics.
2. Identify and describe the six basic logic gates and combinational circuits in digital electronics.
3. Recognize the number systems use in digital logic design and its conversion.
4. Identify and describe flip-flop circuits, shift register circuits with types, counter circuit.

Course Outcomes:

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

1. Recognize the various codes such as ASCII,BCD,EBCDIC,GRAY to secure the information in communication
2. Understand the basics of microprocessor with various block

Proposed Practical List:

1. To perform and verify the truth tables of basic gates and derived gates.
2. To perform and verify the truth tables of EX-OR and EX-NOR gate.
3. To perform and verify LHS and RHS of Demorgan's Theorem I & II.
4. To perform universal property of NAND gate.
5. To perform universal property of NOR gate.
6. To Implement and verify the truth table of any two Boolean equation.
7. To perform and verify the truth table of half adder.
8. To perform and verify the truth table of half subtractor.
9. To perform and verify the truth table of multiplexer.
10. To perform and verify the truth table of De-multiplexer.
11. To perform and verify the truth table of encoder
12. To perform and verify the truth table of Decoder

Course Title: Lab Course III (Prog. With C)
Course code: U-LAC-177

Total Marks: 50 **Credits: 2**

Learning Objectives:

- To gain experience about structured programming
- To help students to understand the implementation of C language
- To understand various features in C
- To teach basic principles of programming
- To develop skills for writing programs using 'C'

Course Outcomes:

- Design an algorithmic solution for a given problem
- Write a maintainable C program for a given algorithm.
- Trace the given C program manually.
- Write C program for simple applications of real life using structures and files
- Solve the given problem using the syntactical structures of C language
- Develop , execute and document computerized solution for various problems using the features of C language
- To read and write C program that uses pointers, structures and files

Proposed Practical List:

1. Write a Structure of C Program.
2. Write a program to define console based input output functions.
3. Program to define arithmetic operators.
4. Write a program to define control and branching statements.
5. Write a program on Switch Case statement.
6. Write a program to define looping statements.
7. Write a program to define goto, break and continue statement.
8. Write a program to accept n numbers and arrange them in ascending order using array.
9. Write a program to use of pointers.
10. Write a program to use of functions.
11. Write a program on String functions.
12. Write a program using math functions.
13. Write a program using Structure and Union.
14. Write a program on fprintf() and fscanf() function.
15. Write a program on fopen() and fclose().

Course Title: Lab Course IV (Linux OS)
Course code: U-LAC-178

Total Marks: 50 **Credits: 2**

Learning Objectives:

- Understand Basics of Linux Operating System
- Understand ownership and permissions of the files and directories.
- How to set permissions files/directories
- How to manipulate files/directories – list files, create, delete, and move just about anything on the file system
- Basics of vi - a standard Unix text editor

Course Outcomes:

- Be familiar with different Linux commands used for different purposes.
- Be familiar with various types of operating systems including Unix.
- Student should be able to general purpose related commands.
- Student should be able to execute the file, directory and he also should be also to able to assign the permissions to file or directory.
- Student must be able to create, modify and delete the user.
- Student should be able to compress and decompress the file.
- Student should execute the programs in vi - editor.

Proposed Practical List:

1) Introduction to Linux O.S.

2) Study of General purpose commands.

3) Study of File related commands.

4) Study of Directory related commands.

5) Study of Directory checking related commands.

6) Study of chmod and ls command

7) Study of Filter related commands.

8) Study of Compression related commands.

9) Study of Printer related commands.

10) Study of Communication commands.

11) Study of Vi editor.

12) Program to display your own information.

Semester - II

Course Title: **Communicative English –II**
Course Code: U-COE-201

Total Lectures: 50 **Total Marks: 50**
Credits: 02

Learning Objectives:

1. To enhance learner's communication skills by giving adequate exposure (use of language lab) in listening and speaking skills and the related sub-skills.
2. To create learner's confidence in oral and interpersonal communication by reinforcing the basics of pronunciation.
3. To help learners to recognize and make use of sentence structures in English

Course Outcomes:

i) Students will be aware of listening and speaking skills and the related sub-skills. They can focus a lot on listening style to be the better speaker of English language
ii) Students can realize the proper style of English for oral communication and can use words and sentences with proper accent and intonation.
iii) Students will speak English by using proper sentence structures

Unit I Oral Communication 2

1. Dialogues (formal and informal)
2. Monologues (formal and informal) – self-introduction (name, class, schooling, family information in detail, aims and objectives, hobbies, likes –dislikes, future plans), short stories, To be assessed through MCQ, short /long answer questions.

Unit II Practical Phonetics 2

1. Syllable
2. Word Accent (11 rules), accent rules of the past/present and plural forms of the words.
3. Transcription
4. Intonation patterns (Falling and Rising)

To be assessed through MCQ, short /long answer questions.

Unit III Basic Grammar 2

1. Basic Clause types (S V O C A)
2. Kinds of sentences (Simple, Compound, Complex etc)
3. Common Errors

Unit-IV Common Errors

1. Common errors in use of parts of speech.

Practical

Students should make a recording of the lessons learnt in a CD and submit it to the department as per the instructions given by the teacher.

Reference Books:

1. Balasubramanium, T. 1981. A Textbook of Phonetics for Indian Students. New Delhi: Macmillan
2. Sethi, J. & P. V. Dhamija, 1997. A Course in Phonetics and Spoken English. New Delhi, Prentice-Hall
3. Crystal, David. 1985/ Rediscover Grammar with David Crystal . Longman
4. Bakshi, R. N. A Course in English Grammar . Orient Longman
5. Turton N.D., Heaton J. B.2004. Longman Dictionary of Common Errors. Pearson Longman

Course Title: Discrete Mathematics
Course Code: U-DIM-271

Total Lectures: 50 **Total Marks: 50**
Credits: 3

Learning Objectives
To extend student's mathematical maturity and ability to deal with abstraction and to introduce most of the basic terminologies used in computer science courses and application of ideas to solve practical problems. To provide fundamental ideas on graph theory required for the study of Computer Science.

Course Outcomes
At the end of the course, students would

- Have knowledge of the concepts needed to test the logic of a program.
- Understand basic notions of Graph Theory
- Knowing Fundamental Theorems in Graph Theory
- Study of algorithmic Graph Theory
- Have an understanding in identifying patterns on many levels.
- Be aware of a class of functions which transform a finite set into another finite set which relates to input output functions in computer science.

SYLLABUS

UNIT I:
1. SETS, RELATIONS AND FUNCTIONS

1.1. Definition and types of sets
1.2. Equal sets, subsets, universal sets, Venn diagram.
1.3. Set operations
1.4. Properties of set union and intersections
1.5. Cartesian product
1.6. Relation, types of relation
1.7. Function, domain, range, Types of function

UNIT II:
2. MATHEMATICAL LOGIC

2.1. Propositions
2.2. Truth values and truth table
2.3. Logical connectives and compound statements
2.4. Statement pattern and logical equivalence
2.5. Tautology, contradiction, contingency

UNIT III:
3. MATRICES AND DETERMINANTS

3.1. Definition of Determinant
3.2. Definition and types of matrices
3.3. Equality of Matrices and transpose of matrices
3.4. Algebra of matrices: addition, subtraction of matrices, scalar

3.5. Multiplication of matrix ·
3.6. Adjoint of matrices
3.7. Inverse of matrices

UNIT IV:

4. GRAPH THEORY

4.1. Definition and types of graphs
4.2. Incidences and degree of vertices
4.3. Isomorphism of graphs
4.4. Connected and disconnected graphs
4.5. Walks, paths and circuits
4.6. Directed graph
4.7. Tree
4.8. Centre of Tree
4.9. Binary Tree
4.10. Spanning tree
4.11. Cut sets and Cut vertices – Fundamental circuits and cut sets
4.12. Edge Connectivity - Vertex connectivity
4.13. Hamiltonian Paths & Graphs
4.14. Operations on graphs

REFERENCE BOOKS:

1. Elements of Discreet Mathematics by C.L. Liu
2. Discreet Mathematics by Olympia Nicodemi
3. Mathematical Structures for Computer Science by Alon Doerr and k. Levasieur
4. A first step in graph theory by Raghunathan, Nimkar & Solapurkar
5. Graphs theory with applications to computer science by Narsing Deo
6. Basic Mathematics by Mittal and Agarwal
7. Discrete Mathematical Structures with Application to Computer Science", Tremblay and Manohar", McGraw Hill Book Company.

Course Title: Database Management System
Course Code: U-DBM-272

Total Lectures: 50 **Total Marks: 50**
Credits: 3

Learning Objectives

- To implement the design of the tables in DBMS
- To write queries to get optimized outputs
- To store, retrieve and view the contents
- To generate report based on customized need

Course Outcomes

Upon successful completion of the course, students would be able to :

- Identify the information that is needed to design a database management system for a business information problem.
- Create conceptual and logical database designs for a business information problem.
- Construct a database management system that satisfies relational theory and provides users with business queries, business forms, and business reports.
- Analyze the core terms, concepts, and tools of relational database management systems.
- Demonstrate skills to work in teams in teams and utilize effective group techniques to manage a complex project.

SYLLABUS

UNIT I:

1. Introduction to Database

1.1. Definition of DBMS, File processing Vs DBMS
1.2. Advantages and disadvantages of DBMS
1.3. Users of DBMS
1.4. DBMS Structure

2. Elements of DBMS

2.1. DBMS Languages: DDL, DML, DCL
2.2. Terms: Entity, Entity set, attributes
2.3. Keys: Primary, secondary, foreign, composite

UNIT II:

3. Data Models

3.1. Introduction, Object based logical model,
3.2. Record based logical model (RDB, NDB, HDB)
3.3. E-R model, E-R diagram

4. Relational Algebra and Calculus

4.1. Introduction
4.2. Relation, Schemes, Domain, Tuples
4.3. Cardinality degree
4.4. Algebraic operation
4.5. Fundamental operation: Select, product, union
4.6. Set difference: Natural join, Cartesian product, rename
4.7. Relational calculus: Tuple and domain relational calculus

UNIT III:

5. Relational Database Design
5.1. Normalization: INF, 2NF, 3NF, BCNF
5.2. Class diagrams and E-R tables
5.3. Functional dependency
6. SQL
6.1. Data types
6.2. Table Creation, Modify
6.3. Selecting, Deleting records
6.4. Simple queries
6.5. Oracle constraints

UNIT IV:
7. Use of Operators
7.1. Comparison operators
7.1.1. Between, In, Not In, Like, Null
7.2. Logical operators
7.2.1. AND, OR, NOT
8. Advance in SQL
8.1. SQL function
8.2. Joins (Self and equi)
8.3. Sub-queries
8.4. Views

Reference Books:

1. "Database System Concepts" by Abraham Silberschatz, Henry Korth, and S. Sudarshan
2. "Database Management Systems" by Raghu Ramakrishnan

Course Title: Advance 'C'
Course Code: U-ADC-273

Total Lectures: 50 **Total Marks: 50**
Credits: 3

Learning Objectives:
On completion of the course, the student should know about

- Techniques for solving problems
- Basic computational concepts and elementary data structures
- The edit-compile-link-run cycle from a user point of view
- Testing strategies
- The main activities of software development and their interactions, and some of the major problems of software development.
- Hand-execute simple programs, showing how input data is processed, output data is produced, and how the values of internal variables change
- Explain at various levels the behavior of fragments of programming language code

Course Outcomes:
On successful completion of the course the students will be able to:

- Identify the parts of the computer system.
- Adequately explain functioning of computer components.
- Explain the process of problem solving using computer
- Design an algorithmic solution for a given problem
- Write a maintainable C program for a given algorithm.
- Trace the given C program manually.
- Write C program for simple applications of real life using structures and files.
- Explain role of Operating system in computer system and applications of computer networks.

SYLLABUS

UNIT I: Pointer, Structure & Union

CHAPTER: 1. Pointer & Dynamic Memory Allocation

1.1. Pointer to Pointer
1.2. Pointer & Functions
1.3. Pointer & Array
1.4. Array of Pointer
1.5. Dynamic Memory Allocation,
  1.5.1. Introduction to calloc( ), malloc( ), free( )

CHAPTER: 2. Structure & Union

2.1 Introduction of structure,
2.2 Declaration & initialization.
2.3 Arrays of Structures, Structure within structure.
2.4 Introduction to Union.
2.5 Declaration & initialization.

UNIT II: File Handling and Bit Operations

CHAPTER: 3. File Handling

3.1 Why we need a file,
3.2 File operations(create, open, read, move , write, close),
3.3 File opening Mode,
3.4 Closing a file,
3.5 Input/output operations,
3.6 Creating and reading a file

CHAPTER: 4. Bit Operations

4.1 One's Compliment operator
4.2 Right shift Operator
4.3 Left Shift Operator
4.4 Bit wise operator- AND, OR, XOR.

UNIT III: Interaction with Hardware through 'C' and VDU Basic

CHAPTER: 5. Interaction with Hardware through 'C'

5.1 Interrupt & Interrupt Vector table,
5.2 ROMBIOS Philosophy,
5.3 Invoking ROMBIOS function
5.4 int 86 ( ) function,
5.5 Interrupts to access ROMBIOS Services

CHAPTER: 6. VDU Basic

6.1 Components of VDU, Monitors & Display Adaptors,
6.2 Video Display Modes:
- Text or Graphics,
- colors in text mode,
- colors in graphics mode,
- colors in SVGA, Video page,

6.3 Writing to video memory in text mode,
6.4 Video interrupt services:
- set video mode (0h),
- set cursor size(1h),
- set cursor position(2h)

UNIT IV: Keyboard, Mouse programming and Introduction to C++

CHAPTER 7. Keyboard and Mouse Programming

7.1 Operation of keyboard ,Shift and toggle keys
7.2 keyboard interrupt(16 h)- get keyboard next character(0 h)
7.3 Mouse interrupt (33h),reset mouse (0h)
7.4 Show mouse pointer(1h), Hide mouse pointer(2h),
7.5 set mouse position and button status(3h).

8. Introduction to C++

8.1 Object oriented concepts, Features,
8.2 Advantages and Applications of OOPS
8.3 Data types, new operators and keywords, type conversion in C++
8.4 Classes & Objects

REFERENCE BOOKS:

1. Microprocessor System, the 8086/8088 family Architecture, programming & design By Chengliu A Gibson.
2. Let us C by Yeshwant Kanetkar 3rd Edition
3. Pointers In C By Yeshwant Kanetkar 3rd Edition

Course Title: Web Technology
Course Code: U-WET-274

Total Lectures: 50 **Total Marks: 50**
Credit: 3

Learning Objective:
The course has been designed to provide the basic knowledge for design of the web page / site.

Course Outcomes:
On successful completion of the course the students will be able to:

- A website is Published using application Server i.e. Tomcat/ IIS
- Apply Java script Code to sites.
- Develop Motion Graphic with Flash.
- Apply proper layout and interactive website design

SYLLABUS

UNIT I:

1. Web Publishing
1.1. Phases of website development
1.2. Web browser
1.3. Cross browser testing
1.4. How to publish a website
1.5. Web server
1.6. WWW
1.7. URL

2. HTML Document
2.1. Overview
2.2. Rules & Guidelines of HTML
2.3. Structure of HTML document

3. The Markup Tags
3.1. Basic HTML Tags
3.2. Physical style tags
3.3. Paragraphs
3.4. Lists
3.5. Font
3.6. HR
3.7. Heading levels
3.8. Center
3.9. Div, Span, Address

UNIT-II

4. Linking
4.1. Hyperlinks
4.2. Mailto anchor

5. Inserting images

5.1. Image file formats
5.2. <img> tag with its attributes
5.3. Images as background
5.4. Internal and External images
5.5. Image map: server side and client side image maps
5.6. Image as hyperlink

6. Adding multimedia Elements

6.1. Audio file formats
6.2. Adding audio in html document
6.3. Video file formats
6.4. Adding video in html document

UNIT III:

7. Tables

7.1. <table> tag with its attributes
7.2. Rowspan, colspan
7.3. Table element
7.4. Frames, Overview of frames
7.5. <frameset> tag and all attributes
7.6. Frame targeting
7.7. Floating frames
7.8. Forms, <form> tag with its attributes, Form controls
7.9. <input> tag with its attributes

UNIT IV:

8. DHTML

8.1. DOM
8.2. Moving objects in DHTML
8.3. CSS (All types)

9. Vbscript and Javascript

9.1. Adding script to document
9.2. Working with local and global variable
9.3. Vbscript
- Data types
- Operators
- Some inbuilt function
- Control statements
- Looping statements

9.4. Javascript
- Data types
- Operators
- Control statements
- Looping statements

10. Introduction to ASP

10.1. Introduction to active server pages
10.2. Installation of IIS server
10.3. Basic ASP script

Reference Books:

1. Web Publishing by Monica D'Souza
2. HTML & CSS: The Complete Reference, Fifth Edition, by Thomas Powell

Course Title: Lab Course V (DM)
Course Code: U-LAC-275

Total Marks: 50 **Credits: 2**

Learning Objectives

To extend student's mathematical maturity and ability to deal with abstraction and to introduce most of the basic terminologies used in computer science courses and application of ideas to solve practical problems. To provide fundamental ideas on graph theory required for the study of Computer Science.

Course Outcome

At the end of the course, students would

- Have knowledge of the concepts needed to test the logic of a program.
- Understand basic notions of Graph Theory
- Knowing Fundamental Theorems in Graph Theory
- Study of algorithmic Graph Theory
- Have an understanding in identifying patterns on many levels.
- Be aware of a class of functions which transform a finite set into another finite set which relates to input output functions in computer science.

Proposed Practical List:

1. Set and types of sets
2. Relation and types of relations
3. Function and types of functions.
4. Logical connectives and truth tables
5. Creating matrix
6. Types of matrices and algebra of matrices
7. Inverse and adjoint matrix
8. Graph theory
9. Types of graph theory
10. Study of Tree

Course title: Lab Course VI (DBMS)
Course code: U-LAC-276

Total Marks: 50 **Credits: 2**

Learning Objectives

- To implement the design of the tables in DBMS
- To write queries to get optimized outputs
- To store, retrieve and view the contents
- To generate report based on customized need

Course Outcomes

Upon successful completion of the course, students would be able to:

- Identify the information that is needed to design a database management system for a business information problem.
- Create conceptual and logical database designs for a business information problem.
- Construct a database management system that satisfies relational theory and provides users with business queries, business forms, and business reports.
- Analyze the core terms, concepts, and tools of relational database management systems.
- Demonstrate skills to work in teams in teams and utilize effective group techniques to manage a complex project.

Proposed Practical List:

1. Study of Data Definition Language (DDL) commands
2. Study of Data Manipulation Language (DML) commands
3. Study of Data Control Language (DCL) commands
3. Study of data constraints
6. Study of numeric and character functions
7. Study of logical, relational and arithmetic operators
8. Study of views
9. Study of Join and its types
10. Study of subquery
11. Database design using E-R model and Normalization.
12. Design and implementation of Payroll Processing System.
13. Design and implementation of Banking System.
14. Design and implementation of Library Information System.

Course Title: Lab Course VII (Adv. C)
Course Code: U-LAC-277

Total Marks: 50 **Credits: 2**

Learning Objectives:

On completion of the course, the student should Knowledge - know about:

- Techniques for solving problems
- Basic computational concepts and elementary data structures
- The edit-compile-link-run cycle from a user point of view
- Testing strategies
- The main activities of software development and their interactions, and some of the major problems of software development.
- Hand-execute simple programs, showing how input data is processed, output data is produced, and how the values of internal variables change
- Explain at various levels the behavior of fragments of programming language code

Course Outcomes:

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

- Identify the parts of the computer system.
- Adequately explain functioning of computer components.
- Explain the process of problem solving using computer
- Design an algorithmic solution for a given problem
- Write a maintainable C program for a given algorithm.
- Trace the given C program manually.
- Write C program for simple applications of real life using structures and files.
- Explain role of Operating system in computer system and applications of computer networks.

Proposed Practical List:

1. Program to demonstrate the concept of Pointer.
2. Program to demonstrate the concept of Pointer to Pointer.
3. Program to demonstrate the concept of command line argument.
4. Program to demonstrate the concept of structure.
5. Program to demonstrate the concept of union.
6. Program to demonstrate the concept of file operations.
7. Program to demonstrate the concept of bitwise operations.
8. Program to demonstrate the concept of int86().
9. Program to set video mode.
10. Program to demonstrate the cursor size(1h).
11. Program to read the cursor position.
12. Program to demonstrate the concept of keyboard interrupt.
13. Program to demonstrate the concept of mouse interrupt.
14. Program for introduction of C++.
15. Program in C++ to demonstrate the concept of class and objects

Course Title: Lab Course VIII (WT)
Course Code: U-LAC-278

Total Marks: 50 **Credits: 2**

Learning Objective:

The course has been designed to provide the basic knowledge for design of the web page /site.

Course Outcomes:

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

- A website is Published using application Server i.e. Tomcat/ IIS
- Apply Java script Code to sites.
- Develop Motion Graphic with Flash.
- Apply proper layout and interactive website design

Proposed Practical List:

1. Design web pages for your college containing a description of the courses, departments, faculties, library etc, use href, list tags.
2. Create your class timetable using table tag.
3. Create user Student feedback form (use textbox, text area , checkbox, radio button, select box etc.)
4. Create a web page using frame. Divide the page into two parts with Navigation links on left hand side of page (width=20%) and content page on right hand side of page (width = 80%). On clicking the navigation Links corresponding content must be shown on the right hand side.
5. Write html code to develop a webpage having two frames that divide the webpage into two equal rows and then divide the row into equal columns fill each frame with a different background color.
6. Create your resume using HTML tags also experiment with colors, text, link, size and also other tags you studied.
7. Design a web page of your home town with an attractive background color, text color, an Image, font etc. (use internal CSS).
8. Use Inline CSS to format your resume that you created.
9. Use External CSS to format your class timetable as you created.
10. Use External, Internal, and Inline CSS to format college web page that you created.
11. Develop a JavaScript to display today's date.
12. Develop simple calculator for addition, subtraction multiplication and division operation using JavaScript