SREE VAHINIINSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)
TIRUVURU – 521235, ANDHRA PRADESH, INDIA

ACADEMIC REGULATIONS

COURSE STRUCTURE & DETAILED SYLLABUS

For

Bachelor of Computer Applications (BCA)

(Applicable for the batches admitted from 2024-25)

SREE VAHINIINSTITUTE OF SCIENCE AND TECHNOLOGY

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Bachelor of Computer Applications
COURSE STRUCTURE

I Year - I SEMESTER						
S.No	**Category**	**Course**	**L**	**T**	**P**	**Credits**
1	AEC-1	Communicative English	3	0	0	3
2	VAC	Computer Fundamentals	3	0	0	3
3	MD	Fundamentals of Commerce	2	0	0	2
4	CORE	Digital Logic Design.	3	0	0	3
5	CORE	Programming in C	3	0	0	3
6	MD	Numerical and Statistical Methods	3	0	0	3
7	AEC-2	Communication Skills Lab	0	0	3	1.5
8	VAC	Office Automation Tools Lab	0	0	3	1.5
9	CORE	Programming in C Lab	0	0	3	1.5
10	MD	Statistics using R Lab	0	0	3	1.5
Total Credits			**17**	**0**	**12**	**23**

I Year - II SEMESTER						
S.No	Category	Course	L	T	P	Credits
1	MD	Discrete Mathematics.	3	0	0	3
2	VAC	Environmental Science	2	0	0	2
3	MD	Business Organization	3	0	0	3
4	CORE	Computer Organization	3	0	0	3
5	CORE	Data Structures	3	0	0	3
6	CORE	OOP's through C++	3	0	0	3
7	CORE	Data Structures through C Lab.	0	0	3	1.5
8	VAC	Indian Constitution	2	0	0	2
9	CORE	OOP's through C++ Lab	0	0	3	1.5
Total Credits			**19**	**0**	**6**	**22**

L	T	P	C
3	**0**	**0**	**3**

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I Year I Semester

COMMUNICATIVE ENGLISH

Course Objectives:

The main objective of introducing this course, Communicative English, is to facilitate effective listening, Reading, Speaking and Writing skills among the students. It enhances the same in their comprehending abilities, oral presentations, reporting useful information and providing knowledge of grammatical structures and vocabulary. This course helps the students to make them effective in speaking and writing skills and to make them industry. ready.

UNIT I

Lesson: HUMAN VALUES: Gift of Magi (Short Story)

Listening: Identifying the topic, the context and specific pieces of information by listening to short audio texts and answering a series of questions.

Speaking: Asking and answering general questions on familiar topics such as home, family, work, studies and interests, introducing oneself and others, Reading: Skimming to get the main idea of a text, scanning to look for specific pieces of information.

Writing: Mechanics of Writing-Capitalization, Spellings, Punctuation-Parts of Sentences.

Grammar: Parts of Speech, Basic Sentence Structures-forming questions

Vocabulary: Synonyms, Antonyms, Affixes (Prefixes/Suffixes), Root words.

UNIT II

Lesson: NATURE: The Brook by Alfred Tennyson (Poem)

Listening: Answering a series of questions about main ideas and supporting ideas after listening to audio texts.

Speaking: Discussion in pairs/small groups on specific topics followed by short structure talks. Reading: Identifying sequence of ideas, recognizing verbal techniques that help to link the ideas in a paragraph together.

Writing: Structure of a paragraph Paragraph writing (specific topics)

Grammar: Cohesive devices linkers, use of articles and zero article; prepositions.

Vocabulary: Homonyms, Homophones, Homographs.

UNIT III

Lesson: BIOGRAPHY: Elon Musk

Listening: Listening for global comprehension and summarizing what is listened to Speaking: Discussing specific topics in pairs or small groups and reporting what is discussed

Reading: Reading a text in detail by making basic inferences recognizing and interpreting specific context clues, strategies to use text clues for comprehension.

Writing: Structure of a paragraph Paragraph writing (specific topics)

Grammar: Cohesive devices linkers, use of articles and zero article; prepositions.

Vocabulary: Homonyms, Homophones, Homographs.

UNIT IV

Lesson: INSPIRATION: The Toys of Peace by Saki

Listening: Making predictions while listening to conversations/ transactional dialogues without video, listening with video.

Speaking: Role plays for practice of conversational English in academic contexts (formal) and informal) asking for and giving information/directions.

Reading: Studying the use of graphic elements in texts to convey information, reveal trends/patterns/relationships, communicate processes or display complicated data.

Writing: Letter Writing Official Letters, Resumes

Grammar: Reporting verbs, Direct & Indirect speech, Active & Passive Voice

Vocabulary: Words often confused, Jargons

UNIT V

Lesson: MOTIVATION: The Power of Intrapersonal Communication (An Essay)

Listening: Identifying key terms, understanding concepts and answering a series of relevant. questions that test comprehension. Speaking: Formal oral presentations on topics from academic contexts.

Reading: Reading comprehension.

Writing: Writing structured essays on specific topics.

Grammar: Editing short texts -identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject verb agreement)

Vocabulary: Technical Jargons

Textbooks:

1. Pathfinder: Communicative English for Undergraduate Students, 1st Edition, Orient Black Swan, 2023 (Units 1,2&3)

2. Empowering with Language by Cengage Publications, 2023 (Units 4 & 5)

Reference Books:

1. Dubey, Sham Ji& Co. English for Engineers, Vikas Publishers, 2020

2. Bailey, Stephen. Academic writing: A Handbook for International Students. Routledge, 2014.

3. Murphy, Raymond. English Grammar in Use, Fourth Edition, Cambridge University Press, 2019.

4. Lewis, Norman. Word Power Made Easy The Complete Handbook for Building a Superior Vocabulary. Anchor, 2014.

Web Resources:

GRAMMAR:

1. www.bbc.co.uk/leamingenglish

2. https://dictionary.cambridge.org/grammar/british-grammar/

3. www.eslpod.com/index.html

4. https://www.leamgrammar.net/

5. https://english4today.com/english-grammar-online-with-quizzes/

6. https://www.talkenglish.com/grammar/grammar.aspx

VOCABULARY

1. https://www.youtube.com/c/DailyVideoVocabulary/videos

2. https://www.youtube.com/channel/UC4cmBAit8i_NJZE8qK8sfpA

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3	0	0	3

I Year I Semester

COMPUTER FUNDAMENTALS

Course Objectives:

The main objective of this course is to introduce the fundamentals of computing devices and the Internet, It focuses on computer literacy that prepares students for life-long learning of computer concepts and skills.

Unit I:

Knowing computer: computer definition, applications of computer, components of a computer system, Central Processing Unit(CPU), Video Display Unit, Keyboard and Mouse, Optical Storage devices, basics of hard drive, concepts of hardware and software, concept of computing, data and information, applications of information electronics and communication technology, connecting keyboard, mouse, monitor and printer to CPU and checking power supply

Computer software & its types: system software, application software, types of operating system, role of operating system, utility programs, packages, communication software, commonly used application software

Unit II:

Operating computer using GUI based operating system: operating systems basics, basics of popular operating systems, the user interface, basics of operating system setup, common utilities

MS Windows Operating System: definition and functions, basic components of Windows, Icons, Desktop, Taskbar, Notification area, files and folders, start menu operations, my computer, network neighbourhood, recycle bin, windows explorer, setting wall paper, creating. copying, moving and deleting files, changing the mouse pointer, paint, notepad, setting date and time, screen saver, using mouse: using right mouse button moving icons on the screen, use of common icons, status bar, using menu and menu selections, running an application, viewing of files, folder sand directories, creating and renaming of files and folders, opening and closing of different windows, using help, crating shortcuts, using Windows accessories.

Unit III:

MS-Word: introduction, Windows interface, document views, creating & editing documents, selecting, deleting, replacing text, copying text to another file, formatting text, paragraphs, fonts, paragraph formatting using bullets and numbering, dialog box, checking spellings, line

spacing, margins, space before and after paragraph, mail merge, macros, printing documents, print preview

MS Excel: introduction, workbook, worksheet, formatting, formulas, charts MS Power point: introduction, creating presentation with all options, slide show, animations and designs

Unit IV:

Introduction to Internet, WWW, Web browsers.

Basics of computer networks, LAN, WAN, concept of Internet, web browsing software, search engines, understanding URLs, domain name, IP address Basies of electronic mail, getting and email account, sending and receiving mails, document collaboration

Unit V:

Useful Google tools such as drive, sheet, doc, meet etc., Firewall, computer virus, Anti virus software, Intemet security and privacy. Basics of Electronic Data Interchange, Electronic Payment systems, Types of payment systems, digital cash, electronic cheque, smart card, introduction to digital signatures

Text Books:

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education

2. Computer Fundamentals, A. Goel, 2010, Pearson Education.

3. Fundamentals of Computers, P. K.Sinha& P. Sinha, 2007, BPB Publishers,

4. Fundamentals of Information Technology: Alexis Leon & Mathews Leon, Vikas Publishing House, New Delhi

5. IT Tools, R.K. Jain, Khanna Publishing House

6. Introduction to Information Technology. Satish Jain, AmbrishRai&Shashi Singh, Paperback Edition, BPB Publications, 2014.

Web Resources:

1. https://edu.gefglobal.org/en/computerbasics/

2. https://edu.gofglobal.org/en/subjects/office/

3. https://onlinecourses.swayam2.ac.in/nou20 cs03/

4. https://tutorialpoint.com/computer_fundamental/index.htm

5. https://nptel.ac.in/courses/106/103/106103068/

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2	0	0	2

I Year I Semester

FUNDAMENTALS OF COMMERCE

Course Objectives:

The objective of this paper is to help students to acquire conceptual knowledge of the Commerce, Economy and Role of Commerce in Economic Development. To acquire Knowledge on Accounting and Taxation

Unit I:

Introduction: Definition of Commerce, Role of Commerce in Economic Development, Role Commerce in Societal Development. Imports and Exports, Balance of Payments. World Trade Organization.

Unit II:

Economic Theory: Macro Economics, Meaning, Definition, Measurements of National Income, Concepts of National Income. Micro Economics, Demand and Supply. Elasticity of Demand and Supply. Classification of Markets, Perfect Competition, Characteristics, Equilibrium Price, Marginal Utility.

Unit III:

Accounting Principles: Meaning and Objectives Accounting, Accounting Cycle, Branches of Accounting, Financial Accounting, Cost Accounting, Management Accounting Concepts and Conventions of Accounting-GAAP.

Unit IV:

Taxation: Meaning of Tax, Taxation, Types of Tax, Income Tax, Corporate Taxation, GST. Customs & Exercise. Differences between Direct and Indirect Tax, Objectives of Tax, Concemed authorities, Central Board of Direct Taxes (CBDT) and Central Board of Excise and Customs (CBIC),

Unit V:

Computer Essentials: Web Design, Word Press Basics, Developing a Simple Website. Digital Marketing, Social Media Marketing, Content Marketing, Search Engine Optimization (SEO), E-mail Marketing. Data Analytics, Prediction of customer behavior, customized suggestions.

Reference Books:

1. S.P. Jain & K.L. Narang, Accountancy 1 Kalyani Publishers.

2. R.L. Gupta & V.K. Gupta, Principles and Practice of Accounting, Sultan Chand

3. Business Economics-S. Sankaran, Margham Publications, Chennai.

4. Business Economics Kalyani Publications.

5. Dr. Vinod K. Singhania: Direct Taxes-Law and Practice, Taxmann Publications.

6. Dr. Mehrotra and Dr. Goyal: Direct Taxes-Law and Practice, SahityaBhavan Publications

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I Year I Semester

DIGITAL LOGIC DESIGN

Course Objectives:

The main objectives of the course are to

- Understand different methods used for the simplification of Boolean functions and binary arithmetic.
- Design and implement combinational circuits, synchronous & asynchronous sequential circuits

UNIT 1:

Binary Systems: Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic.

Boolean Algebra and Logic Gates: Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Digital Logic Gates.

UNIT II:

Minimization: K-Map Method-Tabulation Method, POS SOP, Don't Care Conditions. NAND, NOR Implementation.

Combinational Logic: Combinational Circuits, Analysis and Design Procedure, Binary Adder, Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers.

UNIT III:

Synchronous Sequential Logic: Sequential Circuits Latches, Flip-Flops, An analysis of Clocked Sequential Circuits, State Reduction and Assignment Design Procedure.

UNIT IV:

Registers and Counters: Registers, Shift Registers, Ripple Counters, Synchronous Counters, Ring Counters-Johnson Counter.

UNIT V:

Asynchronous Sequential Circuit: Introduction, Analysis Procedure, Circuits with Latches, Design Procedure.

Text Books:

1. M. Monis Mano, "Digital Design", 3rd edition, Pearson Education, Delhi, 2007. 2. Carl Hamacher, Z. Vranesic, S. Zaky: Computer Organization, 5/e (TMH)

Reference Books:

1. Donald P Leech, Albert Paul Malvino and GoutamSaha, "Digital Principles and Applications", Tata McGraw Hill, 2007.

Web Resources:

1. https://nptel.ac.in/courses/117105080

2. Digital Logic Design: Theory (CS226) + Lab (CS254) (iitb.ac.in)

3. Free Course: Digital Logic and Circuits Simulations from Banaras Hindu University Class Central

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I Year I Semester

PROGRAMMING IN C

Course Objectives:

The main objectives of the course is to

- Introduce students to the fundamentals of computer programming.
- Provide hands-on experience with coding and debugging.
- Foster logical thinking and problem-solving skills using programming.
- Familiarize students with programming concepts such as data types, control
- structures, functions, and armys.
- Encourage collaborative leaming and teamwork in coding projects.

UNIT I :

Introduction to Programming and Problem Solving: History of Computers, Basic organization of a computer: ALU, input-output units, memory, program counter, Introduction. to Programming Languages, Basics of a Computer Program Algorithms, flowcharts (Using Dia Tool), pseudo code. Introduction to Compilation and Execution, Primitive Data Types, Variables, and Constants, Basic Input and Output, Operations, Type Conversion, and Casting. Problem solving techniques: Algorithmic approach, characteristics of algorithm, Problem solving strategies: Top-down approach, Bottom-up approach, Time and space complexities of algorithms.

UNIT II:

Control Structures: Simple sequential programs Conditional Statements (if, if-else, switch), Loops (for, while, do-while) and Unconditional statements: goto, Break and Continue.

UNIT III:

Arrays and Strings: Arrays indexing, memory model, programs with array of integers, two dimensional arrays, Introduction to Strings and string Operations

UNIT IV:

Pointers & User Defined Data types: Pointers, dereferencing and address operators, pointer and address arithmetic, array manipulation using pointers. User-defined data types-Structures and Unions.

UNIT V:

Functions & File Handling: Introduction to Functions, Function Declaration and Definition, Function call Return Types and Arguments, modifying parameters inside functions using pointers, arrays as parameters, Recursive functions. Scope and Lifetime of Variables, Basics of File Handling

Text Books:

1. E. Balagurusamy. "Programming in ANSI C", 4/e, TMH

2. DrN B Venlateswarlu, " C Programming", S Chand Publications

3. Yashwant Kanetkar, "Let Us C: Authentic guide to C programming language", 19 Edition, BPB publications

4. B. Kemighan & Dennis Ritchie, "The C Programming Language", 2/e PHI

Reference Books:

1. Paul Deitel, Harvey Deitel, "C; How to Program", 8/e, Prentice Hall.

2. Schaum's Outline of Programming with C. Byron S Gottfried, McGraw-Hill Education, 1996

Web Resources:

1. Introduction to Programming in C Course (nptel.ac.in)

2. Lecture Notes | Practical Programming in C | Electrical Engineering and Computer Science | MIT OpenCourseWare

3. https://nptel.ac.in/courses/106105171

4. http://eslibrary.stanford.edu/

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I Year I Semester

NUMERICAL AND STATISTICAL METHODS

The main objectives of the course are:

UNIT 1:

- To learn how to perform error analysis for arithmetic operations.
- To demonstrate working of various numerical methods.
- To provide a basic understanding of the derivation and use of methods of
- interpolation and numerical integration.
- To impart knowledge of various statistical techniques.
- To develop students understanding through laboratory activities to solve problems related to above stated concepts.

UNIT I:

Solution of equations (polynomial and transcendental equations) interval having methods, secant, Regula-Falsi, Newton-Raphson methods, Fixed point Iteration method.

UNIT II:

Solution of system of linear equations: Gauss-Elemination method, Gauss-Jordan, Gauss-Siedel iteration method, LU. Decomposition method, Eigen values and Eigen vectors of a square matrix.

UNIT III:

Interpolation: Forward and backward differences, Newton's forward and backward formula, Lagrange's interpolation and Lagrange's inverse interpolation formula. Numerical differentiation, integration Numerical differentiation forward and backward formula, Trapezoidal and Simpsons formulas.

UNIT IV:

Basic concepts and definition of statistics Mean Median, Mode, standard deviation coefficient of variation, skewness and kurtosis, Karl Pearson Correlation coefficient, Rank Correlation and illustrated examples.

UNIT V:

Probability: Basic concepts and definition of probability. Probability axioms, Conditional probability Addition and Multiplication theorem of probability (Based on set theory concepts), Bayes theorem, problems and applications.

Text Books:

1. Sunil S. Patil Numerical and Statistical Methods EBPB.

2. S.S. Shastry Introductory methods of Numerical Analysis PHI (New Delhi).

Reference Books:

1. Gupta S.C &Kapuram VK Fundamentals of Mathematical Statistics.

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0	0	3	1.5

I Year I Semester

COMMUNICATION SKILLS LAB

Course Objectives:

The main objective of introducing this course, Communicative English Laboratory, is to expose the students to a variety of self-instructional, leamer friendly modes of language leaming. The students will get trained in basic communication skills and also make them ready to face job interviews.

List of Topics:

1. Vowels & Consonants

2. Neutralization/Accent Rules

3. Communication Skills & JAM

4. Role Play or Conversational Practice

5. E-mail Writing

6. Resume Writing, Cover letter, SOP 7. Group Discussions-methods & practice

8. Debates Methods & Practice

9. PPT Presentations/ Poster Presentation

10. Interviews Skills

Suggested Software:

- Walden Infotech
- Young India Films

Reference Books:

1. Raman Meenakshi, Sangeeta-Sharma. Technical Communication. Oxford Press, 2018, 2. Taylor Grant: English Conversation Practice, Tata McGraw-Hill Education India, 2016

3. Hewing's, Martin Cambridge Academic English (B2), CUP, 2012.

4. J. Sethi& P.V. Dhamija. A Course in Phonetics and Spoken English, (2nd Ed), Kindle. 2013

Web Resources:

Spoken English:

1. www.esl-lab.com
2. www.englishmedialab.com
3. www.englishinteractive.net
4. https://www.britishcouncil.in/english/online
5. http://www.letstalkpodcast.com/
6. https://www.youtube.com/c/mmmEnglish_Emma/featured
7. https://www.youtube.com/c/ Arnels Everyday English/featured
8. https://www.youtube.com/c/engvidAdam/featured
9. https://www.youtube.com/c/English Class101/featured
10. https://www.youtube.com/c/SpeakEnglish With Tiffani/playlists
11. https://www.youtube.com/channel/UCV1h_cBE0Drdx 19qkTM0WNw

Voice & Accent:

1. https://www.youtube.com/user/letstalkaccent/videos
2. https://www.youtube.com/c/EngLanguageClub/featured
3. https://www.youtube.com/channel/UC_OskgZBoS4dAnVUgJVexc
4. https://www.youtube.com/channel/UCNfm92h83W2i2ijc5Xwp_IA

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0	0	3	1.5

I Year I Semester

OFFICE AUTOMATION TOOLS LAB

Course Objectives:

- To introduce the environment of GUI in Ms-Word and its features..
- To introduce the fundamental concepts using Ms-Word and its features to make it more useful.
- To provide hands-on use of Word, Excel and PowerPoint.

Task 1: Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Task 2: Every student should disassemble and assemble the PC back to working condition.

Experience the following: Binary Arithmetic (https://scratch.mit.edu/projects/613350058) Full adder circuit (https://logic.ly/demo/andhttps://logic.ly/demo/samples). This app is to test unsigned binary numbers to decimal number conversion skill of the students. https://scratch.mit.edu/projects/621571989

Task 3: Installation of MS windows on the personal computer.

Task 4: Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

Task 5: Creation of Gmail account, accessing Google Drive including Google Docs

Task 6: Create a document to write a letter to the DM&HO of the district complaining about Hygienic conditions in your area. (*Similar Letters)

Task 7: Create a document to share your experience of your recent vacation with family.

Task 8: Create a document to send a holiday intimation to all the parents at time about Dasam Vacation. (using mail merge)

Task 9: Create a document to create Time Table of you class using tables.

Task 10: Create a table with following columns and display the result in separate cells for the following

Emp Name, Basic pay, DA, HRA, Total salary.

- Sort all the employees in ascending order with the name as the key

- Calculate the total salary of the employee
- Calculate the Grand total salary of the employee

Task 11: Create two pages of curriculum vitae of a graduate with the following specifications

- Table to show qualifications with proper headings
- Appropriate left and right margins
- Format pageusingtwo-columnapproachabout yourself
- Name on each page at the top right side
- Page no in the footer on the right side

Task 12: Create a letter as the main document and create 10 records for the 10 persons. Use mail merge to create letter for selected persons among 10.

Task 13: Create a worksheet with you class marks displaying total, average, top marks in the class and least marks in the class

Task 14: Create a Worksheet with employee no, name, job, salaries of 10 employees, calculate DA.TA,HRA, Gross Salary and Net Salary,

i. Find the sum of HRA's of Total employees.

ii. Find the average DA

ii. Display the Maximum salary of the employee.

Task 15: Prepare a chart with height and weights of you class mates in at least 3 types of charts.

Task 16: Demonstrate the use of Filter with the attendance data of your class.

Task 17: Prepare a presentation with your achievements and experiences in College.

Task 18: Create a Presentation of your organization with pictures, clip arts and animations

Task 19: Create a presentation using templates.

Task 20: Create a Custom layout or Slide Master for professional presentation.

Task 21: Create a presentation with slide transitions and animation effects.

Task 22: Create a table in PPT and apply graphical representation

Text Books:

1. Computer Fundamentals-Pradeep K. Sinha: BPB Publications.

2. Joy of Computing: ABC of bits, trits, qubits, bytes, trytes, qutrits, quids for kids to Teachers, NB V Venkateswarlu, 2022

3. Fundamentals of Computers -Reema Thareja, Oxford University Press India

Web Resources:

1. https://onlinecourses.swayam2.ac.in/cgc21_cs15/preview

2. https://edu.gcfglobal.org/en/computerbasics/

3. https://www.computerhope.com/jargon/m/microsoft-word.htm

4. https://www.coursera.org/courses?query=office%20automation

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I Year I Semester

PROGRAMMING in C LAB

Course Objectives:

The course aims to give students hands on experience and train them on the concepts of the C- programming language.

UNIT I

Suggested Experiments/Activities

WEEK 1: Lab1: Familiarization with programming environment

i) Basic Linex environment and it editors like Vi, Vim and Emacs etc.,

ii) Exposure to Turbo C, gee

iv) Simple Arithmetic Operations

Basic Linux environment and its editors like Vi, Vim & Emacs etc.

Writing simple programs using using input and Output Statements

WEEK 2: Lab2: Converting algorithms/flow charts into C Source code. Developing the algorithms/flowcharts for the following sample programs

1) Simple statistics Operations Sum and average etc

in) Conversion of Fahrenheit to Celsius and vice versa

m) Simple and Compound Interest calculation

WEEK 3: Lab 3: Simple computational problems using arithmetic expressions.

i) Finding the square root of a given number

i) Finding compound interest

iii) Area of a triangle using hero's formulae

iv) Distance travelled by an object.

WEEK 4: Lab 4: Simple computational problems using the operator precedence and associatively

i) Evaluate the following expressions.

a A+BC+(D*E) + F*G

b. A/B C-B+A D/3

c. A+++BA

d. J=(i++)+(++)

ii) Find the maximum of three numbers using conditional operator

WEEK 5: Lab 5: Problems involving if-then-else structures.

i) Find the max and min of four numbers using if-else.

ii) Generate electricity bill.

in) Find the roots of the quadratic equation.

iv) Simulate a calculator using switch case.

v) Find the given year is a leap year or not ete

WEEK 6: Lab 6: kerative problems e.g., series and sequences i) Find the factorial of given number using any loop.

ii) Find the given number is a prime or not,

iii) Checking a number is palindrome or not

WEEK 7: Lab 7:1D Array manipulation, linear search

i) Find the min and max of a 1-D integer array.

ii) Perform linear search onl D array.

iii) The reverse of a ID integer array

WEEK 8: Lab 8: Matrix problems, String operations

i) Addition of two matrices

ii) Multiplication two matrices

iii) Sort array elements

iv) Concatenate two strings without built-in functions

v) Reverse a string using built-in and without built-in string functions.

WEEK 9: Lab 9: Pointers and structures, memory dereference.

i) Write a C program to find the sum of a ID array using malloc()

ii) Write a C program to find the total, average of n students using structures

iii) Enter n students data using calloc() and display failed students list

WEEK 10: Lab10:

i) Demonstrate the differences between structures and unions using a C program.

i) Write a C program to copy one structure variable to another structure of the same type.

WEEK 11: Lab 11: Write a C program to swap two numbers (Use call by value and call by reference)

WEEK 12: Lab 12: Recursive functions

i) Generate Fibonacci series.

ii) Find the LCM of two numbers. ii) Find the factorial of a number.

WEEK 13: Lab 13: File operations

i) Write and read text into a file.

ii) Write and read text into a binary file

iii) Copy the contents of one file to another file.

iv) Find no, of lines, words and characters in a file

Text Books:

1. Ajay Mittal, Programming in C: A practical approach, Pearson.

2. Byron Gottfried, Schaum's Outline of Programming with C, McGraw Hill

3. Dr NB Venlateswarlu, " C Programming". S Chand Publications

Reference Books:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice- Hall of India

2. C Programming, A Problem Solving Approach, Forouzan,

Web Resources:

1. Department of Computer Science and Technology-Course pages 2021-22: Programming in Cand C++-Course materials (carn.ac.uk)

2. Practical Programming in C|Electrical Engineering and Computer Science | MIT

Open Course Ware

3. Lab 1: Introduction to CSystems, Networks, and Concurrency fanu.edu.au)

4. https://ps-inth.vlabs.ac.in/ 5. https://www.leam-c.org/

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I Year I Semester

STATISTICS USING R LAB

Exercise 0:

Installing R and R Studio

Basic functionality of R

Exercise 1:

a) Write an R. program to print Hello World

b) Write a program to demonstrate the basic Arithmetic in R

c) Write a program to demonstrate the Variable assignment in R

Exercise 2:

a)Write a program to demonstrate the data types in R

b) Write a program to demonstrate the creating and naming a vector in R

c) Write a program to demonstrate the create a matrix and naming matrix in R

Exercise 3:

a) Write a program to demonstrate the Add column and Add a Row in Matrix in R

b) Write a program to demonstrate the selection of elements in Matrixes in R

c) Write a program to demonstrate the Performing Arithmetic of Matrices

Exercise 4:

a) Write a program to demonstrate the Factors in R

b) Implement the Factor in R.

c) Write a program to illustrate Ordered Factors in R

Exercise 5:

a) Write an R program to take input from the user.

b) Write an R program to Check if a Number is Odd or Even

c) Write an R program to check if the given number is a Prime Number

Exercise 6:

a) Write an R program to Find the Factorial of a Number

b) Write an R program to Find the Factors of a Number

c) Write an R program to Find the Fibonacci sequence Using Recursive Function

Exercise 7:

a) Write an R program to make a Simple Calculator b) Write an R program to Find L.C.M of two numbers.

c) Write an R program to create a Vector and to access elements in a Vector

Exercise 8:

a) Write an R program to create a Matrix and access rows and columns using functions colnames() and rownames().

b) Write an R Program to create a Matrix using chind() and rhind() functions.

Exercise 9:

a) Write an R Program to create a Matrix from a Vector using the dim() function, b) Write an R Program to create a List and modify its components.

c) Write an R Program to create a Data Frame.

Exercise 10:

a) Write an R Program to access a Data Frame like a List.. b) Write an R Program to access a Data Frame like a Matrix.

c) Write an R Program to create a Factor.

Exercise 11:

a) Write an R Program to Access and Modify Components of a Factor.

b) Write an R Program to create an S3 Class and $3 Objects.

c) Write an R. Program to write an own generic function in S3 Class

Exercise 12:

a) Write an R Program to create an S4 Class and S4 Objects.

b) Write an R Program to write an own generic function in S4 Class. c) Write an R Program to create a reference class and modify its methods.

Exercise 13:

a) Write an R program to create a scatter plot for the data frame columns.

b) Write an R program to create a bar plot for the data frame columns.

c) Write an R program to create a box plot for the data frame columns.

Exercise 14:

a) Write an R program to add the legend to the plot.

b) Write an R program to change the width and height of the plot layout

e) Write an R program to calculate mean, mode, median and standard devotion

d) Implement R. Script to create a Pie chart, Bar Chart, scatter plot and Histogram.

Exercise 15:

a) Implement R Script to perform Normal, Binomial distributions.

b) Implement R. Script to perform correlation

References:

1. R Cookbook Paperback-2011 by Tector Paul O Reilly Publications

2. Beginning R: The Statistical Programming Language by Dr. Mark Gardener, Wiley.

Publications 3. R Programming For Dummies by Joris MeysAndrie de Vries, Wiley Publications

4. Hands-On Programming with R by Grolemund, O Reilly Publications

5. Statistical Programming in R by KG Srinivas G.M. Siddesh, Chetan Shetty&Sowmya B.J..

2017 edition 6. R Fundamentals and Programming Techniques, Thomas Lumely.

7. R for Everyone Advanced Analytics and Graphics, Jared P. Lander- Addison Wesley Series

8. The Art of R Programming, Norman Matloff, Cengage Leaming

Web Links:

1. URL: https://cran.r-project.org/doc/manuals/r-release/R-intro.pdf

2. http://nptel.ac.in/courses/106104135/48

3. http://nptel.ac.in/courses/110106064/

Software Requirements:

1. The R statistical software program. Available from: https://www.r-project.org/ 2. RStudio an Integrated Development Environment (IDE) for R. Available from: https://www.rstudio.com/

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II SEMESTER

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I Year II Semester

DISCRETE MATHEMATICS

Course Objectives:

* To learn the mathematical foundations for Computer Science.

* Topics covered essential for understanding various courses.

Unit-I:

Mathematical Logic: Propositional Calculus: Statements and Notations, Connectives, Well Formed Formulas, Truth Tables, Tautologies, Equivalence of Formulas, Duality Law, Tautological Implications, Normal Forms, Theory of Inference for Statement Calculus, Consistency of Premises, Indirect Method of Proof, Predicate Calculus: Predicates, Predicative Logic, Statement Functions, Variables and Quantifiers, Free and Bound Variables, Inference Theory for Predicate Calculus.

Unit-II:

Sets and Functions: Sets, Relations, Functions, Closures of Equivalence Relations, Partial ordering well ordering, Lattice, Sum of products and product of sums principle of Inclusions and Exclusions

Unit III:

Combinatory: Permutations, Combinations, Pigeonhole principle Recurrence Relation: Linear and Non-linear Recurrence Relations, Solving Recurrence Relation using Generating Functions.

Unit IV:

Graphs: Introduction to graphs, graphs terminologies, Representation of graphs, Isomorphism Connectivity & Paths: Connectivity, Euler and Hamiltonian Paths, Introduction to tree, tree traversals, spanning tree and tree searches: Breadth first search, Depth first search, cut-set, cut-vertex.

Unit-V:

Modeling Computation: Finite State Machine, Deterministic Finite Automata (DFA), Non-Deterministic Finite Automata (NFA), Grammars and Language, Application of Pumping Lemma for Regular Language.

Text Books:

1. Discrete Mathematics and its Applications with Combinatory and Graph Theory, 7th edition by Kenneth H. Rosen.

2. Discrete Mathematical Structures with Applications to Computer Science, J. P Tremblay, R. Manohar, TMH, 1997.

3. Elements of Discrete Mathematics-A Computer Oriented Approach, C. L. Liu and D. P. Mohapatra, 3rd Edition, Tata McGraw Hill.

4. Discrete Mathematics, An open Introduction, Oscar Levin, 3d edition

Reference Books:

1. Elements of Discrete Mathematics by C. L. Liu and D.P. Mohapatra, TMH, 2012

2. A Modern Approach to Discrete Mathematics and Structure by J. K. Mantri& T. KTripathy,Laxmi Publication

Web Resources:

1. https://onlinecourses.nptel.ac.in/moc22 cs123/preview

2. https://discrete.openmathbooks.org/preview/

3.https://mathworld.wolfram.com/topics/DiscreteMathematics.html

4. https://www.csie.ntu.edu.tw/-sylee/courses/dm/resources.htm

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I Year II Semester

ENVIRONMENTAL SCIENCE

Course Objectives:

To make the students to get awareness on environment

To understand the importance of protecting natural resources, ecosystems for future generations and pollution causes due to the day to day activities of human life

To save earth from the inventions by the engineers.

UNIT-1

Multidisciplinary Nature Of Environmental Studies: Definition, Scope and Importance, Need for Public Awareness.

Natural Resources: Renewable and non-renewable resources, Natural resources and associated problems, Forest resources, Use and over, exploitation, deforestation, case studies-Timber extraction Mining, dams and other effects on forest and tribal people, Water resources, Use and over utilization of surface and ground water, Floods, drought, conflicts over water, dams-benefits and problems, Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies: Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies: Energy resources.

UNIT-11

Ecosystems: Concept of an ecosystem. Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids: Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem.

b. Grassl and ecosystem

c. Desert ecosystem

d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Biodiversity And Its Conservation: Introduction Definition: genetic, species and ecosystem diversity- Bio-geographical classification of India, Value of biodiversity, consumptive use,

Productive use, social, ethical, aesthetic and option values, Biodiversity at global, National and local levels, India as a mega-diversity nation, Hot-sports of biodiversity, Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, Endangered and endemic species of India, Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT-III

Environmental Pollution: Definition, Cause, effects and control measures of:

a.Air Pollution.

b. Water pollution

c.Soil pollution

d. Marine pollution.

e.Noise pollution

f. Thermal pollution.

g. Nuclear hazards

Solid Waste Management: Causes, effects and control measures of urban and industrial wastes, Role of an individual in prevention of pollution, Pollution case studies, Disaster management: floods, earthquake, cyclone and landslides.

UNIT-IV

Social Issues and the Environment: From Unsustainable to Sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management, Resettlement and rehabilitation of people, its problems and concems. Case studies: Environmental ethics: Issues and possible solutions, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies: Wastel and reclamation. Consumerism and waste products. Environment Protection Act, Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act, Wild life Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation, Public awareness.

UNIT-V

Human Population And The Environment: Population growth, variation among nations. Population explosion, Family Welfare Programmes. Environment and human health, Human Rights, Value Education, HIV/AIDS, Women and Child Welfare, Role of information Technology in Environment and human health-Case studies. Field Work: Visitto a local area to document environmental assets River forest grassland/hill/ mountain, Visit to a local

polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds-river, hills lopes, etc...

Text books:

1. Text book of Environmental Studies for Undergraduate Courses ErachBharucha for University Grants Commission, Universities Press.

2. Palaniswamy, "Environmental Studies", Pearson education.

1. S. AzeemUnnisa," Environmental Studies" Academic Publishing Company

4. K. Raghavan Nambiar," Text book of Environmental Studies for Undergraduate Courses as per UGC model syllabus", Scitech Publications (India), Pvt. Ltd.

Reference Books:

1. Deeksha Dave and E. Sai Baba Reddy, "Text book of Environmental Science",

Cengage Publications.

2. M. Anji Reddy, "Text book of Environmental Sciences and Technology", BS Publication.

3. JP. Sharma, Comprehensive Environmental studies, Laxmi publications.

4. J.Glynn Henry and Gary W. Heinke, "Environmental Sciences and Engineering". Prentice Hall of India Private limited

5 . G.R.Chatwal, "A Text Book of Environmental Studies "Himalaya Publishing House

6. Gilbert M. Masters and Wendell P.Ela, "Introduction to Environmental Engineering and Science, Prentice Hall of India Private limited.

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I Year II Semester

BUSINESS ORGANIZATION

Course Objectives

The course aims to acquire conceptual knowledge of business, formation various business organizations. To provide the knowledge on deciding plant location, plan layout and business **combinations.**

Unit I:

Business: Concept, Meaning, Features, Stages of development of business and importance of business, Classification of Business Activities. Meaning. Characteristics, Importance and Objectives of Business Organization. Difference between Industry & Commerce and Business & Profession. Modem Business and their Characteristics.

Unit II:

Promotion of Business: Considerations in Establishing New Business. Qualities of a Successful Businessman. Forms of Business Organization Sole Proprietorship, Partnership, Joint Stock Companies & Co-operatives and their Characteristics, relative merits and demerits, Difference between Private and Public Company, Concept of One Person Company.

Unit III :

Plant Location and Layout: Meaning, Importance, Factors affecting Plant Location. Plant Layout Meaning, Objectives, Importance, Types of Layout. Factors affecting Layout. Size of Business Unit Criteria for Measuring the Size and Factors affecting the Size. Optimum Size and factors determining the Optimum Size.

Unit IV:

Business Combination: Meaning, Characteristics, Objectives, Causes, Forms and Kinds of Business Combination. Rationalization: Meaning, Characteristics, Objectives, Principles, Merits and demerits, Difference between Rationalization and Nationalization.

Unit V:

Computer Essentials: Milestones of Computer Evolution Computer, Block diagram, generations of computer. Internet Basics Internet, history, Internet Service Providers, Types of Networks, IP, Domain Name Services, applications. Ethical and Social Implications Network and security concepts Information Assurance Fundamentals, Cryptography

Symmetric and Asymmetric, Malware, Firewalls, Fraud Techniques, privacy and data protection

Reference Books:

1. Gupta, C.B., "Business Organisation", MayurPubliction, (2014).

2. Singh, B.P., Chhabra, T.N., "An Introduction to Business Organisation&

Management", Kitab Mahal, (2014). 3. Sherlekar, S.A. &Sherlekar, V.S, "Modem Business Organization & Management Systems Approach Mumbai", Himalaya Publishing House, (2000).

4. Bhusan Y. K., "Business Organization", Sultan Chand & Sons.

5. Prakash, Jagdish, "Business Organistaton and Management", Kitab Mahal Publishers (Hindi and English)

6. Fundamentals of Computers by V. Raja Raman

7. Cyber Security Essentials by James Graham, Richard Howard, Ryan Olson

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I Year II Semester

DATA STRUCTURES

Course Objectives:

Solve problems using data structures such as linear lists, stacks, queues, hash tables Be familiar with advanced data structures such as binary search trees

UNIT-1:

Introduction to Data Structures: Abstract Data Types (ADTs), The List ADT: Simple Array Implementation of Lists, Simple Linked Lists, Doubly Linked Lists, Circularly Linked Lists.

Searching: Linear and Binary Search Methods.

Sorting: Selection Sort, Insertion Sort, Quick Sort, Merge Sort, Heap sort.

UNIT-II :

The Stack ADT: The Stack Model, Implementation of Stacks, Applications of Stack. The Queue ADT: Queue Model, Array Implementation of Queues, Application of Queues, Stacks and Queue. implementation of stacks and queues using linked list.

UNIT-III:

Hashing: Hash Function, Separate Chaining, Collision Resolution Separate Chaining, Open Addressing: Linear Probing, quadratic probing, Double Hashing, rehashing, Extendible Hashing

UNIT-IV:

Heap: Structure Property, Heap-Order Property, Basic Heap Operations. Applications: The Selection problem, Event Simulation. Tries, Standard Tries, Compressed Tries, Suffix Tries. (Examples only),

UNIT-V:

Trees: Binary Trees traversals, Implementation, Expression Trees. Binary Search Trees-

find, find Min and find Max, insert, delete operations.

Graphs-Basic Concepts, Storage Structures and Traversals, minimum cost spanning trees

Text Books:

1. Data Structures and Algorithm Analysis, 4th Edition, Mark Allen Weiss, Pearson.

2. Data Structures: A Pseudo Code Approach with C. 2nd Edition, Richard F.Gilberg. &Behrouz A. Forouzon, Cengage.

3. C and Data Structures: A Snap Shot Oriented Treatise Using Live Engineering Examples, N.B.Venkateswarulu, E. V.Prasad, S Chand &Co 2009.

References Books:

1. Data Structures, Algorithms and Applications in java, 2/e, SartajSahni, University Press.

2. Data Structures using C, 2/e, Reema Thareja

Web Resources:

1. https://archive.nptel.ac.in/courses/106/102/106102064/

2.https://ocw.mit.edu/courses/6-006-introduction-to-algorithms-spring-2020/video galleries/lecture-videos/

3. https://www.cs.usfca.edu/~galles/visualization/Algorithms.html

4. https://visualgo.net/en

5. https://eleam.daffodilvarsity.edu.bd/course/view.php?id=11771

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I Year II Semester

OOPS THROUGH C++

Course Objectives:

This course is designed to provide a comprehensive study of the C programming language.

- It stresses the strengths of C, which provide students with the means of writing. efficient, maintainable and portable code.
- The nature of C language is emphasized in the wide variety of examples and applications.
- To know about some popular programming languages and how to choose Programming language for solving a problem.

UNIT - I:

Introduction to C++: Difference between C and C++, Evolution of C++, The Object Oriented Technology. Disadvantage of Conventional Programming. Key Concepts of Object Oriented Programming. Advantage of OOP, Object Oriented Language.

UNIT - II:

Classes and Objects &Constructors and Destructor: Classes in C++, Declaring Objects, Access Specifiers and their Scope, Defining Member Function, Overloading Member Function, Nested class, Constructors and Destructors, Introduction, Characteristics of Constructor and Destructor, Application with Constructor, Constructor with Arguments, parameterized Constructor, Destructors, Anonymous Objects.

UNIT-III:

Operator Overloading and Type Conversion & Inheritance: The Keyword Operator, Overloading Unary Operator, Operator Return Type, Overloading Assignment Operator (-), Rules for Overloading Operators, Inheritance, Reusability, Types of Inheritance, Diamond Problem, Virtual Base Classes, Object as a Class Member, Abstract Classes, Advantages of Inheritance, Disadvantages of Inheritance

UNIT- IV:

Pointers & Binding Polymorphisms and Virtual Functions: Pointer, Features of Pointers, Pointer Declaration, Pointer to Class, Pointer Object, The this Pointer, Pointer to Derived Classes and Base Class, Binding Polymorphisms and Virtual Functions, Introduction, Binding in C++, Virtual Functions, Rules for Virtual Function, Virtual Destructor,

UNIT V:

Templates, Exception Handling: Generic Programming with Templates, Need for Templates, Definition of class Templates, Normal Function Templates, Over Loading of Template Function, Bubble Sort Using Function Templates, Difference Between Templates and Macros, Linked Lists with Templates, Exception Handling. Principles of Exception.

Handling, The Keywords try throw and catch, Multiple Catch Statement, Specifying Exceptions.

Text Books:

1. E. Balaguruswamy, Object Oriented Programming with C++, 6/e, McGraw Hill, 2013.

2. A First Book of C++, Gary Bronson, Cengage Leaming..

3. The Complete Reference C++, Herbert Schildt, TMH.

4. Programming in C++, Ashok N Kamthane, Pearson 2nd Edition

Reference Books:

1. Object Oriented Programming with C++ by Reema Thareja, OXFORD University

Press

2. Object Oriented Programming C++, Joyce Farrell, Cengage 3. C++ Programming: from problem analysis to program design, DS Malik, Cengage Learning

Web Resources:

1. https://onlinecourses.nptel.ac.in/noc22 cs103/preview

2. https://ocw.mit.edu/courses/6-088-introduction-to-c-memory-management-and-c- object-oriented-programming-january-iap-2010/pages/lecture-notes/

3. https://see stanford.edu/Course/CS106B

4. https://www.udemy.com/course/object-oriented-c-plus-plus-programming/

5. https://wiingy.com/learn/cpp/cpp-concepts/

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I Year II Semester

DATA STRUCTURES THROUGH C LAB

Course Objectives:

From the course the student will

- Solve problems using data structures such as linear lists, stacks, queues, hash tables
- Be familiar with advanced data structures such as balanced search trees, AVL Trees, and B Trees.

List of experiments:

Experiment 1:

1. Write a C program to perform various operations on single linked list

Experiment 2:

2. Write a C program for the following

a) Reverse a linked list b) Sort the data in a linked list

Experiment 3:

b) Sort the data in a linked list

3. Write a C program for the following

a) Remove duplicates b) Merge two linked lists

Experiment 4:

4. Write a C program to perform various operations on doubly linked list.

Experiment 5:

5. Write a C program to perform various operations on circular linked list.

Experiment 6:

6. Write a C program for performing various operations on stack using linked list.

Experiment 7:

7. Write a C program for performing various operations on queue using linked list.

Experiment 8:

8. Write a C program for the following using stack

a) Infix to postfix conversion.

b) Expression evaluation.

c) Obtain the binary number for a given decimal number.

Experiment 9:

9. Write a C program to implement various operations on Binary Search Tree Using Recursive and Non-Recursive methods,

Experiment 10:

10. Write a C program to implement Selection Sort & Insertion Sort for given elements.

Experiment 11:

11. Write a C program to implement Merge & Heap Sort for given elements.

Experiment 12:

12. Write a C program to implement Quick Sort for given elements.

Experiment 13:

13. Write a C program to implement various operations on AVL trees.

Experiment 14:

14. Write a C program to perform the following operations: a) Insertion into a B-tree b) Searching in a B-tree

Experiment 15:

15. Write a C program to implementation of recursive and non-recursive functions to Binary tree Traversals

Web Resources:

1. https://ds1-mith. vlabs.ac.in/

2. https://profile.iita.ac.in/bibhas,ghoshal/teaching ds _lab.html

3. https://moodle.sit.ac.in/blog/data-structures-laboratory/

4. https://dsalab.netlify.app/

5. https://www.vtuloop.com/data-structure-lab-programs-all/

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I Year II Semester

OOPS THROUGH C++ LAB

Course Objectives:

- To strengthen their problem solving ability by applying the characteristics of an object-oriented approach.
- To introduce object oriented concepts in C++ and Java

Exercise 1: (Basics)

Write a Simple Program on printing "Hello World" and "Hello Name" where name is the input from the user

a) Convert any two programs that are written in C into C++

b) Write a description of using g++ (150 Words)

Exercise 2: (Expressions Control Flow)

a) Write a Program that computes the simple interest and compound interest payable on principal amount (in Rs.) of loan borrowed by the customer from a bank for a given period of time (in years) at specific rate of interest. Further determine whether the bank will benefit by charging simple interest or compound interest.

b) Write a Program to calculate the fare for the passenger starveling in a bus. When a Passenger enters the bus, the conductor asks "What distance will you travel?" On knowing distance from passenger (as an approximate integer), the conductor mentions the fare to the passenger according to following criteria.

Exercise 3: (Variables, Scope, Allocation)

a) Write a program to implement call by value and call by reference using reference variable.

b) Write a program to illustrate scope resolution, new and delete Operators. (Dynamic Memory Allocation)

e) Write a program to illustrate Storage classes

d) Write a program to illustrate Enumerations

Exercise 4: (Functions)

Write a program illustrating Inline Functions

a) Write a program illustrates function overloading. Write 2 overloading functions for power.

b) Write a program illustrates the use of default arguments for simple interest function.

Exercise 5: (Functions-Exercise Continued)

a) Write a program to illustrate function overloading. Write 2 overloading functions for adding two numbers

b) Write a program illustrate function template for power of a number.

e) Write a program to illustrate function template for swapping of two numbers

Exercise 6: (Classes Objects)

Create a Distance class with:

- feet and inches as data members
- member function to input distance
- member function to output distance
- member function to add two distance objects

a) Write a main function to create objects of DISTANCE class. Input two distances and output the sum.

b) Write a C++ Program to illustrate the use of Constructors and Destructors (use the above program.)

c) Write a program for illustrating function overloading in adding the distance between. objects (use the above problem)

d) Write a C++ program demonstrating a Bank Account with necessary methods and variables

Exercise 7: (Access)

Write a program for illustrating Access Specifiers public, private, protected

a) Write a program implementing Friend Function

b) Write a program to illustrate this pointer

c) Write a Program to illustrate pointer to a class

Exercise 8: (Operator Overloading)

a) Write a program to Overload Unary, and Binary Operators as Member Function, and Non

member Function.

i. Unary operator as member function

i. Binary operator as non-member function.

b) Write a C++ program to implement the overloading assignment operator

Exercise 9: (Inheritance)

a) Write C++ Programs and incorporating various forms of Inheritance

i) Single Inheritance

ii) Hierarchical Inheritance

iii) Multiple Inheritances

Exercise 10: (Inheritance -Continued)

a) Write C++ Programs and incorporating various forms of Inheritance i)

Multi-level inheritance

ii) Hybrid inheritance.

b) Write a program to show

Virtual Base Class

Exercise 11: (Inheritance-Continued)

a) Write a Program in C++ to illustrate the order of execution of constructors and destructors. in inheritance

b) Write a Program to show how constructors are invoked in derived class

Exercise 12: (Polymorphism)

a) Write a program to illustrate runtime polymorphism

b) Write a program to illustrate this pointer

c) Write a program illustrates pure virtual function and calculate the area of different shapes by using abstract class.

Exercise 13: (Templates)

a) Write a C++ Program to illustrate template class

b) Write a Program to illustrate class templates with multiple parameters

c) Write a Program to illustrate member function templates

Exercise 14: (Exception Handling)

a) Write a Program for Exception Handling Divide by zero

b) Write a Program to rethrow an Exception

Exercise 15: (STL)

a) Write a Program to implement List and List Operations

b) Write a Program to implement Vector and Vector Operations.

Web Resources:

1. https://eecs.wsu.edu/-nroy/courses/cpts122/labs/
2. https://www.coursera.org/leam/c-plus-plus-
3. https://www.educative.io/courses/leam-object-oriented-programming-in-cpp
4. https://www.udemy.com/course/fundamentals-of-object-oriented-programing- cplusplus/

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I Year II Semester

INDIAN CONSTITUTION

Course Objectives:

Students will be able to:

Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.

To address the growth of Indian opinion regarding modem Indian intellectuals" constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism.

UNIT-1:

History of Making of the Indian Constitution: History, Drafting Committee, (Composition & Working), Philosophy of the Indian Constitution: Preamble, Salient, Features,

UNIT-11:

Contours of Constitutional Rights & Duties: Fundamental Rights, Right to Equality, Right to Freedom, Right against Exploitation, Right to Freedom of Religion, Cultural and Educational Rights, Right to Constitutional Remedies, Directive Principles of State Policy, Fundamental Duties

UNIT-III:

Election Commission: Election Commission: Role and Functioning, Chief Election Commissioner and Election Commissioners, State Election Commission: Role and Functioning, Institute and Bodies for the welfare of SC/ST/OBC and women.

UNIT-IV:

Organs of Governance: Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive: President, Governor, Council of Ministers, Judiciary, Appointment and Transfer of Judges, Qualifications, Powers and Functions.

UNIT-V:

Local Administration: District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative CEO of Municipal Corporation. Panchayati raj: Introduction, PRI: ZilaPanchayat. Elected officials and their roles, CEO Zila

Panchayat: Position and role. Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy.

Text Books:

1. The Constitution of India, 1950 (Bare Act), Government Publication 2. Dr. B. R. Ambedkar framing of Indian Constitution, 1" Edition, Dr. S. N. Busi, 2015

Reference Books:

1. Indian Constitution Law, 7 Edition. M. P. Jain, Lexis Nexis, 2014.

2. Introduction to the Constitution of India, Lexis Nexis, D.D. Basu, 2015,

SREE VAHINIINSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)
TIRUVURU – 521235, ANDHRA PRADESH, INDIA

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I Year II Semester

COMPUTER ORGANISATION

Course Objectives:

The purpose of the course is to introduce principles of computer organization and the basic architectural concepts. It provides an in depth understanding of basic organization, design, programming of a simple digital computer, computer arithmetic, instruction set design, micro programmed control unit, pipelining and vector processing, memory organization and I/O systems

UNIT-I:

Basic Structure Of Computers: Computer Types, Functional unit, Basic Operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers. Data Representation. Fixed Point Representation. Floating - Point Representation.

UNIT-II:

Register Transfer Language And Micro-operations: Register Transfer language. Register Transfer Bus and memory transfers, Arithmetic Micro-operations, Logic micro operations, shift micro operations, Arithmetic logic shift unit. Instruction codes. Computer Registers, Computer instructions, Instruction cycle.

UNIT III:

Micro Programmed Control: Control memory, Address sequencing, micro program

example, design of control unit. Central Processing Unit: General Register Organization, Instruction Formats, Addressing modes, Data Transfer and Manipulation, Program Control.

UNIT IV:

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary memory, Associate Memory, Cache Memory, Cache memories performance considerations, Virtual memories Introduction to Shift registers and RAID

UNIT V:

Input-Output Organization Peripheral Devices, Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupts, DMA, Input Output Processor, Serial Communication.

Text Books:

1. Digital Logic and Computer Design, Moriss Mano, 11th Edition, Pearson Education.

2. Computer Organiza tion, 5thed., Hamacher, Vranesicand Zaky, TMH,2002

3. Computer System Architecture, 3/e, Moris Mano, Pearson/PHI.

Reference Books:

BCA Course Structure and Syllabus (Applicable for batches admitted from 2024-2025)

1. Computer System Organization & Architecture, John D. Carpinelli, Pearson, 2008

2. Computer System Organization, NareshJotwani, TMH, 2009

3. Computer Organization & Architecture: Designing for Performance, 7thed., William Stallings, PHI, 2006

4. Structured Computer Organization - Andrew S. Tanenbaum, 4th Edition, PHI/Pearson.

Web Resources:

1. https://nptelvideos.com/course.php?id=396

2. https://onlinecourses.nptel.ac.in/noc20 cs64/preview

3. https://www.learncomputerscienceonline.com/computer-organization-and- architecture/

4. http://williamstallings.com/COA/COA8e-student/index.html