

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR, ANANTHAPURAMU**  
**Course Structure w.e.f. 2017-18 onwards**  
**Master of Computer Applications**

**MCA I Year -I-Semester**

S.No.	Course code	Subject	L	T	P	C
1	17FHS101	Technical Communication Skills	4	-	-	4
2	17FBS101	Probability and Statistics	4	-	-	4
3	17FHS102	Accounting and Financial Management	4	-	-	4
4	17F00101	Mathematical Foundations for Computer Science	4	-	-	4
5	17F00102	Introduction to Problem Solving and Programming	4	-	-	4
6	17FHS103	English Language Communication Skills Lab	-	-	4	2
7	17F00103	Computer Programming Lab	-	-	4	2
8	17F00104	IT Workshop	-	-	4	2
Total			20	-	12	26

**MCA I Year-II-Semester**

S.No.	Course code	Subject	L	T	P	C
1	17FHS201	Organization Structure and Human Resource Management	4	-	-	4
2	17F00201	Data Structures	4	-	-	4
3	17F00202	Computer Organization	4	-	-	4
4	17F00203	Operations Research	4	-	-	4
5	17F00204	Java Programming	4	-	-	4
6	17F00205	Data Structures Lab	-	-	4	2
7	17F00206	Java Programming Lab	-	-	4	2
8	17FHS202	Advanced Communication Skills Lab	-	-	4	2
Total			20	-	12	26

**MCA II Year-I-Semester**

S.No.	Course code	Subject	L	T	P	C
1	17F00301	Database Management Systems	4	-	-	4
2	17F00302	Computer Networks	4	-	-	4
3	17F00303	Web Technologies	4	-	-	4
4	17F00304	Software Engineering	4	-	-	4
5	17F00305	Operating Systems	4	-	-	4
6	17F00306	Web Technologies Lab	-	-	4	2
7	17F00307	Operating Systems Lab	-	-	4	2
8	17F00308	Database Management Systems Lab	-	-	4	2
Total			20	-	12	26

**MCA II Year-II-Semester**

S.No.	Course code	Subject	L	T	P	C
1	17F00401	Object Oriented Analysis and Design	4	-	-	4
2	17F00402	Design and Analysis of Algorithms	4	-	-	4
3	17F00403	Linux Programming	4	-	-	4
4	17F00404 17F00405 17F00406	Elective-I a. Computer Graphics and Multimedia b. Internet of Things c. Artificial Intelligence	4	-	-	4
5	17F00407 17F00408 17F00409	Elective-II a. Big data Analytics b. Scripting Languages c. Distributed Systems	4	-	-	4
6	17F00410	Object Oriented Analysis and Design Lab	-	-	4	2
7	17F00411	Design and Analysis of Algorithms Lab	-	-	4	2
8	17F00412	Linux Programming Lab	-	-	4	2
Total			20	-	12	26

**MCA III Year-I-Semester**

S.No.	Course code	Subject	L	T	P	C
1	17F00501	Cloud Computing	4	-	-	4
2	17F00502	Software Testing	4	-	-	4
3	17F00503	Fundamentals of Data Science	4	-	-	4
4	17F00504 17F00505 17F00506	Elective-III a. Design Patterns b. Human Computer Interaction c. Python Programming	4	-	-	4
5	17F00507 17F00508 17F00509	Elective-IV a. Software Project management b. Mobile Application Development c. Web services	4	-	-	4
6	17F00510	Map Reduce Programming Lab	-	-	4	2
7	17F00511	Software Testing Lab	-	-	4	2
8	17F00512	R & Analytics Lab	-	-	4	2
Total			20	-	12	26

**MCA III Year-II-Semester**

S.No	Course code	Subject	C
1	17F00601	Seminar	2
2	17F00602	Dissertation/Thesis (Very Good/Good/Satisfactory/Not-Satisfactory)	8
Total			10

(17FHS101) TECHNICAL COMMUNICATION SKILLS

**COURSE OBJECTIVES**

- 1 To develop awareness in students of the relevance and importance of technical communication and presentation skills.
- 2 To prepare the students for placements
- 3 To sensitize the students to the appropriate use of non-verbal communication
- 4 To train students to use language appropriately for presentations and interviews
- 5 To enhance the documentation skills of the students with emphasis on formal and informal writing

**COURSE OUTCOMES**

- CO1 Become effective technical communicators
- CO2 Be job-ready and able to face interviews confidently
- CO3 Sensitive use of non-verbal language suitable to different situations in professional life
- CO4 Learn and use key words, phrases and sentence structures making a mark in interviews and presentation skills
- CO5 Effective writing skills with the ability to use different styles for different situations

UNIT 1: Basics of Technical Communication – Introduction – Objectives & Characteristics of Technical Communication – Importance and need for Technical communication - LSRW Skills – Barriers to effective communication

UNIT II

Informal and Formal Conversation - Verbal and Non-verbal communication –Kinesics, Proxemics, Chronemics, Haptics, Paralanguage

UNIT III

Written communication – Differences between spoken and written communication – Features of effective writing –Advantages and disadvantages of spoken and written communication- Art of condensation- summarizing and paraphrasing

UNIT IV

Presentation Skills – Nature and importance of oral presentation – Defining the purpose – Analyzing the audience - Planning and preparing the presentation, organizing and rehearsing the presentation – Individual and group presentations - Handling stage fright

UNIT V

Interview Skills – The Interview process –Characteristics of the job interview – Pre-interview preparation techniques – Projecting the positive image – Answering Strategies

**Text Books:**

1. Effective Technical Communication, Ashrif Rizvi, TataMcGrahill, 2011
2. Technical Communication by Meenakshi Raman & Sangeeta Sharma, 3<sup>rd</sup> Edition, O U Press 2015

**References:**

1. Communication Skills by Pushpalatha & Sanjay Kumar, Oxford University Press
2. Books on TOEFL/GRE/GMAT/CAT/ IELTS by Barron's/DELTA/Cambridge University Press. 2012.
3. Soft Skills for Everyone, Butterfield Jeff, Cengage Publications, 2011.
4. Management Shapers Series by Universities Press (India) Pvt Ltd., Himayatnagar, Hyderabad 2008.
5. Successful Presentations by John Hughes & Andrew Mallett, Oxford.
6. Winning at Interviews by Edgar Thorpe and Showick Thorpe, Pearson

**(17FBS101) PROBABILITY AND STATISTICS**

**Objectives:**

- To help the students in getting a thorough understanding of the fundamentals of probability and usage of statistical techniques like testing of hypothesis, ANOVA, Statistical Quality Control, curve fitting and Queuing theory.

**UNIT-I**

Basic Concepts of Probability - Conditional probability – Baye's theorem. Random variables – Expectation Discrete and continuous – Distribution – Distribution functions. Binomial and Poisson distributions Normal distribution – Related properties.

**UNIT-II**

Test of hypothesis: Populations and samples- confidence interval of mean from normal distribution – Statistical hypothesis – Null and Alternative Hypothesis –Level of Significance –Test of significance –Test based on the normal distribution –Z-test for means and proportions: small samples –t-test for one sample and two sample problem and paired t-test, F-test and chi-square test (testing of goodness of fit and independence).

**UNIT-III**

Analysis of variance one way classification and two-way classification. Latin square Design and RBD.

**UNIT-IV**

Statistical Quality control : Concept of quality of a manufactured Defectives- Causes of variations- Random and assignable – the principle of Schwartz control charts for attribute and Variable quality characteristics- Constructions and operation of X-bar chart, R-chart , P-chart and C-chart.

**UNIT-V**

Curve fitting: The method of least squares- Inferences based on the least squares estimations-curvilinear regression-Multiple regression-correlation for univariate and bivariate distributions.

**TEXT BOOKS:**

1. Probability & Statistics for engineers by Dr.J.Ravichandran WILEY-INDIA publishers.
2. Probability & statistics by E.Rukmagadachari &E.keshava Reddy, Pearson publisher.

**REFERENCES:**

1. Probability & Statistics by T.K.V.Iyengar, B.Krishna Gandhi and S.Ranganatham and M.V.S.S.N.Prasad, S.Chand publications.
2. Mathematical Statistics by B.Rama Bhupal Reddy Research India Publications (DELHI), 2016).
2. Stastical methods by S.P.Gupta, S.Chand Publications.
3. Probability & Statistics for Science and Engineering by G.Shankarrao, Universities Press.
4. Probability & Statistics for Engineering and Sciences by Jay L.Devore, Cengage.
5. Probability & Statistics by R.A.Johnson and Gupta C.B.

**Outcomes:**

- The student will be able to analyze the problems of engineering & industry using the techniques of testing of hypothesis, ANOVA, Statistical Quality Control, curve fitting and Queuing theory and draw appropriate inferences.

**(17FHS102) ACCOUNTING AND FINANCIAL MANAGEMENT**

**Objective:** The objective of the course is to familiarize the student with the fundamentals of Accounting principles and Financial Management for making sound financial decisions.

**UNIT- I: Introduction to Accounting:** Definition of Accounting- Accounting concepts –Principles- Double entry system of accounting- classification of accounts- Books of accounts – Journal entries- Ledger books – preparation of financial statements and accounts-Trial Balance- Trading account-Profit and Loss account - Balance sheet(Simple problems with adjustments) .

**UNIT- II: Cost Accounting and Marginal Costing:** Nature- importance- Scope- difference between financial accounting and cost accounting- principles-Absorption costing- Marginal Costing - Concept of Break Even Analysis - Margin of Safety and P/V ratio- Break Even Point-Determination of BEP- Cost-Volume-Profit Analysis – managerial applications of BEP and application of marginal costing techniques (Simple problems).

**UNIT- III: Financial Analysis and Interpretations:** Funds flow and cash flow statements meaning-importance-statement of changes in working capital - sources and application of funds - Funds Flow and Cash flow analysis-Financial analysis through Ratios–liquidity ratios- solvency ratios – Profitability ratio, Activity ratio (Simple problems).

**UNIT- IV: Financial Management:** Definition-objectives- finance functions-importance-Profit and wealth maximization- Sources of capital- concept of Leverage and types of Leverage- Over Capitalization and Under Capitalization- Time Value of money -Present value of Money and Future Value of Money.

**UNIT- V: Capital Budgeting and Budgeting Techniques:** Definition- Features- Significance-methods of evaluation of capital budgeting proposals - Payback Period-Accounting Rate of Return (ARR)- Net Present Value Method (NPV) and Internal Rate of Return (IRR)- (Simple problems).

**Learning Outcome:** After completion of this course, the student will be able to understand the basic accounting principles, gets exposure to the fundamental concepts, techniques and tools of Financial Management, also enables to prepare and analyze financial statements of business enterprises for taking sound financial decisions.

**TEXT BOOKS:**

1. M.N.Arora, Accounting for Management, , HPH, 2012.
2. T.S.Reddy and Y.Hari Prasad Reddy, Accounting and Financial Management, Margham Publications.

**REFERENCES:**

1. Khan M.Y, Jain P.K, Management Accounting, 5<sup>th</sup> Edition , Tata McGraw Hill, 2012.
2. S.N.Maheshwari, Financial Accounting, 4<sup>th</sup> Edition,Vikas Publications, 2012.
3. Khan M.Y, Jain P.K, Financial Statement Analysis, PHI, 2009.
4. I.M.Pandey, Financial Management,10<sup>th</sup> Edition,Vikas Publications, 2011.
5. Financial Management, 7<sup>th</sup> Edition, TMH, 2011.

**(17F00101) MATHEMATICAL FOUNDATIONS FOR COMPUTER SCIENCE**

**Course Objective**

- Apply logical reasoning to solve a variety of problems.
- Understand and apply methods of discrete mathematics such as proofs, counting principles, number theory, logic and set theory to mathematical problems in a creative way.
- To apply the abstract concepts of graph theory in modelling and solving non-trivial problems in different fields of study.

**Course Outcomes**

- Able to apply mathematical concepts and logical reasoning to solve problems in different fields of Computer science and information technology.
- Able to apply the concepts in courses like Computer Organization, DBMS, Analysis of Algorithms, Theoretical Computer Science, Cryptography, Artificial Intelligence

**Unit – I**

**Sets and Propositions:** Introduction, Combination of Sets, Finite and Infinite Sets, Uncountably Infinite Sets, Mathematical Induction, Principle of Inclusion and Exclusion, Multisets, Propositions, Logical Connectives, Conditional and Biconditionals, Well-Formed Formulas, Tautologies, Logical Equivalences.

**Relations and Functions:** Introduction, Properties of Binary Relations, Closure of Relations.

**Unit – II**

**Groups:** Introduction, Groups, Subgroups, Generators and Evaluations of Powers, Cosets and Lagranges’s Theorem, Permutations Groups and Burnside’s Theorem, Codes and Group Codes, Isomorphisms and Automorphisms, Homomorphisms and Normal Subgroups.

**Unit – III**

**Permutations, Combinations, and Discrete Probability:** Introduction, the Rules of Sum and Product, Permutations, Combinations, Generation of Permutations and Combinations, Discrete Probability, Conditional Probability.

**Recurrence Relations and Recursive Algorithms:** Introduction, Recurrence Relations, Linear Recurrence Relations with Constant Coefficients, Homogeneous Solutions, Particular Solutions, Total Solutions.

**Unit – IV**

**Graphs:** Introduction, Basic Terminology, Multigraphs and Weighted Graphs, Digraphs and Relations, Representation of Graphs, Operations on Graphs, Paths and Circuits, Graph Traversals, Shortest Paths in Weighted Graphs, Eulerian Paths and Circuits, Hamiltonian Paths and Circuits.

**Unit – V**

**Trees:** Trees, Rooted Trees, Path Lengths in Rooted Trees, Prefix Codes, Binary Search Trees, Spanning Trees and Cut sets, Minimum Spanning Trees, Kruskal’s Algorithm, Prim’s Algorithm.

**Discrete Numeric Functions:** Introduction, Manipulation of Numeric Functions, Asymptotic Behavior of Numeric Functions.

**Text Books:**

1. C L Liu and D Mohapatra “Elements of Discrete Mathematics”, Tata Mcgraw Hill, 2009.

**Reference Books:**

1. Discrete and Combinatorial Mathematics, Fifth Edition, R. P. Grimaldi, B.V. Ramana, Pearson
2. Discrete Mathematics Theory and Applications, D.S Malik and M.K. Sen, Cengage Learning

3. J .L.Mott, A.Kandel, T.P .Baker, Discrete Mathematics for Computer Scientists and Mathematicians, second edition 1986, Prentice Hall of India
4. C.L.Liu, Elements of Discrete Mathematics, Second Edition 1985, McGraw-Hill Book Company. Reprinted 2000
5. Discrete Mathematics, Norman L. Biggs, Second Edition, OXFORD Indian Edition.
6. K.H.Rosen, Discrete Mathematics and applications, 5<sup>th</sup> Edition 2003, TataMcGraw Hillpublishing Company
7. Graph Theory with Applications to Engineering & Computer Science: Narsingh Deo, PHI (2004)  
“Discrete Mathematical Structures” Jayant Ganguly, Sanguine.



**(17F00102) INTRODUCTION TO PROBLEM SOLVING AND PROGRAMMING**

**Course Objectives:**

- To understand the various steps in Program development.
- To understand the basic concepts in C Programming Language.
- To learn how to write modular and readable C Programs
- To understand the basic concepts such as Abstract Data Types, Linear and Non Linear Data structures.
- To understand the notations used to analyze the Performance of algorithms.
- To understand and analyze various searching and sorting algorithms.

**Course Outcomes:**

- Able to design the flowchart and algorithm for real world problems
- Able to learn and understand new programming languages
- Able to construct modular and readable programs
- Able to write C programs for real world problems using simple and compound data types
- Adapt programming experience and language knowledge to other programming language contexts
- Employee good programming style, standards and practices during program development

**UNIT I**

**INTRODUCTION OF COMPUTER PROBLEM-SOLVING**

Introduction – The Problem-solving Aspect – Top-down Design – Implementation of Algorithms - Program Verification – The Efficiency of Algorithms – The Analysis of Algorithms.

FUNDAMENTAL ALGORITHMS – Introduction – Exchanging the Values of Two Variables – Counting – Summation of a Set of Numbers – Factorial Computation – Sine Functional Computation – Generation of the Fibonacci Sequence – Reversing the Digits of an Integer – Base Conversion – Character to Number Conversion.

**UNIT II**

**FACTORING METHODS**

Finding the Square Root of a Number – The Smallest Divisor of an Integer – The Greatest Common Divisor of Two Integers – Generating Prime Numbers – Computing the Prime Factors of an Integer – Generation of Pseudo-random Numbers – Raising a Number to a Large Power – Computing the nth Fibonacci Number.

**UNIT III**

**OVERVIEW OF C LANGUAGE**

Features – Components – Structure – Process of Executing a ‘ C ’ Program - Data Types – Variables – Constants – Operators - Type Modifiers – Expressions – Type Definitions using typedef – Control Statements – Conditional Statements – Loops – Infinite Loops – Nested Loops – Break Statement – Continue Statement – exit() Function – goto Statement – Introduction to Arrays – One-dimensional Array – Strings – Two-dimensional Array

**UNIT IV**

**FUNCTIONS** - Introduction to Functions – Function Declaration and Prototypes – Definition – Storage Classes – Scope and Lifetime of Declaration – Passing Parameters of Functions – Command Line Arguments – Recursion in Function.

**STRUCTURES** – Definition – Bit Fields – Giving Values to Members – Structure Initialization – Comparison of Structures Variables – Arrays of Structures – Array within Structures – Structures within Structures – Passing Structures to Functions – Structure Pointers.

UNIONS – Definition and Declaration – Accessing a Union Member – Union of Structures – Initialization of a Union Variable – Use of Union – Use of User-defined Type Declarations.

#### **UNIT V**

POINTERS – Introduction to Pointers – Pointer Notation – Declaration and Initialization – Accessing a Variable through a Pointer – Difference between Array and Pointer – Pointer Expressions – Pointers and One-dimensional Arrays – malloc Library Function – calloc Library Function – Pointers and Multi-dimensional Arrays – Arrays of Pointers – Pointer to Pointers – Pointers and Functions – Functions with a Variable Number of Arguments.

FILE HANDLING IN 'C' – File – Defining and Opening a File – Closing a File – Input/Output Operations on Files – Functions for Random Access to Files – Example Programs.

#### **TEXT BOOKS:**

1. R. G. Dromey, How to Solve it by Computer, Pearson Education, 2007.
2. ISRD Group, Programming and Problem Solving Using C, Tata McGraw-Hill.

#### **REFERENCE BOOKS:**

1. Herbert Schildt, Osborne, C- The Complete Reference, Mcgraw Hill, Inc.
2. Brian W. Kerningham and Dennis Ritchie, C Programming Language (ANSI C), Pearson Edition.
3. B.S. Gottfried, Programming with C, Schaum Series, TMH.
4. Alfred V. Aho, Foundations of Computer Science(C Edition).

**COURSE OBJECTIVES**

- 1 To facilitate computer-aided multi-media instruction enabling individualized and independent language learning
- 2 To sensitise the students to the nuances of English speech sounds, word accent, intonation and rhythm
- 3 To provide opportunities for practice in using English in day to day situations
- 4 To improve the fluency in spoken English and neutralize mother tongue influence
- 5 To train students to use language appropriately for debate, group discussion and public speaking

**COURSE OUTCOMES**

- CO1 Better Understanding of nuances of language through audio- visual experience and be independent learners
- CO2 The significance of paralinguistic features will be understood by the students and they will try to be intelligible.
- CO3 Become good at Inter-personal skills
- CO4 Achieve neutral accent and be free from mother tongue influence
- CO5 Being an active participant in debates and group discussion, showing ability to express agreement, argument to summarize ideas to elicit the views of others and present own ideas;

**UNIT- I**

Phonetics – Introduction to Sounds of Speech – Vowels – Consonants – Phonetic Transcription & Orthographic Transcription

**UNIT – II**

Syllabification – Word Stress – Rules of word stress – Intonation – Falling tone and Rising tone

**UNIT – III**

Situational Dialogues – Role-play – Expressions in various situations – Self Introduction – Introducing others – Greetings – Apologies – Requests – Giving directions -Social and Professional etiquettes – Telephone Etiquettes

**UNIT – IV**

JAM – Describing Pictures, Photographs, Products, and Process – Talking about Wishes-Information Transfer.

**UNIT – V**

Debates - Group Discussions-1

### **MINIMUM REQUIREMENT FOR ELCS LAB:**

The English Language Lab shall have two parts:

1. Computer Assisted Language Learning (CALL) Lab:  
The Computer aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English language software for self- study by learners.
2. The Communication Skills Lab with movable chairs and audio-visual aids with a P.A. system, Projector, a digital stereo-audio & video system and camcorder etc.

System Requirement (Hardware component):

Computer network with LAN with minimum 60 multimedia systems with the following specifications:

- i) P – IV Processor
  - a) Speed – 2.8 GHZ
  - b) RAM – 512 MB Minimum
  - c) Hard Disk – 80 GB
- ii) Headphones of High quality

### **SUGGESTED SOFTWARE:**

1. Walden Infotech English Language Communication Skills.
2. Clarity Pronunciation Power – Part I (Sky Pronunciation)
3. Clarity Pronunciation Power – part II
4. LES by British council
5. TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
6. *DELTA's key to the Next Generation TOEFL Test: Advanced Skills Practice.*
7. Lingua TOEFL CBT Insider, by Dreamtech
8. English Pronunciation in Use (Elementary, Intermediate, Advanced) CUP
9. Cambridge Advanced Learners' English Dictionary with CD.

### **REFERENCE BOOKS:**

1. A Textbook of English Phonetics for Indian Students 2<sup>nd</sup> Ed T. Balasubramanian. (Macmillian), 2012.
2. A Course in Phonetics and Spoken English, [Dhamija Sethi](#), Prentice-Hall of India Pvt.Ltd
3. Speaking English Effectively, 2<sup>nd</sup> Edition Krishna Mohan & NP Singh, 2011. (Mcmillan).
4. A Hand book for English Laboratories, E.Suresh kumar, P.Sreehari, Foundation Books,2011
5. English Pronunciation in Use. Intermediate & Advanced, Hancock, M. 2009. CUP
6. Basics of Communication in English, Soundararaj, Francis. 2012.. *New Delhi: Macmillan*
7. Spoken English (CIEFL) in 3 volumes with 6 cassettes, OUP.
8. English Pronouncing Dictionary, Daniel Jones Current Edition with CD.Cambridge, 17<sup>th</sup> edition, 2011.

**(17F00103) COMPUTER PROGRAMMING LAB**

**Course Objective**

- To work with the compound data types
- To explore dynamic memory allocation concepts
- Able to design the flowchart and algorithm for real world problems
- Able to write C programs for real world problems using simple and compound data types
- Employee good programming style, standards and practices during program development

**Course Outcomes**

- Able to have fundamental concept.
- Able to write, compile and debug programs in C language.
- Able to formulate problems and implement algorithms in C.
- Able to effectively choose programming components that efficiently solve computing problems in real-world.
- Able to use different data types in a computer program.
- Able to design programs involving decision structures, loops and functions.

- Week-1**
- 1) Write a C program to make the following exchange between the variables a-> b -> c->d -> a
  - 2) Write a C program to carry out the arithmetic operations addition, subtraction, multiplication, and division between two variables
  - 3) Write a C program for printing prime numbers between 1 and n.

- Week-2**
- 1) Write a C program to construct a multiplication table for a given number.
  - 2) Write a program to reverse the digit of a given integer.
  - 3) Write a C program to find the sum of individual digits of a positive integer.
  - 4) Write a C program to calculate the factorial of a given number

- Week-3**
- 1) Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
  - 2) Write a program to calculate tax, given the following conditions:
    - a) If income is less than 1,50,000 then no tax.
    - b) If taxable income is in the range 1,50,001 – 300,000 then charge 10% tax
    - c) If taxable income is in the range 3,00,001 – 500,000 then charge 20% tax
    - d) If taxable income is above 5,00,001 then charge 30% tax

- Week-4**
- 1) Write a program to print the calendar for a month given the first Week- day of the month.

Input the first day of the month (Sun=0,Mon=1,Tue=2,Wed=3,.....) :: 3

Total number of days in the month : 31

Expected output

<i>Sun</i>	<i>Mon</i>	<i>Tue</i>	<i>Wed</i>	<i>Thu</i>	<i>Fri</i>	<i>Sat</i>
-	-	-	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
25	26	27	28	29	30	31

- 2) Write a C program to find the roots of a quadratic equation

- Week-5**
- 1) Write a program to print the Pascal triangle for a given number

- 2) Write a C program to find the GCD (greatest common divisor) of two given integers
  - 3) Write a C program to construct a pyramid of numbers.
  - 4) Write C code to define a function `cash_dispense`, which takes an amount as its input, and returns the number of 1000, 500, 100, 50, 20, 10, 5, 2, 1 rupee denomination that make up the given amount
- Week-6**
- 1) Write C code to reverse the contents of the array. For example, [1,2,3,4,5] should become [5,4,3,2,1]
  - 2) Write a C program that uses functions to perform the following:
    - i) Addition of Two Matrices
    - ii) Multiplication of Two Matrices
  - 3) Write a program that will search and find out the position where the given key element exist in a user chosen array and print it as output.
- Week-7**
- 1) Write C code to compute the frequency table of survey responses given by 20 users. The survey responses range from 1 to 5 and are stored in an array. For example, 10 responses are stored in the array [1,1,5,2,3,3,5,5,2,2]. The frequency table will be as shown below:
    - a. 1 = 2
    - b. 2 = 3
    - c. 3 = 2
    - d. 4 = 0
    - e. 5 = 3
  - 2) Write a program to define a function to sort an array of integers in ascending order by using exchange sort.
- Week-8**
- 1) Write a C program to check whether a given string is a palindrome or not, without using any built-in functions.
  - 2) Write a C program to determine if the given string is a palindrome or not by using string functions.
  - 3) Write a function that accepts a string and delete the first character.
  - 4) Write a function that accepts a string and delete all the leading spaces.
- Week-9** Write a program to accept a string from user and display number of vowels, consonants, digits and special characters present in each of the words of the given string.
- Week-10**
- 1) Write a C program to define a union and structure both having exactly the same numbers using the `sizeof` operators print the `sizeof` structure variables as well as union variable
  - 2) Declare a structure *time* that has three fields *hr*, *min*, *secs*. Create two variables, *start\_time* and *end\_time*. Input there values from the user. Then while *start\_time* is not equal to *end\_time* display GOOD DAY on screen.
- Week-11**
- 1) Write a program to read in an array of names and to sort them in alphabetical order. Use sort function that receives pointers to the functions `strcmp`, and `swap`, sort in turn should call these functions via the pointers.
  - 2) Write a program to read and display values of an integer array. Allocate space dynamically for the array using the `malloc()`.
  - 3) Write a program to calculate area of a triangle using function that has the input parameters as pointers as sides of the triangle.
- Week-12**
- 1) Two text files are given with the names `text1` and `text2`. These files have several lines of text. Write a program to merge (first line of `text1` followed by first line of `text2` and so on until both the files reach the end of the file) the lines of `text1` and `text2` and write the merged text to a new file `text3`.
  - 2) Write a program to split a given text file into `n` parts. Name each part as the name of the original file followed by `.part<n>` where `n` is the sequence number of the part file.

Reference Books:

1. Computer Science, A Structured Programming Approach Using C by Behrouz A. Forouzan& Richard F. Gilberg, Third Edition, Cengage Learning
2. C Programming A Problem-Solving Approach, Behrouz A. Forouzan& E.V. Prasad, F. Gilberg, Third Edition, Cengage Learning
3. Programming with C RemaTheraja, Oxford
4. "C Test Your Skills", Kamthane, Pearson Education
5. Programming in C: A Practical Approach, Ajay Mittal, Pearson
6. Problem solving with C, M.T.Somasekhara, PHI
7. C Programming with problem solving, J.A. Jones & K. Harrow,Dreamtech Press
8. Programming withc, Byron S Gottfried, Jitender Kumar Chhabra, TMH, 2011

(17F00104) IT WORKSHOP

**Course Objectives:**

- To provide Technical training to the students on Productivity tools like Word processors, Spreadsheets, Presentations
- To make the students know about the internal parts of a computer, assembling a computer from the parts, preparing a computer for use by installing the operating system
- To learn about Networking of computers and use Internet facility for Browsing and Searching

**Preparing your Computer**

**Task 1:** Identify the internal parts of a computer of a computer, and its peripherals. Represent the same in the form of diagrams including Block diagram.

**Task 2:** Disassemble and assemble the PC back to working condition. Students should be able to trouble shoot the computer and identify working and non-working parts. Student should identify the problem correctly by various methods available. Students should record the process of assembling and trouble shooting a computer.

**Task 3:** Student should install Linux on the computer. Student may install another operating system (including proprietary software) and make the system dual boot or multi boot. Students should record the entire installation process.

**Task 4:** Students should record the various features that are supported by the operating system installed and submit it.

**Networking and Internet**

**Task 5:** Students should connect two computers directly using a cable or wireless connectivity and share information. Students should connect two or more computers using a switch/hub and share information. Crimping activity, logical configuration etc should be done by the student. The entire process has to be documented.

**Task 6:** Student should access the Internet for Browsing. Students should search the Internet for required information. Students should be able to create e-mail account and send email. If Intranet mailing facility is supported in the organization, then students should share the information using it. If the operating system supports sending messages to multiple users (LINUX supports it) in the same network, then it should be done by the student. Students are expected to submit the information about different browsers available, their features and search process in different languages.

**Task 7:** Students should download freely available Antivirus software, install it and use it to check for threats to the computer being used. Students should submit information about the features of the antivirus used, installation process, about virus definitions, virus engine etc.

**Productivity tools**

**Task 8: Word Processor:** Students should be able to create documents using the word processor tool. Some of the tasks that are to be performed are inserting and deleting the characters, words and lines, Alignment of the lines, Inserting header and Footer, changing the font, changing the colour, including images and tables in the word file, making page setup, copy and paste block of text, images, tables etc, linking the images which are present in other directory, formatting paragraphs, spell checking, etc. Students should be able to prepare project cover pages etc at the end of the task. Students should submit a user manual of the word processor considered.

**Task 9: Spreadsheet:** Students should be able to create, open, save the application documents and format them as per the requirement. Some of the tasks that may be practiced are Managing the worksheet environment, creating cell data, inserting and deleting cell data, format cells, adjust the cell size, applying formulas and functions, preparing charts, sorting cells. Students



should submit a user manual of the Spreadsheet application considered.

**Task 10: Presentations :** creating, opening, saving and running the presentations; Selecting the style for slides, formatting the slides with different fonts, colours; creating charts and tables, inserting and deleting text, graphics and animations; bulleting and numbering; hyperlinking, running the slide show, setting the timing for slide show. Students should submit a user manual of the Presentation tool considered.

**References:**

1. "Introduction to Computers", Peter Norton, Mc Graw Hill
2. "LaTeX Companion" – Leslie Lamport, PHI/Pearson.
3. "MOS study guide for word, Excel, Powerpoint & Outlook Exams", Joan Lambert, Joyce Cox, PHI.
4. "Introduction to Information Technology", ITL Education Solutions limited, Pearson Education.
5. "Networking your computers and devices", Rusen, PHI
6. "Trouble shooting, Maintaining & Repairing PCs", Bigelows, TMH.

**(17FHS201) ORGANIZATION STRUCTURE AND HUMAN RESOURCE MANAGEMENT**

**Objective:** The main aim of this course is to equip the student with the basic understanding about the concepts of Organizational design and Structure, Management, and the fundamental knowledge of Human Resource Management.

**UNIT- I: Organization Design and Structure:** Organisation- meaning- definition-Formal and Informal Organization- Organisation as a system and process- Concept of Organisational design and Structure- - types of organizational structures - Mechanistic and Organistic structures- Division of labour – Departmentation- Span of Management- Delegation of Authority- Centralisation and Decentralisation.

**UNIT-II: Introduction to Management:** Meaning-definition- importance- evolution of Management thought- Scientific Management-Henry Fayol’s Principles of Management  
-Functions of Management- Planning- Organising-Directing- Staffing- and Controlling

**UNIT-III: Human Resource Management:** Meaning - definition- functions- evolution of HRM - Human Resource Planning(HRP)-Meaning-definition-Steps in HRP- Job Analysis process and methods- Employee Recruitment –Meaning- definition- Sources of Recruitment-internal and external sources- Methods of Recruitment- Factors affecting recruitment-Selection-meaning- definition-process of selection-different tests used for selection- Employee Induction -Placement.

**UNIT-IV: Employee Training and Development:** Meaning- importance-need- objectives and policies-principles- training methods- On-the-job and Off-the-job training methods- Career planning- Definition, succession planning, elements of career development programmes -steps in career development system-advantages and limitations.

**UNIT-V: Performance Appraisal:** Meaning- need- purpose- methods of performance Appraisal-essentials of a good performance appraisal- Benefits of performance appraisal system- Wage and Salary Administration-Concept-Meaning- objectives- Principles.

**Learning outcome:** After completion of the course, the student will be able to understand various aspects of organizational structure, fundamental concepts of management and Human Resource Management.

**TEXT BOOKS:**

1. James A.F. Stoner, R.Edward Freeman and Daniel R.Gilbert, jr, Management PHI-India.
2. Subbarao.P, Human Resource Management HPH.

**REFERENCES:**

1. Prasad.L.M , Principles & Practice of Management , 7e, S.Chand.
2. Industrial Business Management, Martand T Telsang, S.Chand.
3. Human Resources Management, Dr L.M.Prasad, S.Chand.
4. Dynamic Personnel Administration, Rudrabasavaraj MN, Himalaya.
5. Personnel Management, Mamoria & Gankar, HPH, 2009.

**(17F00201) DATA STRUCTURES**

**Course Objective**

- To develop skills to design and analyze linear and non linear data structures.
- Develop algorithms for manipulating linked lists, stacks, queues, trees and graphs.
- Develop recursive algorithms as they apply to trees and graphs.
- To get acquaintance with frequently used data structures in Software Engineering and Programming practices.
- To Strengthen the ability to identify and apply the suitable data structure for the given real world problem
- To develop a base for advanced computer science study.

**UNIT I**

**INTRODUCTION TO DATA STRUCTURES:** - Basic concepts Overview: System Life Cycle Pointers and Dynamic Memory Allocation. Pointers: Dynamic Memory Allocation, Pointers Can Be Dangerous. Algorithm Specification: Introduction, Recursive Algorithms, Data Abstraction. Performance Analysis: Space Complexity, Time Complexity, Asymptotic Notation. Practical Complexities: Performance Measurement, Clocking, Generating Test Data.

**UNIT II**

**ARRAYS:-**

The Abstract Data Type: Arrays in C, Dynamically Allocated Arrays: One-dimensional Arrays, Two-dimensional Arrays.

**STACKS & QUEUES:** Stacks: Stacks Using Dynamic Arrays.

**Queues:** Circular Queues Using Dynamic Arrays: A Mazing Problem, Evaluation of Expressions: Expressions, Evaluating Postfix Expressions, Multiple Stacks and Queues.

**UNIT III**

**LINKED LISTS:** Singly Linked Lists and Chains, Representing Chains in C Linked Stacks and Queues.

Polynomials: Polynomial Representation, Adding Polynomials, Erasing Polynomials, Circular List Representation of Polynomials.

Additional List Operations: Operations for Chains, Operations for Circularly Linked Lists, Equivalence Classes. Sparse Matrices: Sparse Matrix Representation, Sparse Matrix Input, Sparse Matrix Output, Erasing a Sparse Matrix, Doubly Linked Lists.

**UNIT IV**

**TREES & GRAPHS:** - TREES: Introduction, Binary Trees: The Abstract Data Type, Properties of Binary Trees, Binary Tree Representations. Binary Tree Traversals, Additional Binary Tree Operations, Threaded Binary Trees, Heaps, Binary Search Trees, Selection Trees, Forests.

GRAPHS: The Graph Abstract Data Type, Introduction, Elementary Graph Operations, Minimum Cost Spanning Trees, Shortest Paths and Transitive Closure.

**UNIT V**

**SORTING & SEARCHING:** Introduction, Insertion Sort, Quick Sort, Merge Sort, Heap Sort, Sorting on Several Keys, List and Table Sorts, External Sorting.

Searching: Linear Search, Binary Search, Interpolation Search, Fibonacci Search.

**Text Books :**

1. “ Fundamentals of Data Structures in C”, Horowitz, Sahni & Anderson-Freed - University Press.
2. “Data Structures Using C”, Reema Thareja- Oxford Higher Education.

**REFERENCE BOOKS:**

1. Data Structures and Algorithms Using C++ by Ananda Rao Akepogu and Radhika Raju Palagiri
2. Classic Data Structure by D. Samanta, Eastern Economy Edition.
3. Data Structures and Algorithms Made Easy by Narasimha Karumanchi, Second Edition, Written in C/C++, CareerMonk Publications, Hyderabad
4. ADTs, Data Structures and Problem Solving with C++, Larry Nyhoff, Pearson
5. Data Structures using C++, D.S.Malik, 2<sup>nd</sup> Edition, Cengage Learning
6. Data Structures through C++, Yashavant P.Kanetkar, BPB Publication
7. Data Structures using C and C++, Yedidyah Langsam.Moshe J.Augenstein Aaron M.Tenenbaum, 2<sup>nd</sup> Edition,PHI
8. Data Structures using C & C++, Rajesh K.Shukla, Wiley-India

**(17F00202) COMPUTER ORGANIZATION**

**Course Objectives:**

- To understand how computers are constructed out of a set of functional units
- To understand how these functional units operate, interact and communicate
- To understand the factors and trade-offs that affect computer performance
- To understand concrete representation of data at the machine level
- To understand how computations are actually performed at the machine level
- To understand how problems expressed by humans are expressed as binary strings in a machine.
- Understand the system interconnection and the different I/O techniques
- Explain the functioning and programming of the INTEL-8086
- *Understand the design of processors, the structure and operation of memory and virtual memory, cache, storage, and pipelining, system integration, and peripherals*
- Identify the different architectural and organizational design issues that can affect the performance of a computer such as Instruction Sets design, Pipelining, RISC architecture, and Superscalar architecture.
- Design an interconnection networks and multiprocessors.

**UNIT I**

**NUMBER SYSTEMS AND COMPUTER ARITHMETIC**- Signed and unsigned numbers, Addition and subtraction, multiplication, division, Floating point representation, logical operation, Gray code, BCD codes, Error detecting codes, Boolean algebra, Simplification of Boolean expressions, K-Maps, Combinational and Sequential Circuits- decoders, Encoders, Multiplexers, Half and Full adders, Shift registers, Sequential circuits- flip-flops.

**UNIT II**

**MEMORY ORGANIZATION**-Memory hierarchy, Main memory-RAM, ROM chips, Memory address map, memory contention to CPU, Associative Memory-Hardware logic, match, read and write logic, Cache Memory-Associative mapping, Direct mapping, Set-associative mapping, hit and miss ratio.

**UNIT III**

**BASIC CPU ORGANIZATION**-Introduction to CPU, Instruction formats-INTEL-8086 CPU architecture-Addressing modes - generation of physical address- code segment registers, Zero, one, two, and three address instructions. INTEL 8086 ASSEMBLY LANGUAGE INSTRUCTIONS-Data transfer instructions-input- output instructions, address transfer, Flag transfer, arithmetic, logical, shift, and rotate instructions.conditional and unconditional transfer, iteration control, interrupts and process control instructions, assembler directives, Programming with assembly language instructions.

**UNIT IV**

**INPUT -OUTPUT ORGANIZATION**-Peripheral devices, input-output interface-I/O Bus and interface modules, I/O versus Memory bus, isolated versus memory mapped I/O, Modes of transfer-Programmed I/O, Interrupt-initiated I/O, priority interrupts-Daisy chaining, parallel priority, interrupt cycle, DMA-DMA control, DMA transfer, Input output processor-CPU-IOP communication.

**UNIT V**

**PIPELINE AND VECTOR PROCESSING** : Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.

**MULTI PROCESSORS** : Characteristics or Multiprocessors, Interconnection Structures, Interprocessor Arbitration, InterProcessor Communication and Synchronization Cache Coherence, Shared Memory Multiprocessors.

**TEXT BOOKS:**

1. Computer System Architecture, M. Morris Mano , 3rd Edition, Pearson Education,2008.
2. Microprocessors and Interfacing, Douglas Hall, Tata McGraw-Hill.

**REFERENCE BOOKS:**

1. Computer Organization, Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Vth Edition, McGraw Hill.
2. Fundamentals of Computer Organization and Design, Sivarama P.Dandamudi ,Springer Int. Edition.
3. Computer Organization and Architecture, William Stallings, 8<sup>th</sup> Edition, Pearson,2007.
4. Digital Design, M. Morris Mano, Pearson Education .
5. Computer Organization and Design ,D.A.Paterson and John L.Hennessy,Elsevier.  
Computer Architecture and Organization,M.Murdocca andV.Heuring,Wiley Inda.

(17F00203) OPERATIONS RESEARCH

**Course Objectives:**

- To introduce the methods of Operations Research.
- Emphasize the mathematical procedures of non linear programming search techniques.
- Introduce advanced topics such as Probabilistic models and dynamic programming.

**Prerequisites:**

- Probability and Statistics

**UNIT I**

OR Models, LP & applications, Simplex Method, M-Method, 2- Phase Method, Special cases in Simplex Method, Sensitivity Analysis

**UNIT II**

**Transportation Model:** Definition of the Transportation Model, Nontraditional Transportation Models, The Transportation Algorithm, The Assignment Model, The Transshipment Mode.

**Network Model:** Scope and Definition of Network Models, Minimal Spanning Tree Algorithm, Shortest-Route Problem, Maximal flow model, CPM and PERT.

**UNIT III**

**Advanced Linear Programming:** Simplex Method Fundamentals, Revised Simplex Method, Bounded-Variables Algorithm, Parametric Linear Programming.

**Integer Linear Programming:** Illustrative Applications, Integer Programming Algorithms - Branch-and-Bound (B&B) Algorithm, Cutting-Plane Algorithm, Computational Considerations in ILP.

**UNIT IV**

Heuristic Programming – Greedy Heuristic, Meta Heuristic – Tabu Search Algorithm, Simulated Annealing Algorithm, Genetic Algorithm, Application of Metaheuristics to Integer Linear Programs, Constraint Programming.

**UNIT V**

**Travelling Salesperson Problem:** Example Application Of TSP, TSP Mathematical Model, Exact TSP Algorithms.

**Deterministic Dynamic Programming:** Recursive Nature of Computations in DP, Forward and Backward Recursion, Selected DP Applications, Problem of Dimensionality.

**TEXT BOOKS :**

1. Operations Research An Introduction, By Hamdy A.Taha, Pearson 9<sup>th</sup> Edition.

## REFERENCE BOOKS:

1. Pradeep Prabhakar Pai, Operations Research – principles and Practice, Oxford University Press, 2012.
2. A.M. Natarajan, P. Balasubramani, A. Tamilarasi, “Operations Research”, Pearson Education.
3. P Sankara Iyer, ”Operations Research”, Tata McGraw-Hill, 2008.
4. N.V.S. Raju, “Operations Research”, HI-TECH, 2002.
5. Col. D. S. Cheema, “Operations Research”, Laxmi Publications Ltd., 2005.
6. F.S. Hillier, G.J. Lieberman, “Introduction to Operations Research – 8ed”, TMH.
7. H.S. Kasana & K.D. Kumar, “Introductory Operations Research – Theory and applications”, Springer, 2003, rp2005.
8. Billy E. Gillett, “Introduction to Operations Research – A Computer-Oriented Algorithmic Approach”, Tata McGraw-Hill, 1979, rp2004.
9. A.B.Rao, Operations Research, Jaico .
10. Ravindran,Phillips,Solberg, Operations Research, 2<sup>nd</sup> edition,Wiley India.
11. W.L.Winston, Operations Research, 4<sup>th</sup> edition,Cengage Learning.
12. R. Panneerselvam, “Operations Research”, PHI-2e, 2006, rp2008.
13. ANITHA H S, “Operations Research”, EXEL books, 2011.



**(17F00204) JAVA PROGRAMMING**

**Course Objectives:**

- Study the syntax, semantics and features of Java Programming Language
- Study the Object Oriented Programming Concepts of Java Programming language
- Learn the method of creating Multi-threaded programs and handle exceptions
- Learn Java features to create GUI applications & perform event handling

**Course Outcomes:**

- Use object oriented approach for solving problems and implementing them
- Ability to write Efficient programs that handle exceptions
- Create user friendly interface

**Unit - I :**

The Java Language, The key attributes of object oriented programming language, JDK, simple program, Java keywords, identifiers in java, the java class libraries, introducing data types and operators, program control structures

**Unit – II:**

Introducing classes, objects, and methods, Arrays, multidimensional arrays, strings, a closer look at methods and classes, Inheritance

**Unit – III :**

Interface fundamentals, creating and implementing an interface, using interface references, implementing multiple interfaces, constants in interfaces, interfaces can be extended, nested interfaces, final thoughts on interface, packages, Exception handling

**Unit – IV :**

Byte streams and character streams, byte and character stream classes, using byte streams for reading and writing, reading and writing binary data, random access files, using character streams for file i/o, Multi threaded programming, Applet basics, a complete applet skeleton, applet initialization and termination, requesting repainting, using the status window, passing parameters to applets

**Unit – V :**

Swings – the origin and design philosophy of swing, components and containers, layout managers, event handling, using a push button, jtextfield, jlabel and image icon, the swing buttons, jtext field, jscrollpane, jlist, jcombobox, trees, jtable, an overview of jmenubar, jmenu and jmenuitem, creating a main menu, showmessagedialog, showconfirmdialog, showinputdialog, showoptiondialog, jdialo, create a modeless dialog

**Text Books :**

1. “Java Fundamentals A Comprehensive Introduction” Herbert Schildt and Dale Skrien, Mc Graw Hill.
2. “Java – How to Program”, Paul Deitel, Harvey Deitel, PHI

## **Reference Books :**

1. "Programming with Java" T.V.Suresh Kumar, B.Eswara Reddy, P.Raghavan Pearson Edition.
2. "Core Java", Nageswar Rao, Wiley Publishers.
3. "Thinking in Java", Bruce Eckel, Pearson Education.
4. "Programing In java", Malhotra, Oxford University Press
5. "Head First Java", Kathy Sierra, Bert Bates, O'Reilly
6. "SCJP – Sun Certified Programmer for Java Study guide" – Kathy Sierra, Bert Bates, McGrawHill
7. "Java in Nutshell", David Flanagan, O'Reilly
8. "Core Java : Volume I – Fundamentals, Cay S. Horstmann, Gary Cornell, The Sun Micro Systems Press

**(17F00205) DATA STRUCTURES LAB**

**Course Objectives:**

- To write and execute programs in C to solve problems using data structures such as arrays, linked lists, stacks, queues, trees, graphs, hash tables and search trees.
- To write and execute write programs in C to implement various sorting and searching methods
- Exemplify and implement how abstract data types such as stack, queue and linked list can be implemented to manage the memory using static and dynamic allocations
- Understand and distinguish the conceptual and applicative differences in trees, binary trees, and binary search trees
- Examine and analyze why self balancing trees are necessary in real world dynamic applications
- Develop and compare the comparison-based search algorithms and sorting algorithms

Week 1

- Write a Program to Implement Stack Operations by using Array and Linked Lists.
- Write a Program to Implement the Operations of Double Linked Lists

Week 2

- Write a C program that uses stack operations to convert a given infix expression into its postfix
- Write a Program to Implement Queue Operations by using Array and Linked Lists.

Week 3

Write a Program to Implement Circular Queue Operations by using Array and Linked Lists.

Week 4

Write a Program to Sort the set of elements by using  
i). Quick Sort    ii). Heap Sort.    iii). Merge Sort

Week 5

Write a Program to Implement the Binary Search Tree Operations.

Week 6

Write a Program to Perform the Tree Traversal Techniques by using the Iterative Method

Week 7

Write C programs for implementing the following graph traversal algorithms:  
a)Depth first traversal    b)Breadth first traversal

Week 8

Write a Program to Implement All functions of a Dictionary by using Hashing

Week 9

Write a Program to Implement Skip List Operations.

Week 10

Write a Program to Implement Insertion, Deletion and Search Operations on SPLAY Trees.

Week 11

Write a program to Implement Insertion and Deletion Operations on AVL Trees

Week 12

Write a Program to Implement Insertion and Deletion Operations on B – Trees

Note: Use Classes and Objects to implement the above programs.

**Reference Books:**

1. Data Structures and Algorithms Using C++ by Ananda Rao Akepogu and Radhika Raju Palagiri.
2. Object Oriented Programming with ANSI & Turbo C++, Ashok N.Kamthane, Pearson Education
3. Data Structures using C++, D.S.Malik, 2<sup>nd</sup> Edition, Cengage Learning
4. Data Structures through C++, Yashavant P.Kanetkar, BPB Publication
5. Data Structures using C and C++, Yedidyah Langsam.Moshe J.Augenstein Aaron M.Tenenbaum, 2<sup>nd</sup> Edition,PHI
6. Data Structures using C & C++, Rajesh K.Shukla, Wiley-India
7. ADTs, Data Structures and Problem Solving with C++, Larry Nyhoff, Pearson

**(17F00206) JAVA PROGRAMMING LAB**

**Course Objectives:**

- To introduce java compiler and eclipse platform
- To impart hand on experience with java programming

**Note:**

1. **IDEs are not mandatory, encourage the use of Eclipse or Netbean platform**
2. **The list suggests the minimum program set. Hence, the concerned staff is requested to add more problems to the list as needed**

**Week-1:**

1. Use Eclipse or Netbean platform and acquaint with the various menus. Create a test project, add a test class and run it. See how you can use auto suggestions, auto fill. Try code formatter and code refactoring like renaming variables, methods and classes. Try debug step by step with java program to find prime numbers between 1 to n.

**Week-2:**

1. Write a Java program that prints all real and imaginary solutions to the quadratic equation  $ax^2 + bx + c = 0$ . Read in a, b, c and use the quadratic formula.
2. Write a Java program for sorting a given list of names in ascending order
3. Write a java program to accept a string from user and display number of vowels, consonants, digits and special characters present in each of the words of the given text.

**Week -3:**

1. Write a java program to make rolling a pair of dice 10,000 times and counts the number of times doubles of are rolled for each different pair of doubles.  
*Hint: Math.random()*
2. Write java program that inputs 5 numbers, each between 10 and 100 inclusive. As each number is read display it only if it's not a duplicate of any number already read display the complete set of unique values input after the user enters each new value.
3. Write a java program to read the time intervals (HH:MM) and to compare system time if the system time between your time intervals print correct time and exit else try again to repute the same thing. By using StringTokenizer class

**Week-4:**

1. Write a java program to split a given text file into n parts. Name each part as the name of the original file followed by .part<n> where n is the sequence number of the part file.
2. Write java program to create a super class called Figure that receives the dimensions of two dimensional objects. It also defines a method called area that computes the area of an object. The program derives two subclasses from Figure. The first is Rectangle and second is Triangle. Each of the sub class overridden area() so that it returns the area of a rectangle and a triangle respectively.
3. Write a Java program that creates three threads. First thread displays "Good Morning" every one second, the second thread displays "Hello" every two seconds and the third thread displays "Welcome" every three seconds

**Week-5:**

1. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication
2. Write a java program to find and replace pattern in given file,
3. Use inheritance to create an exception super class called EexceptionA and exception sub class ExceptionB and ExceptionC, where ExceptionB inherits from ExceptionA and ExceptionC inherits from ExceptionB. Write a java program to demonstrate that the catch

block for type ExceptionA catches exception of type ExceptionB and ExceptionC

**Week-6:**

1. Write a java program to convert an ArrayList to an Array.
2. Write a Java Program for waving a Flag using Applets and Threads
3. Write a Java Program for Bouncing Ball (The ball while moving down has to increase the size and decrease the size while moving up)

**Week-7:**

1. Write a Java Program for stack operation using Buttons and JOptionPane input and Message dialog box.
2. Write a Java Program to Addition, Division, Multiplication and subtraction using JOptionPane dialog Box and Textfields.

**Week-8:**

1. Write a Java Program for the blinking eyes and mouth should open while blinking.
2. Implement a Java Program to add a new ball each time the user clicks the mouse. Provided a maximum of 20 balls randomly choose a color for each ball.

**Week-9:**

1. Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using Jtable component
2. Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the textfields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a NumberFormatException. If Num2 were Zero, the program would throw an ArithmeticException Display the exception in a message dialog box.

**Week-10:**

1. Write a Java Program to implement the opening of a door while opening man should present before hut and closing man should disappear.
2. Write a Java code by using JTextField to read decimal value and converting a decimal number into binary number then print the binary value in another JTextField

**Week-11:**

1. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, \*, % operations. Add a text field to display the result.
2. Write a Java program for handling mouse events.

**Week-12:**

1. Write a java program establish a JDBC connection, create a table student with properties name, register number, mark1, mark2, mark3. Insert the values into the table by using the java and display the information of the students at front end.

**Text Books :**

1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI
2. Java The Complete Reference” by Herbert Schildt, TMH, 8<sup>th</sup> Edition

**Reference Books :**

1. Introduction to Java programming, Sixth edition, Y.Daniel Liang, Pearson Education
2. Programming in java Sachine
3. Big Java, 2<sup>nd</sup> edition, Cay Horstmann, Wiley Student Edition, Wiley India Private Limited.
4. Introduction to Programming with Java, J.Dean & R.Dean, McGraw Hill education.
5. Java Programming, D S Malik, cengage learning, India Edition

## 1. INTRODUCTION

The introduction of the Advanced Communication Skills Lab is considered essential at 3<sup>rd</sup> year level. At this stage, the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context.

The proposed course should be a laboratory course to enable students to use 'good' English and perform the following:

- Gathering ideas and information to organise ideas relevantly and coherently.
- Engaging in debates.
- Participating in group discussions.
- Facing interviews.
- Writing project/research reports/technical reports.
- Making oral presentations.
- Writing formal letters.
- Transferring information from non-verbal to verbal texts and vice-versa.
- Taking part in social and professional communication.

## 2. OBJECTIVES:

This Lab focuses on using multi-media instruction for language development to meet the following targets:

- To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
- Further, they would be required to communicate their ideas relevantly and coherently in writing.
- To prepare all the students for their placements.

## 3. SYLLABUS:

The following course content to conduct the activities is prescribed for the Advanced Communication Skills (ACS) Lab:

### UNIT-I: COMMUNICATIVE COMPETENCY

1. Reading Comprehension
2. Listening comprehension
3. Vocabulary for competitive purpose
4. Spotting errors

### UNIT-II: TECHNICAL WRITING

1. Report writing
2. Curriculum vitae

3. E-mail writing
4. Abstract & Synopsis Writing
5. Reviewing ( Book/Film)

#### **UNIT-III: PRESENTATIONAL SKILLS**

1. Oral presentation
2. Power point presentation
3. Poster presentation
4. Stage dynamics
5. Body Language

#### **UNIT-IV: CORPORATE SKILLS**

1. Telephonic skills
2. Net Etiquettes
3. SMART Goal setting
4. Time Management
5. Negotiation Skills

#### **UNIT-V: GETTING READY FOR JOB**

1. Group discussions-II
2. Interview skills
3. Answering Strategies
4. Mock Interviews

#### **4. LEARNING OUTCOMES:**

- Accomplishment of sound vocabulary and its proper use contextually
- Flair in Writing and felicity in written expression.
- Effective Speaking Abilities
- Enhanced job prospects.

#### **5. MINIMUM REQUIREMENT:**

The Advanced Communication Skills (ACS) Laboratory shall have the following infra-structural facilities to accommodate at least 60 students in the lab:

- Spacious room with appropriate acoustics.
- Round Tables with movable chairs
- Audio-visual aids
- LCD Projector
- Public Address system
- P – IV Processor, Hard Disk – 80 GB, RAM–512 MB Minimum, Speed – 2.8 GHZ
- T. V, a digital stereo & Camcorder
- Headphones of High quality

#### **6. SUGGESTED SOFTWARE:**

The software consisting of the prescribed topics elaborated above should be procured and used.

1. K-VAN SOLUTIONS-Advanced communication lab
2. DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.
3. TOEFL & GRE( KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
4. Train2success.com



## **7. BOOKS RECOMMENDED:**

1. Objective English for Competitive Exams, Hari Mohana Prasad, 4<sup>th</sup> edition, Tata Mc Graw Hill.
2. Technical Communication by Meenakshi Raman & Sangeeta Sharma, O U Press 2009.
3. Books on TOEFL/GRE/GMAT/CAT/IELTS by Barron's/DELTA/Cambridge University Press.2012.
4. Soft Skills for Everyone, Butterfield Jeff, Cengage Publications, 2011.
5. Practice Psychometric Tests: How to familiarize yourself with genuine recruitment tests, 2012.
6. Management Shapers Series by Universities Press (India) Pvt Ltd., Himayatnagar, Hyderabad 2008.
7. Handbook for Technical Writing by David A McMurrey & Joanne Buckely CENGAGE Learning 2008.
8. English for Technical Communication for Engineering Students, Aysha Vishwamohan, Tata Mc Graw-Hill 2009.
9. Word Power Made Handy, Shalini Verma, S Chand Publications, 2011.
10. Effective Technical Communication, Ashrif Rizvi, TataMcGrahill, 2011.