

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

MASTER OF COMPUTER APPLICATIONS
COURSE STRUCTURE AND SYLLABUS

I Year – II Semester

Category	Course Title	Int. marks	Ext. marks	L	P	C
Core Course I	Data Structures and Algorithms	25	75	4	--	4
Core Course II	Object Oriented programming using C++	25	75	4	--	4
Core Course III	Scripting Languages	25	75	4	--	4
Core Course IV	Operations Research	25	75	4	--	4
Core Course V	Software Engineering	25	75	4	--	4
Laboratory I	Data Structures Lab Using C++	25	75	--	4	2
Laboratory II	Software Engineering Lab	25	75	--	4	2
Laboratory III	English Language Communication Skills Lab	25	75	--	4	2
Total Credits				20	6	26

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

MCA - I Year - II Sem.

DATA STRUCTURES AND ALGORITHMS

Objectives:

- 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 the behavior of data structures such as stacks, queues, trees, hash tables, search trees, Graphs and their representations.
- To choose the appropriate data structure for a specified application.
- To understand and analyze various searching and sorting algorithms.
- To write programs in C to solve problems using data structures such as arrays, linked lists, stacks, queues, trees, graphs, hash tables, search trees.

Outcomes:

- Learn how to use data structure concepts for realistic problems.
- Ability to identify appropriate data structure for solving computing problems in respective language.
- Ability to solve problems independently and think critically.
- Be able to analyze algorithms and improve the efficiency of algorithms.
- Apply different designing methods for development of algorithms to realistic problems, such as divide and conquer, greedy and etc.
- Ability to understand and estimate the performance of algorithm

UNIT I

Basic concepts-Data types, Abstract Data Types, Data structures, Algorithms, Performance analysis- time complexity and space complexity, Asymptotic Analysis-Big O, Omega and Theta notations.

Linear data structures- Linear Lists, Sequential and Linked allocation The list ADT, array and linked Implementations, Singly Linked Lists-Operations-Insertion, Deletion, Doubly Linked Lists-

Operations- Insertion, Deletion, Stack ADT, definitions, operations, array and linked implementations, applications-infix to postfix conversion, recursion implementation, Queue ADT, definitions and operations ,array and linked Implementations.

UNIT II

Non Linear data structures- Trees – Basic Terminology, Binary tree ADT, array and linked representations, traversals, threaded binary trees, Disjoint Sets, Union and Find algorithms, Priority Queues-Definition, ADT, Realizing a Priority Queue using Heap.

Graphs – Introduction, Basic Terminology, Graph Representations- Adjacency matrix, Adjacency lists, Adjacency multi lists, Graph traversals- DFS and BFS.

UNIT III

Searching- Linear Search, Binary Search, Hashing-Introduction, hash tables, hash functions, collision resolution methods, Comparison of Searching methods.

Sorting- Bubble Sort, Insertion Sort, Selection Sort, Heap Sort, Radix Sort. Algorithm Design method- Divide and Conquer method-applications- Quick sort, Merge sort, Comparison of Sorting methods, Model for External Sorting.

UNIT IV

Search Trees-Binary Search Trees, Definition, ADT, Implementation, Operations- Searching, Insertion and Deletion, AVL Trees, Definition, Operations – Insertion and Searching, B-Trees, Definition, B-Tree of order m, operations- insertion and deletion, Introduction to Red-Black and Splay Trees(Elementary treatment), Comparison of Search Trees.

UNIT V

Algorithm Design methods-Greedy method-applications-Kruskal's Algorithm for Minimum cost Spanning trees, Job Sequencing with deadlines, Single Source Shortest path problem, Dynamic Programming method-applications-Ordering matrix multiplications, Optimal Binary Search Trees, APSP problem.

Text Processing - Pattern matching algorithm- The Knuth-Morris-Pratt algorithm, Tries- Standard Tries, Compressed Tries, Suffix tries.

TEXT BOOKS:

1. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, 3rd edition, Pearson Education. Ltd.,
2. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and D.Mount, Wiley Student edition, seventh edition, John Wiley and Sons.
3. Data structures, Algorithms and Applications in C++, S.Sahani, Universities Press.

REFERENCE BOOKS:

1. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek, Cengage Learning.
2. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
3. Data structures, algorithms and OOP, G.L.Heileman, TMH edition.
4. Data Structures using C++, D.S. Malik, Cengage Learning, India Edition.
5. Data structures with C++ Using STL, 2nd edition, W.H.Ford and W.R.Topp, Pearson/PH.I
6. Mastering Algorithms with C,K.Loudon, O'Reilly, SPD pvt. Ltd.
7. Advanced Data structures & Algorithms in C++, V.V.Muniswamy, Jaico Publishing House.
8. An Introduction to Data structures and Algorithms, J.A.Storer, Springer.

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OBJECT ORIENTED PROGRAMMING USING C++

UNIT I

Different paradigms for problem solving, need for OOP paradigm, classes and instances, fundamental characteristics of OOP (Alan key), differences between OOP and Procedure Oriented Programming.

C++ Basics: Structure of a C++ program, Data types, Declaration of variables, Expressions, Operators, Operator Precedence, Evaluation of expressions, Type conversions, Pointers, Arrays, Pointers and Arrays, Strings, Structures, References. Flow control statements- if, switch, while, for, do, break, continue, goto statements.

UNIT II

C++ Functions-Scope of variables, Parameter passing methods, Default arguments, inline functions, Recursive functions, Pointers to functions.

C++ Classes And Data Abstraction: Class definition, Class objects, Class scope, this pointer, Friends to a class, Static class members, Constant member functions, Constructors and Destructors, Data abstraction, ADT and information hiding.

UNIT III

Dynamic memory allocation and deallocation operators-new and delete, Dynamic creation and destruction of objects, Preprocessor directives, command line arguments, name spaces.

Polymorphism: Function overloading, Operator overloading, Generic programming-necessity of templates, Function templates and class templates.

UNIT IV

Inheritance: Defining a class hierarchy, Different forms of inheritance, Defining the Base and Derived classes, Access to the base class members, Base and Derived class construction, Destructors, Virtual base class.

Virtual Functions And Run Time Polymorphism: Overriding, Static and Dynamic bindings, Base and Derived class virtual functions, Dynamic binding through virtual functions, Virtual function call mechanism, Pure virtual functions, Abstract classes, Virtual destructors.

UNIT V

C++ I/O: I/O using C functions, C++ Stream classes hierarchy, Stream I/O, File streams and String streams, File Operations, Overloading << and >> operators, Error handling during file operations, Formatted I/O.

Exception Handling: Benefits of exception handling, Throwing an exception, The try block, Catching an exception, Exception objects, Exception specifications, Stack unwinding, Rethrowing an exception, Catching all exceptions.

TEXT BOOKS:

1. C++, The Complete Reference, 4th Edition, Herbert Schildt, TMH.
2. Object Oriented Programming in C++, 4th Edition, R.Lafore, Pearson Education

REFERENCE BOOKS:

1. An Introduction to OOP, 3rd Edition, T. Budd, Pearson Education, 2008.
2. Programming Principles and Practice Using C++, B.Stroutstrup, Pearson Education.
3. Problem solving with C++, 6th Edition, Walter Savitch, Pearson Education, 2007.
4. Mastering C++, K.R.Venu Gopal, Raj Kumar and T.Ravi Shankar, TMH.
5. OOP in C++, 3rd Edition, T.Gaddis, J.Walters and G.Muganda, Wiley DreamTech Press.
6. An Introduction to OOP in C++ with applications in Computer Graphics, 2nd Edition, G.M.Seed, Springer.
7. Programming with ANSI C++, B.Trivedi, Oxford Press.
8. Programming in C++, M.T.Somasekara, PHI.

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SCRIPTING LANGUAGES

Objectives:

The course demonstrates an in depth understanding of the tools and the scripting languages necessary for design and development of applications dealing with Bio-information/ Bio-data. The instructor is advised to discuss examples in the context of Bio-data/ Bio-information application development.

UNIT I

Introduction to PERL and Scripting Scripts and Programs, Origin of Scripting , Scripting Today, Characteristics of Scripting Languages, Uses for Scripting Languages, Web Scripting, and the universe of Scripting Languages. PERL- Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern and regular expressions, subroutines.

UNIT II

Advanced perl: Finer points of looping, pack and unpack, file system, eval, data structures, packages, modules, objects, interfacing to the operating system, Creating Internet ware applications, Dirty Hands Internet Programming, security Issues.

PHP Basics

PHP Basics- Features, Embedding PHP Code in your Web pages, Outputting the data to the browser, Data types, Variables, Constants, expressions, string interpolation, control structures, Function, Creating a Function, Function Libraries, Arrays, strings and Regular Expressions.

UNIT III

Advanced PHP Programming: PHP and Web Forms, Files, PHP Authentication and Methodologies - Hard Coded, File Based, Database Based, IP Based, Login Administration, Uploading Files with PHP, Sending Email using PHP, PHP Encryption Functions, the Mcrypt package, Building Web sites for the World.

UNIT IV

TCL : TCL Structure, syntax, Variables and Data in TCL, Control Flow, Data Structures, input/output, procedures, strings, patterns, files, Advance TCL- eval, source, exec and uplevel commands, Name spaces, trapping errors, event driven programs, making applications internet aware, Nuts and Bolts Internet Programming, Security Issues, C Interface.

Tk-Visual Tool Kits, Fundamental Concepts of Tk, Tk by example, Events and Binding , Perl-Tk.

UNIT V

Python: Introduction to Python language, python-syntax, statements, functions, Built-in-functions and Methods, Modules in python, Exception Handling.

Integrated Web Applications in Python – Building Small, Efficient Python Web Systems, Web Application Framework.

TEXT BOOKS:

1. The World of Scripting Languages, David Barron, Wiley Publications.
2. Python Web Programming, Steve Holden and David Beazley, New Riders Publications.
3. Beginning PHP and MySQL, 3rd Edition, Jason Gilmore, Apress Publications (Dream tech.).

REFERENCE BOOKS:

1. Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP, J.Lee and B.Ware (Addison Wesley) Pearson Education.
2. Programming Python, M.Lutz, SPD.
3. PHP 6 Fast and Easy Web Development, Julie Meloni and Matt Telles, Cengage Learning Publications.

4. PHP 5.1, I.Bayross and S.Shah, The X Team, SPD.
5. Core Python Programming, Chun, Pearson Education.
6. Guide to Programming with Python, M.Dawson, Cengage Learning.
7. Perl by Example, E.Quigley, Pearson Education.
8. Programming Perl, Larry Wall, T.Christiansen and J.Orwant, O'Reilly, SPD.
9. Tcl and the Tk Tool kit, Ousterhout, Pearson Education.
- 10.PHP and MySQL by Example, E.Quigley, Prentice Hall (Pearson).
- 11.Pperl Power, J.P.Flynt, Cengage Learning.
12. PHP Programming solutions, V.Vaswani, TMH.

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MCA - I Year - II Sem.

OPERATIONS RESEARCH

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

Outcomes:

- Ability to understand the optimization methods and also learn where to use in computer programming.
- Ability to apply the OR methods in different domains like operating system, algorithms and etc.

UNIT I

Introduction to Operations Research: Basics definition, scope, objectives, phases, models and limitations of Operations Research. Linear Programming Problem – Formulation of LPP, Graphical solution of LPP. Simplex Method, Artificial variables, big-M method, two-phase method, degeneracy and unbound solutions.

UNIT II

Transportation Problem: Formulation, solution, unbalanced Transportation problem. Finding basic feasible solutions – Northwest corner rule, least cost method and Vogel's approximation method. Optimality test: the stepping stone method and MODI method.

Assignment model: Formulation. Hungarian method for optimal solution. Solving unbalanced problem. Traveling salesman problem as assignment problem.

UNIT III

Sequencing models: Solution of Sequencing Problem – Processing n Jobs through 2 Machines – Processing n Jobs through 3 Machines – Processing 2 Jobs through m machines – Processing n Jobs through m Machines.

Replacement Models: Replacement of Items that Deteriorate whose maintenance costs increase with time without change in the money value. Replacement of items that fail suddenly: individual replacement policy, group replacement policy.

UNIT IV

Dynamic programming: Characteristics of dynamic programming. Dynamic programming approach for Priority Management employment smoothening, Stage Coach/Shortest Path and Reliability problems.

Games Theory: Competitive games, rectangular game, saddle point, minimax (maximin) method of optimal strategies, value of the game. Solution of games with saddle points, dominance principle. Rectangular games without saddle point – mixed strategy for 2 X 2 games.

UNIT V

Inventory models: Inventory costs. Models with deterministic demand – model (a) demand rate uniform and production rate infinite, model (b) demand rate non-uniform and production rate infinite, model (c) demand rate uniform and production rate finite.

Queuing Theory: Essential Features of a queuing system. Performance measures of a queuing system. Model 1: $\{(M/M/1) : (\infty/FCFS)\}$ Single server, Unlimited Queue model. Model 2: $\{(M/M/1) : (\infty/SIRO)\}$ Single server, Unlimited Queue model. Model III: $\{(M/M/1) : (N/FCFS)\}$ Single server, Finite Queue model.

TEXT BOOKS:

1. J K Sharma. "Operations Research Theory & Applications 4e", Macmillan India Ltd.
2. P. K. Gupta and D. S. Hira, "Operations Research", S. Chand & co., 2007.

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, 2nd edition, Wiley India.
11. W.L.Winston, Operations Research, 4th edition, Cengage Learning.
12. R. Panneerselvam, "Operations Research", PHI-2e, 2006, rp2008.
13. ANITHA H S, "Operations Research", EXEL books, 2011.

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MCA - I Year - II Sem.

SOFTWARE ENGINEERING

Objectives:

- Understanding of software process models such as waterfall and evolutionary models.
- Understanding of software requirements and SRS document.
- Understanding of different software architectural styles.
- Understanding of software testing approaches such as unit testing and integration testing.
- Understanding on quality control and how to ensure good quality software.

Outcomes:

- Ability to identify the minimum requirements for the development of application.
- Ability to develop, maintain, efficient, reliable and cost effective software solutions.
- Ability to think critically and evaluate assumptions and arguments.

UNIT I

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, legacy software, Software myths.

A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

Process models: The waterfall model, Incremental process models, Evolutionary process models, specialized process models, The Unified process.

UNIT II

Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

System models: Context Models, Behavioral models, Data models, Object models, structured methods.

UNIT III

Design Engineering: Design process and Design quality, Design concepts, the design model, pattern based software design.

Creating an architectural design: software architecture, Data design, Architectural styles and patterns, Architectural Design, assessing alternative architectural designs, mapping data flow into a software architecture.

Modeling component-level design: Designing class-based components, conducting component-level design, Object constraint language, designing conventional components.

Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

UNIT IV

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

Product metrics: Software Quality, Frame work for Product metrics, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

Metrics for Process and Products: Software Measurement, Metrics for software quality.

UNIT V

Risk management: Reactive Vs Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

TEXT BOOKS:

1. Software Engineering A practitioner's Approach, Roger S Pressman, sixth edition, McGraw Hill International Edition.
2. Software Engineering, Ian Sommerville, seventh edition, Pearson education.

REFERENCE BOOKS:

1. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.
2. Software Engineering : A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008.
3. Fundamentals of Software Engineering, Rajib Mall, PHI, 2005.
4. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
5. Software Engineering1: Abstraction and modeling, Diner Bjorner, Springer International edition, 2006.
6. Software Engineering2: Specification of systems and languages, Diner Bjorner, Springer International edition , 2006.
7. Software Engineering Foundations, Yingxu Wang, Auerbach Publications, 2008.
8. Software Engineering Principles and Practice, Hans Van Vliet, 3rd edition, John Wiley & Sons Ltd.
9. Software Engineering 3: Domains, Requirements, and Software Design, D.Bjorner, Springer International Edition.
10. Introduction to Software Engineering, R.J.Leach, CRC Press.

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DATA STRUCTURES LAB USING C++

List of Sample Problems:

1. Write a C++ program to perform the following operations :
 - a) Create a Singly linked list of elements.
 - b) Search for a given element in the above list.
 - c) Delete an element from the above Singly linked list.
 - d) Display the contents of the list.
2. Write a C++ program to perform the following operations:
 - a) Create a doubly linked list of elements.
 - b) Delete an element from the above doubly linked list
 - c) Display the contents of the list.
3. Write C++ programs to implement the following using an array.
 - a) Stack ADT b) Queue ADT
4. Write C++ programs to implement the following using a singly linked list.
 - a) Stack ADT b) Queue ADT
5. Write a C++ program to convert i) a given infix expression into postfix form using stack and ii) evaluate the Postfix expression using stack.
6. Write C++ programs to implement the deque (double ended queue) ADT using
 - a) Singly linked list b) Doubly linked list c) an array.
7. Write C++ programs that use recursive functions to traverse the given binary tree in
 - a) Preorder b) Inorder and c) Postorder
8. Write a C++ program to perform the following operations:
 - a) Construct a binary search tree of elements.
 - b) Search for a key element in the above binary search tree.
 - c) Delete an element from the above binary search tree.
9. Write C++ programs for implementing the following Searching methods:
 - a) Linear Search b) Binary Search
10. Write C++ programs for implementing the following sorting methods:
 - a) Bubble Sort b) Selection Sort c) Insertion Sort
11. Write C++ programs for implementing the following sorting methods:
 - a) Merge sort b) Quick sort c) Heap sort d) Radix sort.
12. Write a C++ program to perform the following operation:
 - a) Insertion into a B-tree
13. Write a C++ program to implement all the functions of a dictionary (ADT) using hashing.

14. Write a C++ program for implementing Knuth-Morris-Pratt pattern matching algorithm.
15. Write C++ programs that use non-recursive functions to traverse the given binary tree in
a) Preorder b) inorder and c) postorder.
16. Write C++ programs for the depth first and breadth first traversals of a graph.

(Note: You may use STL(Standard Template Library) in writing the above programs)

TEXT BOOKS :

1. Data Structures A Pseudocode Approach with C++, India Edition, R.F.Gilberg and B.A.Forouzan, Cengage Learning.
2. Data structures with C++, J.R.Hubbard, Schaum's Outlines, TMH.
3. Data Structures and STL, W.J.Collins, Mc Graw Hill, International edition.
4. Data structures and Algorithms with OODesign patterns in C++, B.R.Priess, John Wiley & sons.
5. Advanced Data structures & Algorithms in C++, V.V.Muniswamy, Jaico Publishing House.
6. C++ for Programmers, P.J.Deitel and H.M.Deitel, Pearson/C++: How to Program, Deitel and Dietel, PHI.
7. Data structures via C++, A.M.Berman, Oxford University Press.

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SOFTWARE ENGINEERING LAB

Objectives:

- To have hands on experience on dealing with a software project development activity by using various software Engineering principles and methods.
- At the end of the course the student shall have clear idea about Software Engineering and will be in a position to do all the phases of a software project development individually for small projects.

LIST OF EXPERIMENTS

Do the following 8 exercises for any two projects given in sample projects or any other projects:

1. Development of problem statement.
2. Preparation of Software Requirement Specification Document, Design Documents and Testing Phase related documents.
4. Preparation of Software Configuration Management and Risk Management related documents.
5. Study and usage of any Design phase CASE tool
6. Performing the Design by using any Design phase CASE tools.
7. Develop test cases for unit testing and integration testing
8. Develop test cases for various white box and black box testing techniques.

Sample Projects:

1. Passport automation System
2. Book Bank
3. Online Exam Registration
4. Stock Maintenance System
5. Online course reservation system
6. E-ticketing
7. Software Personnel Management System
8. Credit Card Processing
9. E-book management System.
10. Recruitment system.

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ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

The **Language Lab** focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts.

Objectives:

- ✎ To facilitate computer-aided multi-media instruction enabling individualized and independent language learning
- ✎ To sensitize the students to the nuances of English speech sounds, word accent, intonation and rhythm
- ✎ To bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking
- ✎ To improve the fluency in spoken English and neutralize mother tongue influence
- ✎ To train students to use language appropriately for interviews, group discussion and public speaking

Syllabus: English Language Communication Skills Lab shall have two parts:

- a. **Computer Assisted Language Learning (CALL) Lab**
- b. **Interactive Communication Skills (ICS) Lab**

The following course content is prescribed for the **English Language Communication Skills Lab**

Exercise – I

CALL Lab: Introduction to Phonetics – Speech Sounds – Vowels and Consonants

ICS Lab: Ice-Breaking activity and JAM session

Articles, Prepositions, Word formation- Prefixes & Suffixes, Synonyms & Antonyms

Exercise – II

CALL Lab: Structure of Syllables - Past Tense Marker and Plural Marker – Weak Forms and Strong Forms - Consonant Clusters.

ICS Lab: Situational Dialogues – Role-Play- Expressions in Various Situations – Self-introduction and Introducing Others – Greetings – Apologies – Requests – Social and Professional Etiquette - Telephone Etiquette.

Concord (Subject in agreement with verb) and Words often misspelt- confused/misused

Exercise - III

CALL Lab: Minimal Pairs- Word accent and Stress Shifts- Listening Comprehension.

ICS Lab: Descriptions- Narrations- Giving Directions and guidelines.

Sequence of Tenses, Question Tags and One word substitutes.

Exercise – IV

CALL Lab: Intonation and Common errors in Pronunciation.

ICS Lab: Extempore- Public Speaking

Active and Passive Voice, –Common Errors in English, Idioms and Phrases

Exercise – V

CALL Lab: Neutralization of Mother Tongue Influence and Conversation Practice

ICS Lab: Information Transfer- Oral Presentation Skills

Reading Comprehension and Job Application with Resume preparation.

Minimum Requirement of infra structural facilities for ELCS Lab:

1. **Computer Assisted Language Learning (CALL) Lab:**

The Computer aided Language Lab for 40 students with 40 systems, one master console, LAN facility and English language software for self- study by learners.

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

2. Interactive Communication Skills (ICS) Lab :

The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V., a digital stereo –audio & video system and camcorder etc.

Prescribed Lab Manual: A Manual entitled “**English Language Communication Skills (ELCS) Lab Manual- cum- Work Book**”, published by Cengage Learning India Pvt. Ltd, New Delhi. 2013.

Suggested Software:

- ❖ **Cambridge Advanced Learners’ English Dictionary with CD.**
- ❖ **Grammar Made Easy by Darling Kindersley**
- ❖ **Punctuation Made Easy by Darling Kindersley**
- ❖ Clarity Pronunciation Power – Part I
- ❖ Clarity Pronunciation Power – part II
- ❖ **Oxford Advanced Learner’s Compass, 7th Edition**
- ❖ **DELTA’s key to the Next Generation TOEFL Test: Advanced Skill Practice.**
- ❖ Lingua TOEFL CBT Insider, by Dreamtech
- ❖ TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- ❖ **English in Mind (Series 1-4), Herbert Puchta and Jeff Stranks with Meredith Levy,**
Cambridge
- ❖ English Pronunciation in Use, Cambridge University Press
- ❖ Technical Communication, OUP
- ❖ Communication Skills, OUP

SUGGESTED READING:

1. Rama Krishna Rao, A. *et al. English Language Communication Skills – A Reader cum Lab Manual Course Content and Practice.* Chennai: Anuradha Publishers
2. Suresh Kumar, E. & Sreehari, P. 2009. *A Handbook for English Language Laboratories.* New Delhi: Foundation
3. *Speaking English Effectively* 2nd Edition by Krishna Mohan and N. P. Singh, 2011. Macmillan Publishers India Ltd. Delhi.
4. Sasi Kumar, V & Dhamija, P.V. *How to Prepare for Group Discussion and Interviews.* Tata McGraw Hill
5. Hancock, M. 2009. *English Pronunciation in Use. Intermediate.* Cambridge: CUP
6. Spoken English: A Manual of Speech and Phonetics by R. K. Bansal & J. B. Harrison. 2013. Orient Blackswan. Hyderabad.
7. Hewings, M. 2009. *English Pronunciation in Use. Advanced.* Cambridge: CUP
8. Marks, J. 2009. *English Pronunciation in Use. Elementary.* Cambridge: CUP
9. Nambiar, K.C. 2011. *Speaking Accurately. A Course in International Communication.* New Delhi : Foundation
10. Soundararaj, Francis. 2012. *Basics of Communication in English.* New Delhi: Macmillan
11. **Spoken English** (CIEFL) in 3 volumes with 6 cassettes, OUP.
12. **English Pronouncing Dictionary** Daniel Jones Current Edition with CD.
13. **A text book of English Phonetics for Indian Students** by T.Balasubramanian (Macmillan)