

**DR. A.P.J. ABDUL KALAM TECHNICAL
UNIVERSITY LUCKNOW**



Study & Evaluation Scheme with Syllabus

for

Second Year MCA (Integrated)

On

Choice Based Credit System

(Effective from the Session: 2018-19)

MCA (INTEGRATED) SECOND YEAR, 2018-19

SEMESTER- III

S. No.	Subject Code	Subject Name	L-T-P	ESE Marks	Sessional		Total	Credit
					CT	TA		
1.	RCAI-301	Object Oriented Programming in C++	3-1-0	70	20	10	100	4
2.	RCAI-302	Introduction to Web Designing	3-1-0	70	20	10	100	4
3.	RCAI-303	Accounting and financial Management	3-1-0	70	20	10	100	4
4.	RCAI-304	Information Systems	3-1-0	70	20	10	100	4
5.	RAS-307	Applied Linear Algebra	3-1-0	70	20	10	100	4
6.	RCAI-351	Object Oriented Programming in C Lab	0-0-3	50	30	20	100	2
7.	RCAI-352	Introduction to Web Designing Lab	0-0-3	50	30	20	100	2
		Total					700	24

CT: Class Test

TA: Teacher Assessment

L/T/P: Lecture/ Tutorial/ Practical

SEMESTER-IV

S. No.	Subject Code	Subject Name	L-T-P	ESE Marks	Sessional		Total	Credit
					CT	TA		
1.	RCAI-401	Computer Based Statistical Techniques	3-1-0	70	20	10	100	4
2.	RCAI-402	Data Structures using C	3-1-0	70	20	10	100	4
3.	RCAI-403	Fundamentals of E-Commerce	3-1-0	70	20	10	100	4
4.	RCAI-404	Principles of Management	3-1-0	70	20	10	100	4
5.	RCAI-405	Operating Systems	3-1-0	70	20	10	100	4
6.	RCAI-451	Computer Based Statistical Techniques Lab	0-0-3	50	30	20	100	2
7.	RCAI-452	Data structures using C lab	0-0-3	50	30	20	100	2
		Total					700	24

CT: Class Test

TA: Teacher Assessment

L/T/P: Lecture/ Tutorial/ Practical

RCAI-301 OBJECTORIENTEDPROGRAMMING USING C++

UNIT-I

Introduction: Introducing Object – Oriented Approach, Relating to other paradigms {Functional, Data decomposition}.

Basic concepts: Abstraction, Encapsulation, Inheritance, Polymorphism, Review of C, Difference between C and C++ - cin, cout, new, delete, operators.

UNIT-II

Classes and Objects: Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, State identity and behavior of an object, Constructors and destructors, instantiation of objects, Default parameter value, object types, C++ garbage collection, dynamic memory allocation, Meta class / abstract classes.

UNIT-III

Inheritance and Polymorphism: Inheritance, Class hierarchy, derivation – public, private & protected, Aggregation, composition vs classification hierarchies, Polymorphism, Categorization of polymorphism techniques, Method polymorphism, Polymorphism by parameter, Operator overloading, Parametric Polymorphism

UNIT-IV

Generic function: Template function, function name overloading, overriding inheritance methods, Run time polymorphism, Multiple Inheritance.

UNIT-V

Files and Exception Handling: Streams and files, Namespaces, Exception handling, Generic Classes

References:

1. A.R. Venugopal, Rajkumar, T. Ravishanker “Mastering C++”, TMH, 1997.
- 2.S.B. Lippman & J.Lajoie, “ C++ Primer”, 3rd Edition, Addison Wesley, 2000.The C programming Lang., Person Ecl – Dennis Ritchie
3. R.Lafore, “Object Oriented Programming using C++”, Galgotia Publications, 2004.
4. E. Balagurusamy, “Object Oriented Programming with C++”, TMH
5. R.S. Salaria, Mastering Object-Oriented Programming with C++, Khanna Publishing House
6. Herbert Sehlid, “The Complete Reference C++”, TMH.
7. Schaum's Outline, Programming with C++, TMH.

Online Course:

[Course on C and CPP \(Spoken Tutorial MOOC\)](#)

RCAI-302 INTRODUCTIONS TO WEB DESIGNING

UNIT I

Networking Concepts: Network, Importance of Network - Parts of the Network, Types of Network, Network Topology, Protocols, Types of protocols, Methods used for transmission Network Cables.

UNIT II

Internet: Introduction - Brief history of Internet, Working of Internet, Applications of Internet: Application in Business sector, Application in Education sector - Requirements for Internet - using Internet - Popular terms of Internet - How to open Internet Explorer - Parts of Internet Explorer.

UNIT III

Introduction to HTML: What is HTML? - Evolution of HTML - Features of HTML - Filenames in HTML - Tools required - What are Tags? - Types of tags - Attributes - Comments - Structures of HTML tag - Rules for writing a HTML program - starting a HTML document: How to open Notepad - How to open HTML page - Editing the HTML program.

UNIT IV

Formatting in HTML: Introduction - Formatting tags -
 tag, <p> tag, <HR> tag – Text Formatting tags: tag, <I> tag, <U> tag, <BIG> tag, <SMALL> tag - The <BODY> tag : Background, Bgcolor, Link, Text attributes - The Heading tag - The <marquee> tag. The tag : color, face, size attributes - The tag : Alt, Align, Height and width Attributes, Border attributes - Anchor tag : Creating links in HTML - Lists : Types of Lists - Table: Table - Table size- Alignment and Spacing - Frames in HTML - Attributes of <FRAMESET> tag - <FRAME> tag.

UNIT V

Introduction to DHTML and CSS. XML: Introduction, transition from HTML to XML, DTD, XML schemas, building blocks of XML document, creating elements, creating attributes, creating entities.

References:

1. Ivan Baryons, "Web Enabled Commercial Application Development using. HTML, DHTML, JavaScript, Perl, CGI", BPB.
2. Scott Robert Ladd, "Dynamic HTML complete", McGraw-Hill.
3. David Busch, "Cascading Style Sheets complete", McGraw-Hill.
4. A Navarro, "Mastering XML", BPB

RCA-303 ACCOUNTING AND FINANCIAL MANAGEMENT

UNIT I:

Overview: Accounting concepts, conventions and principles; Accounting Equation, International Accounting principles and standards; Matching of Indian Accounting Standards with International Accounting Standards

UNIT II:

Mechanics of Double entry system of accounting, journalizing of transactions preparation of final accounts, Trading Account, Manufacturing Accounts, Profit & Loss Account, Profit & Loss Appropriation account and Balance Sheet, Policies related with depreciation, inventory and intangible assets like copyright, trademark, patents and goodwill.

UNIT III

Analysis of financial statement: Ratio Analysis- solvency ratios, profitability ratios, activity ratios, liquidity ratios, market capitalization ratios; Common Size Statement; Comparative Balance Sheet and Trend Analysis of manufacturing, service & banking organizations.

UNIT IV

Funds Flow Statement: Meaning, Concept of Gross and Net Working Capital, Preparation of Schedule of Changes in Working Capital, Preparation of Funds Flow Statement and its analysis; Cash Flow Statement: Various cash and non-cash transactions, flow of cash, preparation of Cash Flow Statement and its analysis.

References;

1. Narayanswami - Financial Accounting: A Managerial Perspective (PHI, 2nd Edition)
2. Mukherjee - Financial Accounting for Management (TMH, 1st Edition)
3. Ramchandran & Kakani - Financial Accounting for Management (TMH, 2nd Edition)
4. Ghosh T P - Accounting and Finance for Managers (Taxman, 1st Edition).
5. Maheshwari S.N & Maheshwari S K – An Introduction to Accountancy (Vikas, 9th Edition)
6. Ashish K. Bhattacharya- Essentials of Financial Accounting (PHI, New Delhi)
7. Ghost T.P- Financial Accounting for Managers (Taxman, 3rd Edition)
8. Maheshwari S.N & Maheshwari S K – A text book of Accounting for Management (Vikas, 1st Edition)

RCAI-304 INFORMATION SYSTEMS

UNIT I

Foundation of Information Systems: Introduction to information system in business, fundamentals of information systems, solving business problems with information systems, Types of information systems, Effectiveness and efficiency criteria in information system.

UNIT II

An overview of Management Information Systems: Definition of a management information system, MIS versus Data processing, MIS & Decision Support Systems, Concept of an MIS, Structure of a Management information system.

UNIT III

Concepts of planning & control: Concept of organizational planning, The Planning Process, Computational support for planning, Characteristics of control process, The nature of control in an organization.

UNIT IV

Business applications of information technology: Internet & electronic commerce, Intranet, Extranet & Enterprise Solutions, Information System for Business Operations, Information System for Managerial Decision Support, Information System for Strategic Advantage.

UNIT V

Managing Information Technology: Enterprise & global management, Security & Ethical challenges, Planning & Implementing changes, CRM, SCM.

References:

1. O Brian, "Management Information System", TMH
2. Gordon B. Davis & Margrethe H. Olson, "Management Information System", TMH.
3. O Brian, "Introduction to Information System", MCGRAW HILL.
4. Murdick, "Information System for Modern Management", PHI.
5. Jawadekar, "Management Information System", TMH.
6. Jain Sarika, "Information System", PPM
7. Davis, "Information System", Palgrave Macmillan

RAS-307 APPLIED LINEAR ALGEBRA

UNIT-1

Fields, Vector-spaces, sub-spaces, linear-combination, linear-dependence and independence. Basis, dimensions and coordinates (each and every fact to be illustrated by suitable examples).

UNIT II:

Linear-transformation, definition and examples, matrix representation, similarity, range and kernel, and-nullity theorem and its consequences.

UNIT III:

Singular and non-singular linear transformations, sum and product of linear transformations, vector space of linear transformations, nilpotent linear transformations.

UNIT IV:

Inner product spaces, definition and examples, orthogonality, Cauchy-Schwartz Inequality, inkowski Inequality, polarization Identity, complete orthonormal set, Bessel's Inequality, Gram-Schmidt's orthogonalization process.

UNIT V:

Linear functional, definition and examples, vector space of linear functional, dual vector spaces, adjoint, self adjoint, Unitary and normal operators, examples and properties, eigen values and eigen vectors, diagonalisation of linear operators, quadratic forms, principle axis theorem (without proof), some applications to engineering problems.

References:

1. Dym, H. Linear Algebra in action, University Press.2012
2. Halmos, P.R.: Finite Dimensional Vector Spaces (1990) Narosa.
3. Hoffman, K. and Kunze, R.: Linear Algebra PHI (2012)
4. Kolman, B. And Hill, D.R.: Introductory linear algebra with applications (2008) Pearson
5. Lipschutz, S. and Lipson M.: Linear Algebra (2005) Schaum's Series.
6. Noble, B. And Daniel, J.W.: Applied linear algebra. (1988) PHI

RCAI-351 OBJECT ORIENTED PROGRAMMING LAB

LIST OF EXPERIMENTS C++

- program using functions
- functions with default arguments
- implementation of call by value, address, reference
- simple classes for understanding objects, member functions & constructors
- classes with primitive data members,
- classes with arrays as data members
- classes with pointers as data members
- classes with constant data members
- classes with static member functions
- compile time polymorphism
- operator overloading
- function overloading
- run time polymorphism
- inheritance
- virtual functions
- virtual base classes
- templates
- file handling
- sequential access
- random access

RCAI-352 INTRODUCTION TO WEB DESIGNING LAB

LIST OF EXPERIMENTS

- Practice Tags and basic structure of HTML files.
- Develop the concept of basic and advanced text formatting.
- Practice the use of multimedia components in HTML documents.
- Designing of webpage-Document Layout, Working with List, Working with Tables.
- Practice Hyper linking, Designing of webpage-Working with Frames, Forms and Controls.
- Prepare creating style sheet, CSS properties, Background, Text, Font and styling etc.
- Working with List, HTML elements box, Positioning and Block properties in CSS.
- Designing with cascading style sheet-Internal and External style sheet.

RCAI-401 COMPUTERS BASED NUMERICAL AND STATISTICAL TECHNIQUES

UNIT-I

Floating point Arithmetic: Representation of floating point numbers, Operations, Normalization, Pitfalls of floating point representation. Errors in numerical computation. **Iterative Methods:** Zeros of a single transcendental equation and zeros of polynomial using Bisection Method, Iteration Method, Regula-Falsi method, Newton Raphson method, Secant method, Rate of convergence of iterative methods.

UNIT-II

Finite differences and Interpolation: Finite Differences, Difference tables. Polynomial Interpolation: Newton's forward and backward formula Central Difference Formulae: Gauss forward and backward formula, Sterling's, Bessel's, Everett's formula. Lagrange's Interpolation, Newton Divided difference formula, Hermit's Interpolation for unequal intervals.

UNIT-III

Numerical Differentiation and Integration: Introduction, Numerical Differentiation, Numerical Integration, Trapezoidal rule, Simpson's rules, Boole's Rule, Weddle's Rule Euler-Maclaurin Formula.

UNIT-IV

Simultaneous Linear Equations: Solutions of system of Linear equations, Gauss Elimination direct method and pivoting, Ill Conditioned system of equations, Refinement of solution. Gauss Jacobi and Gauss Seidel iterative methods, Rate of Convergence.

Solution of differential equations: Picard's Method, Euler's Method, Taylor's Method, Runge-Kutta methods, Predictor-corrector methods.

UNIT-V

Curve fitting, Approximations and Regression Analysis: Method of least squares, fitting of straight lines, polynomials, exponential curves etc. Approximation of functions by Chebyshev polynomials. Linear, Non-linear and Multiple regressions.

Statistical methods: Sample distributions, Test of Significance: Chi-Square Test, t and F test.

References:

1. Rajaraman V., "Computer Oriented Numerical Methods", PHI
2. Gerald & Wheatley, "Applied Numerical Analyses", AW
3. Jain, Iyengar and Jain, "Numerical Methods for Scientific and Engineering Computations", New Age Int.
4. Gupta S.P. and Kapoor, V.K., Fundamentals of Applied statistics, Sultan Chand & Sons.
5. R. S. Salaria, Computer Oriented Numerical Methods, Khanna Publishing House
6. Gupta S.P. and Kapoor, V.K., Fundamentals of Mathematical Statistics, Sultan Chand and Sons.

RCAI-402 DATA STRUCTURES USING C

UNIT I:

Introduction: Basic Terminology, Elementary Data Organization, Data Structure operations, Algorithm Complexity and Time-Space trade-off Arrays: Array Definition, Representation and Analysis, Single and Multidimensional Arrays, address calculation, application of arrays, Character String in C, Character string operation, Array as Parameters, Ordered List, Sparse Matrices, and Vectors. Stacks: Array Representation and Implementation of stack, Operations on Stacks: Push & Pop, Array Representation of Stack, Linked Representation of Stack, Operations Associated with Stacks, Application of stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack. Recursion: Recursive definition and processes, recursion in C, example of recursion, Tower of Hanoi Problem, simulating recursion. Backtracking, recursive algorithms, principles of recursion, tail recursion, removal of recursion.

UNIT II:

Queues: Array and linked representation and implementation of queues, Operations on Queue: Create, Add, Delete, Full and Empty. Circular queue, Deque, and Priority Queue, Linked list: Representation and Implementation of Singly Linked Lists, Two-way Header List, Traversing and Searching of Linked List, Overflow and Underflow, Insertion and deletion to/from Linked Lists, Insertion and deletion Algorithms, doubly linked list, Linked List in Array, Polynomial representation and addition, Generalized linked list, Garbage Collection and Compaction.

UNIT III:

Trees: Basic terminology, Binary Trees, Binary tree representation, algebraic Expressions, Complete Binary Tree. Extended Binary Trees, Array and Linked Representation of Binary trees, Traversing Binary trees, Threaded Binary trees. Traversing Threaded Binary trees, Huffman algorithm. Searching and Hashing: Sequential search, binary search, comparison and analysis, Hash Table, Hash Functions, Collision Resolution Strategies, Hash Table Implementation.

UNIT IV:

Sorting: Insertion Sort, Bubble Sorting, Quick Sort, Two Way Merge Sort, Heap Sort, Sorting on Different Keys, Practical consideration for Internal Sorting. Binary Search Trees: Binary Search Tree (BST), Insertion and Deletion in BST, Complexity of Search Algorithm, Path Length, AVL Trees, B-trees.

UNIT V:

Graphs: Terminology & Representations, Graphs & Multi-graphs, Directed Graphs, Sequential Representations of Graphs, Adjacency Matrices, Traversal, Connected Component and Spanning Trees, Minimum Cost Spanning Trees. File Structures: Physical Storage Media File Organization, Organization of records into Blocks, Sequential Files, Indexing and Hashing, Primary indices, Secondary indices, B+ Tree index Files, B Tree index Files, Indexing and Hashing Comparisons.

References:

1. Y. Langsam, M. Augenstein and A. Tannenbaum, Data Structures using C and C++, Pearson Education Asia, 2nd Edition, 2002.
2. Ellis Horowitz, S. Sahni, D. Mehta Fundamentals of Data Structures in C++, Golgotha Book Source, New Delhi.
3. S. Lipchitz, Data Structures Mc-Graw Hill International Editions, 1986.
4. Jean-Paul Tremblay, Paul. G. Sores an, An introduction to data structures with Applications, Tata Mc-Graw Hill International Editions, 2nd edition 1984.
5. R. S. Salaria, Data Structures, Khanna Publishing House
6. A. Michael Berman, Data structures via C++, Oxford University Press, 2002.
7. M. Weiss, Data Structures and Algorithm Analysis in C++, Pearson Education, 2002, 2nd edition.
8. R. B. Patel, Expert Data Structures with C, Khanna Publishing House

Online Course

MOOC on Algorithms and Data Structures (IIT Bombay)

RCAI-403 FUNDAMENTALS OF E-COMMERCE

UNIT I

Introduction: Electronic Commerce - Technology and Prospects, Definition of E- Commerce, Economic potential of electronic commerce, Incentives for engaging in electronic commerce, forces behind E -Commerce, Advantages and Disadvantages, Architectural framework, Impact of E-commerce on business.

UNIT II

Mobile Commerce: Introduction, Wireless Application Protocol, WAP technology, Mobile Information device, Mobile Computing Applications.

UNIT III

Web Security: Security Issues on web, Importance of Firewall, components of Firewall, Transaction security, Emerging client server, Security Threats, Network Security.

UNIT IV

Encryption: Encryption techniques, Symmetric Encryption- Keys and data encryption standard, Asymmetric encryption- Secret key encryption, public and private pair key encryption, Digital Signatures, Virtual Private Network.

UNIT V

Electronic Payments: Overview, The SET protocol, Payment Gateway, certificate, digital Tokens, Smart card, credit card, magnetic strip card, E-Checks, Credit/Debit card based EPS, online Banking. EDI Application in business, E- Commerce Law, Forms of Agreement, Govt. policies and Agenda.

References:

1. Ravi Kalakota, Andrew Winston, "Frontiers of Electronic Commerce", Addison Wesley.
2. Bajaj and Nag, "E-Commerce the cutting edge of Business", TMH
3. P. Loshin, John Vacca, "Electronic commerce", Firewall Media, New Delhi

RCAI-404 PRINCIPLES OF MANAGEMENT

UNIT I:

Management: Concept, Nature, Importance; Management: Art and Science, Management As a Profession, Management Vs. Administration, Management Skills, Levels of Management, And Characteristics of Quality Managers. Evolution of Management: Early contributions, Taylor and Scientific Management, Fayol's Administrative Management, Bureaucracy, Hawthorne Experiments and Human Relations, Social System Approach, Decision Theory Approach. Business Ethics and Social Responsibility: Concept, Shift to Ethics, Tools of Ethics.

UNIT II:

Introduction to Functions of Management Planning: Nature, Scope, Objectives and Significance of Planning, Types of Planning, Process of Planning, Barriers to Effective Planning, Planning Premises and Forecasting, Key to Planning, Decision Making. Organizing: Concept, Organization Theories, Forms of Organizational Structure, Combining Jobs: Departmentation, Span of Control, Delegation of Authority, Authority & Responsibility and Organizational Design.

UNIT III:

Staffing: Concept, System Approach, Manpower Planning, Job Design, Recruitment & Selection, Training & Development, Performance Appraisal Directing: Concept, Direction and Supervision Motivation: Concept, Motivation and Performance, Theories of Motivation, Approaches for Improving Motivation, Pay and Job Performance, Quality of Work Life, Morale Building.

UNIT IV:

Leadership: The Core of Leadership: Influence, Functions of Leaders, Leadership Style, And Leadership Development. Communication: Communication Process, Importance of Communication, Communication Channels, Barriers to Communication. Controlling: Concept, Types of Control, Methods: Pre-control: Concurrent Control: Post-control, An Integrated Control System, The Quality Concept Factors affecting Quality, Developing a Quality Control System, Total Quality Control, Pre-control of Inputs, Concurrent Control of Operations. Post Control of Outputs. Change and Development: Model for Managing Change, Forces for Change, Need for Change, Alternative Change Techniques, New Trends in Organizational Change.

References:

1. Stoner, Freeman & Gilbert Jr-Management (Prentice Hall of India, 6th Edition).
2. Koontz -Principles of Management (Tata Mc Graw Hill, 1st Edition 2008).
3. Robbins & Coulter - Management (Prentice Hall of India, 8th Edition).
4. Robbins S.P. and Decenzo David A. - Fundamentals of Management: Essential Concepts and Applications (Pearson Education, 5th Edition).
5. Hillier Frederick S. and Hillier Mark S. - Introduction to Management Science: A
6. Modeling and Case Studies Approach with Spreadsheets (Tata Mc Graw Hill, 2nd Edition 2008).
7. Weihrich Heinz and Koontz Harold - Management: A Global and Entrepreneurial Perspective (Mc Graw Hill, 12th Edition 2008).

RCAI-405 OPERATING SYSTEMS

UNIT-I

Operating system concepts: OS definition and services; Types and features: batch systems, multiprogramming, multitasking, parallel systems, distributed systems, real-time systems, time-sharing systems, PC systems; System Calls types, System Programs

UNIT II

Process vs. Thread: process states, process control block; Inter process communication; Process Synchronization: Classical problems of synchronization; CPU Scheduling: Criteria; Algorithms: FCFS, SJF, Priority, Round- Critical section problem and solution criteria, Semaphores Robin, Real-time.

UNIT III

Memory Management: Paging and Segmentation approaches, virtual memory, Demand Paging and Page Replacement algorithms; Deadlocks: necessary conditions, prevention, avoidance and recovery, banker's algorithm.

UNIT IV

File management: File system Structure, allocation methods: Contiguous allocation, Linked allocation, indexed allocation free space management: Bit vector, linked list, grouping, counting; Directory implementation: Linear List, Hash table. Device Management: Disk structure, Disk scheduling: Selecting Disk Scheduling algorithm.

UNIT V

UNIX: Essential commands and utilities, Unix files, directory structure, file security, pipe, filter, Bourne shell programming features, systems calls classification and basics (reg. file manipulation, process, signal and IPC); Linux: System components, Process management, scheduling, memory management, Networking software layers, Security, various editors, I/O devices, IPC.

References:

1. Operating System Concepts by Silberschatz and Galvin; Addison Wesley
2. Distributed Operating Systems by Andrew S. Tannenbaum; Pearson Education
3. UNIX Concepts and Applications by Sumitabha Das; Tata MC-Graw Hill
4. Ekta Walia, Khanna Publishing House, Operating System Concepts

RCAI-451 COMPUTER BASED NUMERICAL AND STATSTICAL TECHNIQUES LAB

LIST OF EXPERIMENTS IN C:

- To implement floating point arithmetic operations i.e., addition, subtraction, multiplication and division.
- To deduce errors involved in polynomial interpolation.
- Algebraic and transcendental equations using Bisection, Newton Raphson,
- Iterative, method of false position, rate of conversions of roots in tabular form for each of these methods.
- To implement formulae by Bessel, Newton, Stirling, Lagrange's etc.
- To implement method of least square curve fitting.
- Implement numerical differentiation.
- Implement numerical integration using Simpson's 1/3 and 3/8 rules, trapezoidal rule.
- To show frequency chart, regression analysis, Linear square fit, and polynomial fit.
- NOTE- Institutions are required to add four more experiments as per available expertise with them

RCAI-452 DATA STRUCTURES USING 'C' LAB

LIST OF EXPERIMENTS IN C:

- Sorting programs: Bubble sort, Merge sort, Insertion sort, Selection sort, and Quick sort.
- Searching programs: Linear Search, Binary Search.
- Array implementation of Stack, Queue, Circular Queue, Linked List.
- Implementation of Stack, Queue, Circular Queue, Linked List using dynamic memory allocation.
- Implementation of Binary tree.
- Program for Tree Traversals (preorder, in order, post order).
- Program for graph traversal (BFS, DFS).
- Program for minimum cost spanning tree, shortest path.