B.Tech. IT (5th SEMESTER)

Course		Contact Hrs.			Marks			Credits
Code	**Name**	**L**	**T**	**P**	**Int.**	**Ext.**	**Total**	
BITES1-501	Database Management System	3	0	0	40	60	100	3
BITES1-502	Design and Analysis of Algorithms	3	1	0	40	60	100	4
BITES1-503	Web Technologies	3	0	0	40	60	100	3
BITES1-504	System Analysis and Design	3	0	0	40	60	100	3
BITES1-505	Database Management System Laboratory	0	0	2	60	40	100	1
BITES1-506	Design and Analysis of Algorithms Laboratory	0	0	2	60	40	100	1
BITES1-507	Training-II*	-	-	-	60	40	100	4
	Departmental Elective-I (choose one)	3	0	0	40	60	100	3
BITED1-511	Computer Graphics							
BITED1-512	Graphics and Multimedia systems							
BITED1-513	Formal Language and Automata Theory							
BITED1-514	Signals and Systems							
BHSMC0-015	Finance and Accounting	3	0	0	40	60	100	3
Total 6 Theory & 2 Lab. Courses		**18**	**1**	**4**	**440**	**460**	**900**	**25**

*****During the summer vacation after 4th Sem

DATABASE MANAGEMENT SYSTEM

Subject Code- BITES1- 501 **L T P C** **Duration – 45 hrs.**

3 0 0 3

COURSE OBJECTIVE

This course will help student to understand the concepts used in database management systems. They will also help to create database using DDL and DML. They will learn to implement database security and various advanced topics will also be covered.

COURSE OUTCOMES

1. To be able to learn different DBMS languages and data models.
2. For a given specification construct the SQL queries for Open source and Commercial DBMS -MYSQL, ORACLE, and DB2.
3. For a given transaction-processing system, determine the transaction atomicity, consistency, isolation, and durability.
4. Implement database security.

COURSE CONTENTS

UNIT I (11 Hrs)

Database system architecture: introduction, Data Abstraction, Data Independence, Data Definition Language (DDL), Data Manipulation Language (DML).

Data models: Entity-relationship model, network model, relational and object-oriented data models, integrity constraints.

UNIT II (11 Hrs)

Relational query languages: Relational algebra, Tuple and domain relational calculus, SQL3, DDL and DML constructs, introduction to MYSQL, ORACLE, DB2, SQL server.

Relational database design: Domain and data dependency, Normal forms, Dependency preservation, Lossless design.

UNIT III (12 Hrs)

Query processing and optimization: Evaluation of relational algebra expressions, Query equivalence, Join strategies, Query optimization algorithms.

Transaction processing: Concurrency control, ACID property, Serializability of scheduling, Locking and timestamp based schedulers, Multi-version and optimistic Concurrency Control schemes.

UNIT IV (11 Hrs)

Database recovery: Introduction, log based recovery, shadow page recovery.

Database Security: Authentication, Authorization and access control, DAC, MAC and RBAC models, introduction to SQL injection.

Advanced topics: Introduction to Object oriented, Distributed databases.

RECOMMENDED BOOKS

1. "Database System Concepts", 6th Edition by Abraham Silberschatz, Henry F.Korth, S. Sudarshan, McGraw-Hill.
2. "Principles of Database and Knowledge – Base Systems", Vol 1 by J. D. Ullman, Computer Science Press.
3. "Fundamentals of Database Systems", 5th Edition by R. Elmasri and S. Navathe, Pearson Education.

4. "Foundations of Databases", Reprint by Serge Abiteboul, Richard Hull, Victor Vianu, Addison-Wesley

DESIGN AND ANALYSIS OF ALGORITHMS

Subject Code- BITES1-502 **L T P C** **Duration – 60 hrs.**

3 1 0 4

COURSE OBJECTIVE

1. Analyze the asymptotic performance of algorithms.
2. Write rigorous correctness proofs for algorithms.
3. Demonstrate a familiarity with major algorithms and data structures.
4. Apply important algorithmic design paradigms and methods of analysis.
5. Synthesize efficient algorithms in common engineering design situations.

COURSE OUTCOMES

1. For a given algorithms analyze worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms.
2. Describe greedy paradigm and explain when an algorithmic design situation calls for it.
3. Describe the different graph and tree traversal algorithms.
4. Describe the computability of problem using Cook's theorem.

COURSE CONTENTS

UNIT I (15 Hrs)

Introduction: Characteristics of algorithm. Analysis of algorithm: Asymptotic analysis of complexity bounds – best, average and worst-case behaviour; Performance measurements of Algorithm, Time and space trade-offs, Analysis of recursive algorithms through recurrence relations: Substitution method, Recursion tree method and Masters' theorem.

UNIT II (15 Hrs)

Fundamental Algorithmic Strategies: Brute-Force, Greedy, Dynamic Programming, Branch and Bound and Backtracking methodologies for the design of algorithms; Illustrations of these techniques for Problem-Solving, Bin Packing, Knap Sack TSP. Heuristics –characteristics and their application domains.

UNIT III (15 Hrs)

Graph and Tree Algorithms: Traversal algorithms: Depth First Search (DFS) and Breadth First Search (BFS); Shortest path algorithms, Transitive closure, Minimum Spanning Tree, Topological sorting, Network Flow Algorithm.

UNIT IV (15 Hrs)

Tractable and Intractable Problems: Computability of Algorithms, Computability classes – P, NP, NP-complete and NP-hard. Cook's theorem, Standard NP-complete problems, and Reduction techniques. Introduction to recent advancements in design and analysis of algorithms.

RECOMMENDED BOOKS

1. Introduction to Algorithms, 4TH Edition, Thomas H Cormen, Charles E Lieserson, Ronald L Rivest and Clifford Stein, MIT Press/McGraw-Hill.
2. Fundamentals of Algorithms – E. Horowitz et al.
3. Algorithm Design, 1ST Edition, Jon Kleinberg and ÉvaTardos, Pearson.

4. Algorithm Design: Foundations, Analysis, and Internet Examples, Second Edition, Michael T Goodrich and Roberto Tamassia, Wiley.
5. Algorithms-A creative approach, 3rd Edition, UdiManber, Addison-Wesley,Reading, MA.

WEB TECHNOLOGIES

Subject Code- BITES1-503 **L T P C** **Duration – 45 hrs.**
3 0 0 3

COURSE OBJECTIVE

1. Familiar with client server architecture.
2. Able to develop a web application using java technologies.
3. Students will gain the skills and project-based experience needed for entry into web application and development careers.

COURSE OUTCOMES

1. To understand the tools and description of java scripts.
2. To have knowledge of web servers and servlets.
3. To understand the concepts of JSP.
4. To handle errors in JSP pages and access database using JDBC programming.

COURSE CONTENTS

UNIT-I (11 Hrs)

HTML Common Tags- List, Tables, images, forms, Frames; Cascading Style sheets; Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script.

UNIT-II (11 Hrs)

Web Servers and Servlets: Tomcat web server, Introduction to Servelets: Lifecycle of a Serverlet, JSDK, The Servelet API, The javax.servelet Package, Reading Servelet parameters, Reading Initialization parameters. The javax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.

UNIT-III (12 Hrs)

Introduction to JSP: The Problem with Servelet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat.

JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods.

UNIT-IV (11 Hrs)

Error Handling: Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session.

Database Access: Database Programming using JDBC, Studying Javax.sql.* package, Accessing a Database from a JSP Page, Application – Specific Database Actions.

RECOMMENDED BOOKS

1. Chris Bates,'Web Programming, Building Internet Applications', 3rd Edn.,WILEY, 2006.
2. Patrick Naughton, Herbert Schildt,'The complete Reference Java 2', 5th Edn.,TMH, 2002.
3. Hans Bergsten, 'Java Server Pages', 3rd Ed., SPD O'Reilly, 2003.
4. Sebesta, 'Programming World Wide Web', 4th Edn., Pearson, 2008.

5. Marty Hall, Larry Brown, 'Core Servlets and Java Server Pages Vol. 1: Core Technologies', 2nd Edn., Pearson, 2003.
6. Dietel, Niet, 'Internet and World Wide Web – How to Program', 5th Edn., PHI/Pearson Education, 2011.
7. Murach, 'Murach's Beginning JAVA JDK 5', SPD, 2005.
8. Wang, 'An Introduction to Web Design and Programming', 1st Edn., Cengage Course, 2003.
9. Craig D. Knuckles, 'Web Applications Technologies Concepts-Knuckles', 2nd Edn., John Wiley, 2006.
10. Jon Duckett, 'Beginning Web Programming', 1st Edn., WROX, 2007.

SYSTEM ANALYSIS AND DESIGN

Subject Code- BITES1-504 **L T P C** **Duration – 45 hrs.**
3 0 0 3

COURSE OBJECTIVE

The course has been designed to provide a solid foundation of systems principles and an understanding of how business function.

COURSE OUTCOMES

Upon successful completion of this course, the student will be able to:

1. Define and describe the five phases of the system development life cycle.
2. State at least five expected benefits from systems projects.
3. Explain at least three ways in which information systems support business requirements.
4. Describe how systems analysts interact with users, management, and other information systems professionals.
5. Develop data flow diagrams and decision tables.
6. Perform a feasibility study.
7. Evaluate systems development alternatives.
8. Solve realistic systems analysis problems.
9. Determine methods for evaluating the effectiveness and efficiency of a system.
10. Work as an effective team member on assigned projects.

COURSE CONTENTS

UNIT-I (11 Hrs)

Introduction: System definition and concepts: Characteristics and types of automated systems, Manual and Real-life Business sub-systems: Production, Marketing, Personal, Material, Finance Systems models types of models: Systems environment and boundaries, Real- time and distributed systems, Basic principles of successful systems.

Systems Analyst: Role and need of systems analyst, Qualifications and responsibilities, Systems Analyst as an agent of change.

System Development Cycle: Introduction to systems development life cycle (SDLC): Various phases of development: Analysis, Design, Development, Implementation, Maintenance Systems documentation considerations: Principles of systems documentation, Types of documentation and their importance, Enforcing documentation discipline in an organization.

UNIT-II (11 Hrs)

System Planning: Data and fact gathering techniques: Interviews, Group communication, Presentations, Site visits. Feasibility study and its importance Types of feasibility reports, System Selection plan and proposal Prototyping Cost-Benefit and analysis: Tools and techniques.

Systems Design and Modeling: Process modeling, Logical and physical design, Design representation, Systems flowcharts and structured charts, Data flow diagrams, Common diagramming conventions and guidelines using DFD and ERD diagrams. Data Modeling and systems analysis, Designing the internals: Program and Process design, Designing Distributed Systems.

UNIT-III (12 Hrs)

Input and Output: Classification of forms: Input/output forms design, User-interface design, Graphical interfaces.

Modular and Structured Design: Module specifications, Module coupling and cohesion, Top-down and bottom-up design.

System Implementation and Maintenance: Planning considerations, Conversion methods, producers and controls, System acceptance Criteria, System evaluation and performance, Testing and validation, Systems qualify Control and assurance, Maintenance activities and issues.

UNIT-IV (11 Hrs)

System Audit and Security: Computer system as an expensive resource: Data and Strong Media Procedures and norms for utilization of computer equipment, Audit of computer system usage, Audit trails, Types of threats to computer system and control measures: Threat to computer system and control measures, Disaster recovery and contingency planning.

Object Oriented Analysis and Design: Introduction to Object Oriented Analysis and design life cycle, object modeling: Class Diagrams, Dynamic diagramming modeling: state diagram, Dynamic modeling: sequence. Case study of the following systems (I) Inventory Control, (II) Railway Reservation System, (III) University Management System, (IV) Hospital management System.

RECOMMENDED BOOKS:

1. Elias M. Awad, ‘System Analysis and Design’.
2. Perry Edwards, ‘System Analysis and Design’.
3. Ames A. Senn, ‘Analysis and Design of Information Systems’.

DATABASE MANAGEMENT SYSTEM LABORATORY

Subject Code- BITES1-505 **L T P C** **Duration-30 hrs.**

0 0 2 1

PRACTICALS

1. Write the queries for Data Definition Language (DDL) in RDBMS.
2. Write the queries for Data Manipulation Language (DML) in RDBMS.
3. Write the queries for Data Control Language (DCL) in RDBMS.
4. Write SQL queries using logical operators
5. Write SQL queries using SQL operators

6. Write SQL query using character, number, date and group functions
7. Write SQL queries for relational algebra
8. Write SQL queries for extracting data from more than one table
9. Write SQL queries for sub queries, nested queries
10. Concepts for ROLL BACK, COMMIT & CHECK POINTS
11. Case studies on normalization

DESIGN AND ANALYSIS OF ALGORITHMS LABORATORY

Subject Code- BITES1-506 **L T P C** **Duration-30 hrs.**
0 0 2 1

PRACTICALS

1. Code and analyse to compute the greatest common divisor (GCD) of two numbers.
2. Code and analyse to find the median element in an array of integers.
3. Code and analyse to find the majority element in an array of integers.
4. Code and analyse to sort an array of integers using Heap sort.
5. Code and analyse to sort an array of integers using Merge sort.
6. Code and analyse to sort an array of integers using Quick sort.
7. Code and analyse Knapsack problem using dynamic programming
8. Code and analyse to find the shortest path for single source shortest path using dynamic programming.
9. Code and analyse to find the shortest path for All pair shortest path using dynamic programming.
10. Code and analyse to do a depth-first search (DFS) on an undirected graph. Implementing an application of DFS such as to find the topological sort of a directed acyclic graph.
11. Code and analyse to do a breadth-first search (BFS) on an undirected graph. Implementing an application of BFS such as (i) to find connected components of an undirected graph, OR (ii) to check whether a given graph is bipartite.
12. Code and analyse to find the minimum spanning tree in a weighted, undirected graph.
13. Code and analyse to find all occurrences of a pattern P in a given string S using KMP Method
14. Code and analyse to compute the convex hull of a set of points in the plane.

COMPUTER GRAPHICS

Subject Code- BITED1-511 **L T P C** **Duration – 45 hrs.**
3 0 0 3

COURSE OBJECTIVE

1. Understanding the fundamental graphical operations and implementation on computer.
2. To get a glimpse of recent advances in computer graphics.
3. Understanding user interface issues that make the computer easy for the novice to use.

COURSE OUTCOMES

1. Able to learn about the basics of graphics, its applications, uses and knowledge to draw different shapes in graphics on computer.
2. Ability to apply different 2-D and 3-D transformations on an object.

3. Learn clipping operations and various object filling techniques, different projections techniques. Various hidden surface removal.
4. Knowledge of Rendering techniques, Fractals and different colour models.

COURSE CONTENTS

UNIT I (11 Hrs)

Introduction: Computer Graphics and its applications, Elements of a Graphics, Graphics Systems: Video Display Devices, Raster Scan Systems, Random Scan Systems, Input devices. **Basic Raster Graphics**: Scan conversion- Point plot technique, Line drawing, Circle generating and Ellipse generating algorithms.

UNIT II (11 Hrs)

Two-dimensional Geometric Transformations: Basic Transformations-Translation, Rotation and Scaling, Matrix Representation and Homogeneous Coordinates, Composite Transformations, Reflection and Shearing transformations.

Elementary 3D Graphics: Matrix Representation of 3D transformations, Plane projections and its types, Vanishing points, Specification of a 3D view.

UNIT III (11 Hrs)

Clipping: Window to viewport transformation, Clipping Operations- Point Clipping, Line Clipping, Polygon Clipping and Text Clipping.

Filling Techniques: Scan line algorithms, Boundary-fill algorithm, Flood-fill algorithm.

Visibility: Image and object precision, Hidden edge/surface removal or visible edge/surface determination techniques; z buffer algorithms, Depth sort algorithm, Scan line algorithm and Floating horizon technique.

UNIT IV (12 Hrs)

Color Models: Properties of Light, Intuitive Color Concepts, RGB Color Model, CMY Color Model, HLS and HSV Color Models, Conversion between RGB and CMY color Models, Conversion between HSV and RGB color models, Color Selection and Applications.

Advance Topics: Introduction of Rendering, Fractals, Gourard and Phong shading.

RECOMMENDED BOOKS

1. Donald Hearn and M. Pauline Baker, ‘Computer Graphics’, 4th Edn., PHI/Pearson Education, 2010.
2. Zhigand Xiang, Roy Plastock, Schaum’s Outlines, ‘Computer Graphics’, 2nd Edn., Tata Mc-Graw Hill, 2001.
3. C. Foley, Van Dam, Feiner and Hughes, ‘Computer Graphics Principles & Practice’, 3rd Edn., Pearson Education, 2013.
4. Roy A. Plastock, Gordon Kalley, ‘Computer Graphics’, 1st Edn., Schaum’s Outline Series, 1986.

GRAPHICS AND MULTIMEDIA SYSTEMS

Subject Code- BITED1-512 **L T P C** **Duration – 45 hrs.**

3 0 0 3

COURSE OBJECTIVE

1. Demonstrate the working of graphics output primitive algorithms, clipping algorithms and apply two dimensional geometric transformations.

2. Illustrate 3-dimensional object representation and transformations.
3. Describe the Multimedia concepts, its architecture.
4. Explain various compression techniques for the efficient transmission of Multimedia data.

COURSE OUTCOMES

1. Student will demonstrate the working of graphics output primitive algorithms, clipping algorithms and can apply two dimensional geometric transformations.
2. Able to Illustrate 3D object representation.
3. Able to describe the Multimedia concepts, its architecture.
4. Able to explain various compression techniques for the efficient transmission of Multimedia data.

COURSE CONTENTS

UNIT I (12 Hrs)

Graphics Output primitives: points and lines, line drawing algorithms, circle and ellipse drawing algorithms, polygon generating and filling algorithms. 2D Transformations: Basic Transformations, matrix representation, translation, rotation, scaling, general pivot point rotation, general fixed-point scaling, general scaling directions, reflection, shear. Viewing: window to view port coordinate transformation, point clipping, Cohen and Sutherland line clipping algorithm, Sutherland and Hodgeman polygon clipping algorithm.

UNIT II (11 Hrs)

3D display methods. 3D object representation: polygon surfaces, curved lines and surfaces, Quadric surfaces. Introduction to Spline Representations, Bezier curves and surfaces. 3D Transformations: Translation, Rotation, Scaling. 3D Viewing: view plane, projections, clipping.

UNIT III (11 Hrs)

Multimedia System Design: Elements, Applications. Multimedia system architecture, Evolving technologies for Multimedia system, Defining objects, Multimedia Data Interface standards, Multimedia databases.

UNIT IV (11 Hrs)

Compression and Decompression: The need for Data Compression, Binary Image Compression Schemes - Color, Gray Scale and Still Video Image Compression. Video Image Compression - Audio Compression.

RECOMMENDED BOOKS

1. Steve Harrington, "Computer Graphics - A Programming Approach", McGraw Hill Book Co., Second Edition, 2007.
2. John F.Koegal Buford, "Multimedia System", Pearson Education Limited, Reprint 2008.
3. Ranjan Parekh, "Principles of Multimedia", Tata McGraw Hill, Second Edition, 2013.

FORMAL LANGUAGE AND AUTOMATA THEORY

Subject Code- BITED1-513 **L T P C** **3 0 0 3** **Duration – 45 hrs.**

COURSE OBJECTIVE

1. Develop a formal notation for strings, languages and machines.
2. Design finite automata to accept a set of strings of a language.

3. Identify the hierarchy of formal languages, grammars and machines.

COURSE OUTCOMES

1. Design finite automata to accept a set of strings of a language.
2. Design context free grammars to generate strings of context free language.
3. Design Turing machine for accepting context sensitive languages.
4. To learn Rice's theorem.

COURSE CONTENTS

UNIT I (11 Hrs)

Introduction: Alphabet, languages and grammars, productions and derivation, Chomsky hierarchy of languages.

Regular languages and finite automata: Regular expressions and languages, deterministic finite automata (DFA) and equivalence with regular expressions, nondeterministic finite automata (NFA) and equivalence with DFA, regular grammars and equivalence with finite automata, properties of regular languages, pumping lemma for regular languages, minimization of finite automata.

UNIT II (12 Hrs)

Context-free languages and pushdown automata: Context-free grammars (CFG) and languages (CFL), Chomsky and Greibach normal forms, nondeterministic pushdown automata (PDA) and equivalence with CFG, parse trees, ambiguity in CFG, pumping lemma for context-free languages, deterministic pushdown automata, closure properties of CFLs.

UNIT III (12 Hrs)

Context sensitive languages: Context-sensitive grammars (CSG) and languages, linear bounded automata and equivalence with CSG.

Turing machines: The basic model for Turing machines (TM),Turing-recognizable (recursively enumerable) and Turing-decidable (recursive) languages and their closure properties, variants of Turing machines, nondeterministic TMs and equivalence with deterministic TMs, unrestricted grammars and equivalence with Turing machines, TMs as enumerators.

UNIT IV (10 Hrs)

Undecidability: Church-Turing thesis, universal Turing machine, the universal and diagonalization languages, reduction between languages and Rice's theorem, undecidable problems about languages.

RECOMMENDED BOOKS

1. John E. Hopcroft, Rajeev Motwani and Jeffrey D. Ullman, Introduction to Automata Theory, Languages, and Computation, Pearson Education Asia.
2. Harry R. Lewis and Christos H. Papadimitriou, Elements of the Theory of Computation, Pearson Education Asia.
3. Dexter C. Kozen, Automata and Computability, Undergraduate Texts in Computer Science, Springer.
4. Michael Sipser, Introduction to the Theory of Computation, PWS Publishing.
5. John Martin, Introduction to Languages and The Theory of Computation, Tata McGraw Hill.

SIGNALS AND SYSTEMS

Subject Code- BITED1-514 **L T P C** **Duration – 45 hrs.**
3 0 0 3

COURSE OBJECTIVE

1. To introduce the students about the theoretical concepts associated with processing continuous & discrete time signals & systems.
2. To make the students aware about the signal transmission through linear networks.
3. To be able to think critically & to apply problem solving & reasoning strategies to the analysis of various types of signals & systems.
4. To impart them knowledge of various types of noises.

COURSE OUTCOMES

1. Analyse properties of signals & systems and representation in time & frequency domain.
2. Classify systems based on their properties and determine the response of LSI system.
3. Apply random signal theory and understand various types of noise.
4. Understand the process of sampling and reconstruction.

COURSE CONTENTS

UNIT-I (12 Hrs)

Classification of Signals and Systems: Energy and power signals, continuous and discrete time signals, continuous and discrete amplitude signals, System properties: linearity, additivity and homogeneity, shift in variance, causality, stability, realizability. **Fourier Representation:** The notion of a frequency response and its relation to the impulse response, Fourier series representation, the Fourier Transform, convolution/multiplication and their effect in the frequency domain, magnitude and phase response, Fourier domain duality, Convolution theorem and its graphical interpretation, Parseval's Theorem, idea of signal space and orthogonal bases.

UNIT-II (11 Hrs)

Linear Shift-invariant (LSI) Systems: Impulse response and step response, convolution, input-output behaviour with aperiodic convergent inputs. Characterization of causality and stability of linear shift invariant systems, System representation through differential equations and difference equations, Periodic and semi-periodic inputs to an LSI system,

Introduction to Noise: Thermal Noise, Shot noise, Partition noise, Flicker noise, Gaussian Noise. Equivalent input noise, Signal to Noise Ratio (SNR), Noise Temperature, Noise equivalent Bandwidth, Noise Figure.

UNIT-III (11 Hrs)

Random Signal Theory: Introduction to Probability Theory, Joint and Conditional Probability, Random Events, Probability Mass Function, Statistical Averages. Probability Density Functions (PDF) and Statistical Averages, mean, moments and expectations, standard deviation and variance, Probability models: Uniform, Gaussian, Binomial, Examples of PDF, Transformation of Random Variables, Random Processes, Stationary and Ergodicity, Auto-correlation, cross correlation, energy/power spectral density, properties of correlation and spectral density, inter relation between correlation and spectral density.

UNIT-IV (11 Hrs)

Sampling and Reconstruction: Sampling Theorem and its implications- Spectra of sampled signals, Reconstruction: ideal interpolator, zero-order hold, first-order hold, and so on, Aliasing and its effects, Relation between continuous and discrete time systems. Concept of State-space analysis: State-space analysis and multi-input, multi-output representation, the state-transition matrix and its role.

RECOMMENDED BOOKS:

1. A.V.Oppenheim, A.S.Willsky and I.T.Young, "Signals and Systems",Prentice Hall, 1983.
2. R.F. Ziemer, W.H. Tranter and D.R. Fannin, "Signals and Systems - Continuous and Discrete", 4th edition, Prentice Hall, 1998.
3. A. Papoulis, "Circuits and Systems: A Modern Approach", HRW, 1980.
4. B.P. Lathi, "Signal Processing and Linear Systems", Oxford University Press, c1998.
5. Douglas K. Lindner, "Introduction to Signals and Systems", Mc-Graw Hill International Edition: c1999.
6. Simon Haykin, Barry van Veen, "Signals and Systems", John Wiley and Sons (Asia) Private Limited, c1998.
7. Robert A. Gabel, Richard A. Roberts, "Signals and Linear Systems", John Wiley and Sons (SEA) Private Limited, c1995.
8. M. J. Roberts, "Signals and Systems - Analysis using Transform methods and MATLAB", Tata Mc Graw Hill Edition, 2003.
9. I. J. Nagrath, S. N. Sharan, R. Ranjan, S. Kumar, "Signals and Systems", Tata Mc Graw Hill Publishing Company Ltd., New Delhi, 2001.
10. Ashok Ambardar, "Analog and Digital Signal Processing", Second Edition, Brooks/ Cole Publishing Company (An international Thomson Publishing Company), c1999.

FINANCE & ACCOUNTING

Subject Code: BHSMC0-015 **L T P C** **Duration- 45 Hrs**

3 0 0 3

Course Objectives:

The main aim of this course is:

1. To provide an in-depth view of the process in financial management of the firm
2. To develop knowledge on the allocation, management and funding of financial resources.
3. To improving students' understanding of the time value of money concept and the role of a financial manager in the current competitive business scenario.
4. To enhancing student's ability in dealing short-term and long term dealing with day-to-day working capital decision and raising finance.

Course Outcomes: After completing this course the students should be able to:

1. Explain the concept of fundamental financial concepts, especially time value of money.
2. Apply capital budgeting projects using traditional methods.
3. Analyze he main ways of raising capital and their respective advantages and disadvantages in different circumstances
4. Integrate the concept and apply the financial concepts to calculate ratios and do the capital budgeting

Unit-I (12 Hrs.)

Introduction to Accounting: Meaning, Objectives, Basic Accounting Terms. Accounting Principles: Meaning and Nature, Accounting Concepts, Bases of Accounting, Nature of Accounts, Origin of Transactions Source Documents and Vouchers Accounting Equations Rules of Debit and Credit Recording of Transactions: Book of Original Entry-Journal, Ledger Posting from Journal and Ledger Balancing, Subsidiary Books

Unit-II (11 Hrs.)

Nature, Scope and Objectives of Financial Management, Profit Maximization Vs Wealth Maximization, Financial Planning, Forms of Business Organization, Role of Financial Manager.

Capital Structure – Introduction, Factors Affecting Capital Structure, Liquidity Ratios. Capital Structure Theories: Net Income Approach, Net Operating Income Approach, Traditional Approach, Modigliani-Miller Model (MM).

Unit-III (11 Hrs.)

Working Capital Decision: Meaning, Nature and Scope of Working Capital - Component of Working Capital – Factors affecting Working Capital, Working Capital Strategies, Capital Budgeting Techniques: Discounted and Non-Discounted Methods (Pay Back, ARR, NPV, IRR, Benefit Cost Ratio), Long Term and Short Term Sources of Funds.

Unit-IV (11 Hrs.)

Long Term Sources of Funds: Equity share, Preference shares, Debentures, Bonds, Warrants, Venture capital and Ploughing back of profits. Short Term Sources of Funds: Commercial Paper, Certificate of Deposit, Treasury Bills.

Recommended Books

1. Brigham, 'Financial Management: Text & Cases', Cengage Learning.
2. Brealy&Myres, 'Principles of Corporate Finance', Tata McGraw Hill.
3. Ambrish Gupta, 'Financial Accounting for Management', 2nd Edn., Pearson Education.
4. I.M. Pandey, 'Financial Management', Vikas Publishers.
5. S.P. Jain and K.L. Narang,'Principles of Accounting',Kalyani Publishers, New Delhi, 2004.