

1SCPRGT: PROGRAMMING USING C	
Total Teaching Hours : 52	No. Of Lecture Hours/Week:4
Max Marks:70	Credit :4
Course Objective:	
<ul style="list-style-type: none"> The course provides students with a comprehensive study of C programming language. The course lectures stress the strengths of C, which provides the outcome of writing efficient, maintainable and portable code. Course includes few lab exercises to make sure the student has not only gained the knowledge but can also apply and execute it. 	
<p>Course Outcome:</p> <p>Upon successful completion of the course the student will be able to:</p> <p>CO1:To clearly understand the logic of the problem.</p> <p>CO2: To analyze the given problem and write the algorithm and flowchart</p> <p>CO3: To write structured C programs, this is the foundation of any programming language.</p> <p>CO4:Design programs involving decision structures, loops and functions.</p> <p>CO5: Understand the dynamics of memory by the use of pointers and Structures.</p>	
UNIT 1 -INTRODUCTION	Teaching Hours :10
<p>Introduction to Programming Concepts: Software, Classification of Software, Modular Programming, Structured Programming, Algorithms and Flowcharts with examples. Overview of C Language: History of C, Character set, C tokens, Identifiers, Keywords, Data types, Variables, Constants, Symbolic Constants , Operators in C, Hierarchy of Operators, Expressions, Type Conversions and Library Functions.</p>	
UNIT 2- Managing Input and Output Operation:	Teaching Hours :10
<p>Formatted and Unformatted I/O Functions, Decision making, branching and looping: Decision Making Statements - if Statement, if- else statement, nesting of if-else statements, else-if ladder, switch statement,?: operator, Looping - while, do-while, for loop, Nested loop, break, continue, and goto statements. Functions: Function</p>	

Definition, prototyping, types of functions, passing arguments to functions, Nested Functions, Recursive functions.	
UNIT 3 -ARRAYS	Teaching Hours :10
Declaring and Initializing, One Dimensional Arrays, Two Dimensional Arrays, Multi Dimensional Arrays - Passing arrays to functions. Strings: Declaring and Initializing strings, Operations on strings, Arrays of strings, passing strings to functions. Storage Classes - Automatic, External, Static and Register Variables.	
UNIT 4 -STRUCTURES	Teaching Hours :12
Declaring and Initializing, Nested structure, Array of Structure, Passing Structures to functions, Unions, typedef, enum, Bit fields. Pointers – Declarations, Pointer arithmetic, Pointers and functions, Call by value, Call by reference, Pointers and Arrays, Arrays of Pointers, Pointers and Structures. Meaning of static and dynamic memory allocation, Memory allocation functions.	
UNIT 5 -FILES	Teaching Hours :10
File modes, File functions, and File operations, Text and Binary files, Command Line arguments. C Preprocessor directives, Macros – Definition, types of Macros, Creating and implementing user defined header files.	
Text Books:	
1.E. Balaguruswamy, “ Programming In ANSI C ”, 4th edition, TMH Publications, 2007 2. Ashok N. Kamthane, “ Programming with ANSI and Turbo C ”, Pearson Education, 2006	
Reference Text Books:	
1. Ashok N. Kamthane et. al., “ Computer Programming and IT ”, Pearson Education, 2011 2. Mahapatra, “ Thinking In C ”, PHI Publications, 1998. 3. Yashwant Kanetkar, “ Let Us C ”, 13th Edition, PHP, 2013.	

2SDAST: DATA STRUCTURE USING C

Total Teaching Hours : 52	No. Of Lecture Hours/Week:4
Max Marks:70	Credit 4
Course Objective:	
<p>Data Structure is considered as one of the fundamental paper towards a more comprehensive understanding of programming application and development. The objective of this course is to teach students various data structures and to explain them algorithms for performing various operations on these data structures.</p>	
<p>Course Outcome:</p> <p>Upon successful completion of the course the student will be able to:</p> <p>CO1: Demonstrate familiarity with major algorithms and data structures.</p> <p>CO2: Analyze performance of algorithms and choose the appropriate data structure and algorithm design method for a specified application.</p> <p>CO3: Determine which algorithm or data structure to use in different scenarios and be familiar with writing recursive methods.</p> <p>CO4: Demonstrate understanding of the abstract properties of various data structures such as stacks, queues, lists, trees and graphs and Use various data structures effectively in application programs.</p> <p>CO5: Demonstrate understanding of various sorting algorithms, including bubble sort, insertion sort, selection sort, heap sort and quick sort.</p>	
UNIT 1 -INTRODUCTION	Teaching Hours :10
<p>Introduction and Overview: Definition, Elementary data organization, Data Structures, data structures operations, Abstract data types, algorithms complexity, time-space tradeoff. String Processing: Definition, Storing Stings, String as ADT, String operations, word/text processing, Pattern Matching algorithms.</p>	
UNIT 2- ARRAYS	Teaching Hours :10
<p>Introduction and Overview: Definition, Elementary data organization, Data Structures, data structures operations, Abstract data types, algorithms complexity, time-space tradeoff. Preliminaries: Mathematical notations and functions,</p>	

Algorithmic notations, control structures, Complexity of algorithms, asymptotic notations for complexity of algorithms. String Processing: Definition, Storing Strings, String as ADT, String operations, word/text processing, Pattern Matching algorithms.	
UNIT 3 –LINKED LIST	Teaching Hours :12
Definition, Representation of Singly linked list in memory, Traversing a Singly linked list, Searching a Singly linked list, Memory allocation, Garbage collection, Insertion into a singly linked list, Deletion from a singly linked list; Doubly linked list, Header linked list, Circular linked list.	
UNIT 4 –STACKS AND QUEUES	Teaching Hours :12
Definition, Array representation of stacks, Linked representation of stacks, Stack as ADT, Arithmetic Expressions: Polish Notation, Application of Stacks, Recursion, Towers of Hanoi, Implementation of recursive procedures by stack. Queues – Definition, Array representation of queue, Linked list representation of queues Types of queue: Simple queue, Circular queue, Double ended queue, Priority queue, Operations on Queues, Applications of queues.	
UNIT 5 -TREE	Teaching Hours :08
Definitions, Binary trees, Representing binary trees in memory, Traversing Binary Trees, Binary Search Trees, Searching, Inserting and Deleting in a Binary Search Tree.	
Text Books:	
<ol style="list-style-type: none"> 1. Horowitz, Sahni and Anderson-Freed, “Fundamentals of Data Structures in C”, 2nd Edition, University Press, 2007, 2. Yashwant Kanetkar, “Data Structure Through C”, 9th Edition, BPB Publication 2010 3. Seymour Lipschutz, “Data Structures with C”, Schaum’s outLines, Tata McGraw-Hill, 2011. 	
Reference Text Books:	

1. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C”, Second Edition, Pearson Education, 2013.
- 2 . Robert Kruse, C.L.Tondo, Bruce Leung, Shashi Mogalla, “Data Structures and Program Design using C”, Pearson Education, 2009.
3. Forouzan, “A Structured Programming Approach using C”, 2nd Edition, Cengage Learning India, 2008.

3SJA VAT: OBJECT ORIENTED PROGRAMMING USING JAVA	
Total Teaching Hours : 52	No. Of Lecture Hours/Week:4
Max Marks:70	
Course Objective:	
Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc. Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.	
Course Outcomes:	
<p>At the end of this course student will:</p> <p>CO1. Understand the concept and underlying principles of Object-Oriented Programming</p> <p>CO2. Understand how object-oriented concepts are incorporated into the Java programming language .</p> <p>CO3. Develop problem-solving and programming skills using OOP concept.</p> <p>CO4. Understand the benefits of a well structured program .</p> <p>CO5. Develop the ability to solve real-world problems through software development in highlevel programming language like Java.</p>	

<p>CO6. Develop efficient Java applets and applications using OOP concept. CO7. Become familiar with the fundamentals and acquire programming skills in the Java language.</p>	
UNIT 1	Teaching Hours :10
Introduction to JAVA:	
<p>Fundamentals of Object Oriented Programming – Introduction, Object Oriented Paradigm – Basic Concepts of Object Oriented Programming – Benefits of OOP- Applications of OOP. JAVA evolution, Java History, Java Features, How Java Differs from C and C++, Java and Internet, Java and World Wide Web, Web Browsers, Java Environment. Overview of JAVA Language: Introduction, Simple Java program, Implementing a Java Program, Java Virtual Machine, Command Line Arguments, Data Types: Introduction, Constants, Variables, Data Types, Declaration of Variables, Giving Values to Variables, Scope of Variables, Symbolic Constants.</p>	
UNIT 2	Teaching Hours :10
Classes, Arrays, Strings and Vectors:	
<p>Introduction, Defining a Class, Adding Variables, Adding Methods, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting of Methods, Inheritance: Extending a Class, Overriding Methods, Final Variables and Methods, finalizer methods, Abstract Methods and Classes, Visibility Control. Arrays, Strings and Vectors: Arrays, One-dimensional Arrays, Creating an Array, Two -Dimensional Arrays, Strings, Vectors, Wrapper Classes</p>	
UNIT 3	Teaching Hours :12
Interfaces, Packages, and Multithreaded Programming:	
<p>Interfaces: Multiple Inheritance: Introduction, Defining Interfaces, Extending Interfaces, Implementing Interfaces, Accessing Interface Variables. Packages: Putting Classes together: Introduction, Java API Packages, Using System Packages, Naming Conventions, Creating Packages, Accessing a Package, Using a Package, Adding a Class to a Package, Hiding Classes. Multithreaded Programming: Introduction, Creating Threads, Extending the Thread Class, Stopping and Blocking a thread, Life Cycle of a thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization, Implementing the ‘Runnable’ Interface.</p>	

UNIT 4	Teaching Hours :12
Managing Exceptions, Applet Programming:	
<p>Managing Errors and Exception: Introduction, Types of Exception Handling Code, Multiple Catch Statements, Using Finally Statement, Throwing Our Own Exceptions, Using Exceptions for Debugging.</p> <p>Applet Programming: Introduction, How Applets Differ from Applications, Preparing to Write Applets, Building Applet Code, Applet Life Cycle, Creating an Executable applet, Applet Tag, Adding Applet to HTML File, running the Applet, Displaying Numerical Values, Getting Input from the User.</p>	
UNIT 5	Teaching Hours :08
Graphics Programming , AWT controls I/O:	
<p>Graphics programming: Introduction, The Graphics Class, Lines and rectangles, circles, and Ellipses, Drawing Arcs, Drawing Polygons, Lines Graphs, Drawing Bar Charts.</p> <p>AWT controls: Button, Choice, Label, checkbox, checkboxgroup, textfield.</p>	
Essential Text Books:	
<ul style="list-style-type: none"> • Programming with java by E Balagurusamy. 	
Reference Text Books:	
<ul style="list-style-type: none"> • JAVA 2: THE COMPLETE REFERENCE , by Herbert Schildt. • Java Programming Beginners Guide by Richard Dorsey. • Core Java Programming by Tushar B. Kute 	

4SUNIXT: UNIX PROGRAMMING

Total Teaching Hours : 54	No. Of Lecture Hours/Week:4
Max Marks:70	
Course Objective:	
<ul style="list-style-type: none">• To understand the fundamental design of the unix operating system• To become fluent with the systems calls provided in the unix environment• To be able to design and build an application/service over the unix operating system	
Course Outcome:	
On successful completion of this course, the students will be able to	
<ul style="list-style-type: none">• Understanding the basic set of commands and utilities in Linux/UNIX systems.• To learn to develop software for Linux/UNIX systems.• To learn the C language and get experience programming in C.• To learn the important Linux/UNIX library functions and system calls.	
UNIT 1	Teaching Hours :12
Introduction	
Introduction: History, salient features, Unix system architecture, Unix command format, Unix internal and external commands, Directory commands, File related commands, Disk related commands, general utilities. Unix File System: Boot inode, super and data block, in-core structure, Directories, conversion of pathname to inode, inode to a new file, Disk block allocation. Process Management: Process state and data structures of a Process, User vs, kernel node, context of a Process, background processes, Process scheduling commands, Process terminating and examining commands.	

UNIT 2	Teaching Hours :12
Secondary storage management	
Secondary Storage Management: Formatting, making file system, checking disk space, mountable file system, disk partitioning, file compression. Special Tools and Utilities: Filters, Stream editor SED and AWK, Unix system calls and library functions, Processes, signals and Interrupts, storage and compression facilities.	
UNIT 3	Teaching Hours :10
Shell Programming	
Shell Programming: Vi editor, shell types, shell command line processing, shell script features, executing a shell script, system and user-defined variables, expr command, shell screen interface, read and echo statement, command substitution, escape sequence characters, shell script arguments, positional parameters, test command, file test, string test, numeric test.	
UNIT 4	Teaching Hours :10
Conditional Control Structures	
Conditional Control Structures-if statement, case statement Looping Control Structure-while, until, for, statements. Jumping Control Structures – break, continue, exit. Shell Programs covering the above concepts.	
UNIT 5	Teaching Hours :10
Unix System Communication	
Unix System Communication: Introduction, write, read, wall commands, sending and handling mails. System Administration: Roles of a System Administrator, File System Maintenance, System Startup and Shutdown, User Management, Backup and Restore, Demons, Domain Name System DNS, Distributed File System.	
Text Books:	
1. M.G.Venkateshmurthy, “Introduction to UNIX & SHELL Programming”, First Edition, Pearson Education, 2004	
Reference Text Books:	

1. Forouzan,“Unix and Shell Programming”, 1st Edition,2008 Cengage Learning India

2.UNIX and Shell Programming, Archana Verma, Firewall Media

5SDBMST: DATABASE MANAGEMENT SYSTEM

Total Teaching Hours : 42	No. Of Lecture Hours/Week:3
Max Marks:	70
Course Objective:	
To provide strong foundation of database concepts and develop skills for the design and to implement a database application using SQL.	
<p><u>Course Outcome:</u></p> <p>CO1:Understanding the DBMS terms, concepts, and tools of relational database management systems.</p> <p>CO2 : Understanding database design and logic development for database programming.</p>	
UNIT 1	Teaching Hours :12
INTRODUCTION	
Data, Database, Database management system, Characteristics of the database approach, Database users, Advantages of Using a DBMS and When not to use a DBMS. Data Models, Categories of data models, Schemas, DBMS Architecture and Data Independence, The Three schema architecture, DBMS Languages and Interfaces, Classifications of DBMS	
UNIT 2	Teaching Hours :12
E-R MODEL AND FILE ORGANIZATIONS	
Entity types, Entity Sets, Attributes and Keys. Relationships, Relationship types, Roles and Structural constraints. Weak and strong Entity Types and Drawing E- R Diagrams. Naming conventions and design issues, Preparing E-R diagrams for a problem.	
Record storage and primary file organization, heap files, Single Level Ordered Indexes, Primary indexes, Clustering indexes and Secondary indexes	

UNIT 3	Teaching Hours 12
RELATIONAL MODEL AND NORMALIZATION.	
<p>Relation, Integrity constraints - domain, entity and Referential integrity constraints, Basic Relational Algebra operations, select, project and join operations.</p> <p>Functional dependencies and Normalization for Relational Databases - Normalization concepts, first, second, third normal forms and Boyce-Codd normal form.</p>	
UNIT 4	Teaching Hours :06
STRUCTURED QUERY LANGUAGE(SQL)	
<p>SQL Basics, SQL data definition and data types, specifying constraints in SQL, Basic queries like INSERT, DELETE ,ALTER and UPDATE statements in SQL, More Complex SQL queries for grouping and built in functions, Joining tables using equi, left, right joins</p>	
Essential Text Books:	
<p><i>1. Fundamentals of Database Systems, By Elmasri Ramez and NavatheShamkantB, Addison-Wesley, 6th Edition, 2010.</i></p>	
Reference Text Books:	
<ol style="list-style-type: none"> 1. <i>Database System Concepts, By Silberschatz, Korth, Sudarshan, 5th Edition, McGraw Hill, 2006.</i> 2. <i>Introduction to database management system by By Atul Kahate, 1/e, pearson publications</i> 	

5SWEBPT: WEB PROGRAMMING

Total Teaching Hours : 42 Max Marks:70	No. Of Lecture Hours/Week:3
Course Objective:	
Web programming gives a comprehensive introduction to web programming technologies like HTML, CSS , java script, php. This course helps the student to build multiple webpages and implement, website design that interacts with a database.	
Course Outcome:	
Upon successful completion of the course the student will be able to:	
<ul style="list-style-type: none"> ○ Select and apply markup languages for processing, identifying, and presenting of information in web pages. ○ Use scripting languages and web services to transfer data and add interactive components to web pages. ○ Incorporate formal concepts of layout and organization to design websites that effectively communicate using visual elements. ○ Students are able to develop a dynamic webpage by the use of java script. ○ Implement interactive web page(s) using HTML, CSS and JavaScript. ○ Build Dynamic web site using server side PHP Programming and Database connectivity. 	
UNIT 1	Teaching Hours :17
Basic Internet Concepts and HTML Concepts	
History of Internet, security, Internet protocols, Introduction to OSI and TCP/IP reference models , Internet addressing, FTP, HTTP, Telnet, MIME, Email. Basic HTML Structure, Common HTML Tag, Basic syntax, Standard XHTML document structure, Basic text markup, Images, Embedding Audio, Video, Hypertext Links, Lists, Tables, frames and forms.	
UNIT 2	Teaching Hours :17
CSS and Java Script	

Introduction, Levels of style sheets, Style specification formats, Types of Selector, Font properties, List properties, Color, Alignment of text, Borders, Background images.

Introduction to Java Script, Embedding Java script in HTML using the script tag, Identifier & operator, JS variables, JS comments, JS functions, validation, Document object model(DOM), DOM Objects(window, navigator, history, location) , DOM levels. Element access in JavaScript; Predefined functions, string functions, Array functions in Java scripts, Events and event handling; Handling events from the Body elements, Button elements

UNIT 3

Teaching Hours :08

PHP:

Introduction to PHP, PHP syntax, PHP variables , PHP loops , PHP functions, PHP Strings, PHP arrays, PHP sessions and cookies, Mysql database connection

Text Books:

1. [HTML Black Book](#) by [Steven Holzner](#)
2. [HTML & CSS: The Complete Reference](#) by [Thomas Powell](#)
3. [PHP: The Complete Reference](#) by [Steven Holzner](#)

Reference Text Books:

1. [Mastering HTML, CSS & Javascript Web Publishing](#) by [Laura Lemay](#) , [Rafe Colburn](#) , [Jennifer Kyrnin](#)
2. [Web Technologies: HTML, JAVASCRIPT, PHP, JAVA, JSP and Black Book](#) by [Kogent](#).

6SPYHT: PYTHON PROGRAMMING

Total Teaching Hours: 52	No. Of Lecture Hours/Week: 04
Max Marks: 70	Credits : 4
Course Objective:	
<ul style="list-style-type: none"> • Learn the syntax and semantics of Python programming language. • Illustrate the process of structuring the data using lists, tuples and dictionaries. • Demonstrate the use of built-in functions to navigate the file system. • Implement the Object Oriented Programming concepts in Python. • Demonstrate the use of Regular Expression and handling file operations 	
Course Outcome:	
<ul style="list-style-type: none"> • Demonstrate proficiency in handling of loops and creation of functions. • Identify the methods to create and manipulate lists, tuples and dictionaries. • Discover the commonly used operations involving regular expressions and file system. • Interpret the concepts of Object-Oriented Programming as used in Python. • Problem solving and programming capability. 	
<p>Overview: Why Python, features, setting up path, working with python, basic syntax, identifiers, keywords, variable and data type operators, comments.</p> <p>Object oriented programming: Introductions, OOP, classes, class attributes, classes with multiple objects, instances, instance attributes, Encapsulation, Basics of polymorphism: Operator and function overloading, Constructor and Destructor, inheritance</p>	
UNIT 1: CONTROL STATEMENTS	Teaching Hours :12
<p>Indentation, Reading input, print output, type conversion.</p> <p>Condition statements: if, if-else, nested if</p> <p>Looping: for, while, Nested loop</p> <p>Control statements: Break, continue, pass</p> <p>Exception handling: try and except, raising exception.</p>	

UNIT 2: FUNCTIONS, MODULES & STRINGS	Teaching Hours :12
<p>Functions- Build in functions, function definition and calling the function, command line arguments, Lambda, MAP, Filters and User defined Functions.</p> <p>Modules: What are modules, modules and files, importing modules, Introduction to Numpy.</p> <p>Strings: str functions, slicing &Joining, string methods, string formatting</p>	
UNIT 3: TUPLES, LIST & DICTIONARIES	Teaching Hours 10
<p>Tuples and sets: basic tuple operations, indexing and slicing in tuples, built in function, tuple methods, sets, sets methods, frozenset.</p> <p>Lists: list function, indexing & slicing, list methods.</p> <p>Dictionaries: creating, accessing and modifying, dictionary methods.</p>	
UNIT 4: REGULAR EXPRESSION, ERROR & EXCEPTIONS, MAGIC METHODS	Teaching Hours :08
<p>Regular expression: using special characters, regular expression methods.</p> <p>Error & Exceptions: Introduction to exceptions in python, detecting and handling exceptions, exceptions as strings, raising exceptions, assertions, standard exceptions.</p> <p>Magic Methods: Magic Method syntax, Available Methods</p> <p>Introduction to file operation: opening a file, Techniques for reading files, writing files</p>	
UNIT 5: DECORATORS, GENERATORS & DATABASE	Teaching Hours :10
<p>Decorators: Understanding Decorators, Decorator Syntax, Decorators Functions, Decorator classes.</p> <p>Context Managers: Context manager syntax, when you should write context managers.</p> <p>Generators: Understanding Generators, Generator syntax, Generator Examples</p> <p>OOP for Database Programming: Introduction, Architecture, Steps for Connecting Database, Basic Operations with Examples</p>	

Essential Text Book:

1. Python for Everybody: Exploring Data in Python 3, by Dr. Charles Russell Severance, Sue Blumenberg.
2. Introduction to Python Programming by Gowrishankar S, Veena A, 1st Edition, CRC Press/Taylor & Francis, 2018. ISBN-13: 978-0815394372,
3. Programming in Python 3 A Complete Introduction to the Python Language, Mark Summerfield, Addison-Wesely Reprint 2011
4. "Beginning Python: from novice to professional". 3rd Edition, Hetland, Magnus Lie., Apress, ISBN 978-1-4842-0029-2, 2017
5. An Introduction to computer Science using Python 3.6, Paul Gries, Jennifer Campbell, Jason Montojo, 3rd Edition, Shroff publishers and distrubtors Pvt, Ltd. ISBN: 13:978935213681-0, 2018

Reference Text Books:

1. Barry, Paul, *Head First Python*, 2nd Edition, ORIelly, 2012.
2. Lutz, Mark, *Learning Python*, 4th Edition, O Rielly, 2013
3. Sneeringer, Luke, "Professional Python", John Wiley & Sons, ISBN -978-1-119-07085-6, 2016.
4. Wesley J Chun, "Core Python Programming", third edition, Pearson Education, ISBN 13: 978-0-13-267820-9, 2012
5. Think Python, Allen Downey, Version 2.0.17, Green Tea Press, Needham, Massachusetts, 2012

6SCOMT: COMPUTER NETWORKS

Total Teaching Hours : 42	No. Of Lecture Hours/Week:3
Max Marks:70	
Course Objective:	
<ul style="list-style-type: none"> • To master the terminology and concepts of the OSI reference model and the TCP/IP reference model. • To master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks, . • To be familiar with contemporary issues in networking technologies, 5. To be familiar with network tools and network programming 	
<p>Course Outcome:</p> <ul style="list-style-type: none"> • Independently understand basic computer network technology. • Understand and explain Data Communications System and its components. • Identify the different types of network topologies and protocols. • Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer. • Identify the different types of network devices and their functions within a network 	
UNIT 1: Introduction	Teaching Hours :14
<p>Introduction,Characteristics–Delivery,Accuracy,Timelinessand JitteComponents–Message, Sender, Receiver, Transmissionmediumand protocol</p> <p>Topology–Mesh, Star,Tree,Bus,Ringand HybridTopologies</p> <p>Transmissionmodes–Simplex,HalfDuplex,Full Duplex</p> <p>Categoriesofnetworks–LAN,MAN,WAN</p> <p>Network Components–SignalTransmission–AnalogSignaling,conceptofASK,FSK, PSK,Digital Signaling,conceptofUnipolar,Polar,Return-to-Zero(RZ), Biphase, Manchester,DifferentialManchester,Non-Return-to-Zero (NRZ),BitSynchronization,</p>	

<p>Asynchronous Bit Synchronization and Synchronous Bit Synchronization, Baseband and Broadband Transmissions.</p> <p>Guided Media– Twisted-Pair Cable, Coaxial Cable, Fiber-Optic Cable</p> <p>Unguided Media– Radio Wave Transmission Systems, Microwave Transmission Systems, Infrared Transmission Systems and Satellite Communication System.</p>	
UNIT 2	Teaching Hours :14
<p>The OSI Model– Functions of all the Seven Layers</p> <p>Networking Devices– Functions and Applications of Hub, Switches, Bridges, Repeaters</p> <p>Internet Networking Devices– Functions and Applications of Routers and Gateways</p> <p>IP Addressing– Dynamic IP Addressing, Static IP Addressing, Types of IP Addresses</p> <p>Protocols– Overview only- TCP, UDP, IP, IPV4, IPV6, TCP/IP Suite, SMTP, POP3, SNMP, HTTP, FTP, DNS, ICMP, IGMP, ARP, RARP, OSPF, BGP, ALOHA</p>	
UNIT 3	Teaching Hours :14
<p>Packet Switching Networks– Network Services and Internal Network Operations, Packet Network Topology, Datagrams and Virtual Circuits, Connectionless Packet Switching, Virtual Circuit Packet Switching.</p> <p>Routing Concepts– Routing Tables, Dijkstra’s Shortest Path Routing Algorithm, Congestion Control Algorithms- Leaky Bucket Algorithm.</p> <p>Data Link Issues– Single bit error and Burst Error, concepts of Redundancy, Checksum, Single Bit Error correction and Hamming Code correction method.</p>	
Essential Text Books:	
<p>1. Behrouz A Forouzan, <i>Data communication and networking</i>, McGraw-Hill, 5th edition, 2011.</p>	

Reference Text Books:

1. Andrew S.Tanenbaum, “Computer Networks”,Fifth Edition, PrenticeHall, 2012
2. S. Keshav, “An Engineering Approach to Computer Networks”, Pearson Education, 2ndEdition.