

**ALAGAPPA UNIVERSITY, KARAIKUDI**  
**NEW SYLLABUS UNDER CBCS PATTERN (w.e.f.2017-18)**

**B.Sc., INFORMATION TECHNOLOGY – PROGRAMME STRUCTURE**

Sem	Part	Course Code	Title of the Course	Cr.	Hrs./ Week	Marks		
						Int.	Ext.	Total
1	1	711T	Tamil/other languages – 1	3	6	25	75	100
	11	712E	English – 1	3	6	25	75	100
	111	7B1T1C1	Core – 1 – Principles of Information Technology	4	6	25	75	100
		7B1T1P1	Core – 11 – Office Automation Lab	4	6	40	60	100
			Allied – 1 (Theory only) (or)	5	5	25	75	100
			Allied – 1 (Theory cum Practical)	4	3	15	60	75
			Allied Practical – 1	-	2**	--	--	--
111	7NME1A/ 7NME1B/ 7NME1C	(1) Non-Major Elective- 1 – (A) jkpo; nkhopapd; mbg;gilfs;/ (B) .f;fhy .yf;fpak; / (C) Communicative English	2	1	25	75	100	
<b>Total(Allied -Theory only)</b>				<b>21</b>	<b>30</b>	<b>--</b>	<b>--</b>	<b>600</b>
<b>Total(Allied -Theory cum Practical)</b>				<b>20</b>				<b>575</b>
11	1	721T	Tamil/other languages – 11	3	6	25	75	100
	11	722E	English – 11	3	6	25	75	100
	111	7B1T2C1	Core – 111 – Programming in C and Data Structures	4	5	25	75	100
		7B1T2P1	Core – 111 – Data Structures using C Lab	4	6	40	60	100
			Allied – 11 (Theory only) (or)	5	5	25	75	100
			Allied – 11 (Theory cum Practical)	4	3	15	60	75
			Allied Practical – 1	2	2	20	30	50
111	7BES2	(3) Environmental Studies	2	2	25	75	100	
<b>Total(Allied -Theory only)</b>				<b>21</b>	<b>30</b>	<b>--</b>	<b>--</b>	<b>600</b>
<b>Total(Allied -Theory cum Practical)</b>				<b>22</b>				<b>625</b>
111	1	731T	Tamil/other languages – 111	3	6	25	75	100
	11	732E	English – 111	3	6	25	75	100
	111	7B1T3C1	Core – 111 – Java Programming	4	5	25	75	100
		7B1T3P1	Core – 111 – Java Programming Lab	4	5	40	60	100
			Allied – 111 (Theory only) (or)	5	5	25	75	100
			Allied – 111 (Theory cum Practical)	4	3	15	60	75
		Allied Practical – 11	--	2**	--	--	--	

	7U	7NME3A / 7NME3B / 7NME3C	(1) <b>Non-major Elective-7U –</b> (A) ,yf:fpakK; nkhopg;gad;ghLk;/ (B)goe;jkpo; ,yf:fpaq:fSk; ,yf:fpatuyhWk;/ (C)Effective Employability skills	2	1	25	75	100	
		7SBS3A1/ 7SBS3A2/ 7SBS3A3	(2) <b>Skill Based Subjects – 7</b>	2	2	25	75	100	
	U	7BEA3	<b>Extension activities</b>	1	-	100	--	100	
<b>Total(Allied -Theory only)</b>				<b>24</b>	<b>30</b>	--	--	<b>800</b>	
<b>Total(Allied -Theory cum Practical)</b>				<b>23</b>				<b>775</b>	
7U	7	741T	<b>Tamil/other languages – 7U</b>	3	6	25	75	100	
	77	742E	<b>English – 7U</b>	3	6	25	75	100	
	777	7B7T4C1	<b>Core – 777 – Open source Software</b>	4	4	25	75	100	
		7B7T4P1	<b>Core – 7777 – Open Source Lab</b>	4	5	<b>40</b>	<b>60</b>	100	
			<b>Allied – 7U (Theory only) (or)</b> <b>Allied – 7U (Theory cum Practical)</b>	5 4	5 3	25 15	75 60	100 75	
			<b>Allied Practical – 77</b>	2	2	20	30	50	
	7U	7SBS4B1 / 7SBS4B2 / 7SBS4B3	(2) <b>Skill Based Subjects – 77</b>	2	2	25	75	100	
		7BU4 / 7BMY4 / 7BUS4	(4) <b>Value Education /Manavalakalai Yoga / Women’s Studies</b>	2	2	25	75	100	
	<b>Total(Allied -Theory only)</b>				<b>23</b>	<b>30</b>	--	--	<b>700</b>
	<b>Total(Allied -Theory cum Practical)</b>				<b>24</b>				<b>725</b>
U	777	7B7T5C1	<b>Core – 7X – Database Management Systems</b>	4	5	25	75	100	
		7B7T5C2	<b>Core – X – Visual Programming</b>	4	5	25	75	100	
		7B7T5P1	<b>Core–X1– Visual Programming Lab</b>	4	6	<b>40</b>	<b>60</b>	100	
		7B7TE1A/ 7B7TE1B	<b>Elective – 7 – A) Design and Analysis of Algorithms (or) B) Computer Graphics</b>	5	5	25	75	100	
		7B7TE2A / 7B7TE2B /	<b>Elective–77– A)Computer Networks (or) B) Security in Computing</b>	5	5	25	75	100	
	7U	7SBS5A4/ 7SBS5A5/ 7SBS5A6/ 7SBS5A7	(2) <b>Skill Based Subjects – 7</b> (2) <b>Skill Based Subjects – 7</b>	2 2	2 2	25 25	75 75	100 100	
		<b>Total</b>			<b>26</b>	<b>30</b>	--	--	<b>700</b>
U7		7B7T6C1	<b>Core – X77 – Software Engineering</b>	4	5	25	75	100	

111	7B1T6C2	<b>Core – XII – Operating System and System Software</b>	4	5	25	75	100
	7B1T6C3	<b>Core – XII – Principles of Multimedia</b>	4	5	25	75	100
	7B1T6PR	<b>Core – XU – Project</b>	4	6	<b>40</b>	<b>60</b>	100
	7B1TE3A / 7B1TE3B	<b>Elective – 111- A) Mobile Communication (or) B) E-Commerce</b>	5	5	25	75	100
110	7SBS6B4 / 7SBS6B5 / 7SBS6B6 / 7SBS6B7	<b>(2) Skill Based Subjects – 11</b>	2	2	25	75	100
		<b>(2) Skill Based Subjects – 11</b>	2	2	25	75	100
<b>Total</b>			<b>25</b>	<b>30</b>	--	--	<b>700</b>
<b>Grand Total</b>			<b>140</b>	<b>180</b>	--	--	<b>4100</b>

**\*\* University Examinations will be held in the Even Semesters only.**

## **B.Sc. INFORMATION TECHNOLOGY**

**1 YEAR – 1 SEMESTER  
COURSE CODE: 7BIT1C1**

### **CORE COURSE- 1 – PRINCIPLES OF INFORMATION TECHNOLOGY**

#### **Unit - 1**

*An overview of Revolution in computers and communications: From the analog to the digital age: The “New Story” of computers and communications – The six elements of a computer and communication system – Communication: Development in Computer Technology, Developments in communication technology – Computer and communications Technology combined: Connectivity and interactivity The Ethics of information technology.*

#### **Unit - 11**

*Application software: Tools for thinking and working – Ethics and intellectual property Rights: The four types of application software – The user interface and other basic user features – Word Processing – Spreadsheets – Database Software – Presentation Graphics Software– Communications Software– Desktop accessories and personal information managers integrated software and studies – Groupware – Internet WEB browsers – Specialized Software.*

#### **Unit - 111**

*Communications: Stating along with the information highway: The Practical uses of communications and connectivity– Telephone related communication services – Video/ Voice communication: Video conferencing and picture phones – online information services – The internet – Shared Resources: Workgroup Computing, Electronic Data Interchange and intranets: Telecomputing and virtual offices – Using a microcomputer to communicate: Analog and Digital Signals – Modems and Datacomm Software, ISDN Lines and Cable Modems – Communications Channels: communications networks – Local Networks*

#### **Unit - 1111**

*Storage and Databases: Foundations for interactivity, Multimedia and knowledge Storage Capacity– Compression and Decompression – Criteria for rating Secondary Storage Devices– Diskettes – Hard Disks – Optical Disks – Magnetic Tapes – Organizing Data in Secondary storage: Databases, Data Storage – Hierarchy and concept of the key field – File management: Basic Concepts – File Management systems – Data management systems – Types of database organization.*

#### **Unit - 11111**

*Information systems and Software Development: Management Information Systems – The Six Phases of System Analysis and Design – The five Steps in programming – The Five Generations of Programming Languages – Programming Languages – Object oriented and visual Programming – Internet Programming*

#### **Text Books:**

1. Stacey C Sawyer, Brian K Williams, Sarah E Hutchinson Using Information Technology – Brief Version A Practical Introduction to Computer and Communications Second Edition, The McGraw Hill Companies Unit 1 to 11.2009
2. Stacey C Sawyer, Brian K Williams, Sarah E Hutchinson Using Information Technology – Brief Version A Practical Introduction to Computer and

**Book for Reference:**

1. J Hames O'Brien – Introduction to Information systems.



**1 YEAR – 1 SEMESTER**

**COURSE CODE: 7B1T1P1**

**CORE COURSE- 11 – OFFICE AUTOMATION LAB**

**MS-WORD**

1. Working with Files – Creating and opening documents, Saving documents, Renaming documents, working on multiple documents.
2. Working with Text – Formatting, Moving, copying and pasting text
3. Styles – Apply a style, Apply from the Style dialog box, Create a new style from a model, Modify or rename a style, Delete style.
4. Lists – Bulleted and numbered lists, Nested lists, Formatting lists
5. Table Manipulations.
6. Graphics – Adding clip Art, Add an image from a file, Editing graphics
7. Spelling and Grammar, AutoCorrect
8. Page formatting–Page margins, page size and orientation, Header and footers, page numbers
9. Mail Merge.
10. Macros – Recording a macro, Running a macro
11. Web wizard – Using the Web Wizard, Creating & Saving web pages, Hyper links.

**MS-EXCEL**

1. Modifying a Worksheet – Moving through cells, Adding worksheets, rows and columns, Resizing rows and columns, Selecting cells, Moving and copying cells, Freezing panes
2. Macros – recording and running.
3. Formatting cells – Formatting toolbar, Dates and times, Auto formatting.
4. Formula and Functions.
5. Linking worksheets – Relative, absolute and mixed referencing
6. Sorting and Filling – Basic ascending and descending sorted, Complex sorts, Alternating text and numbers with Auto fill, Autofilling functions.
7. Graphics – Adding clip art, add an image from a file
8. Charts – Using chart Wizard, Copy a chart to Microsoft Word

**MS-POWER POINT**

1. Create a Presentation from a template.
2. Working with Slides – Insert a new slide, Applying a design template, Changing slide layouts, Reordering slides, Hide slides, Create a Custom slide show 7 edit.
3. Adding Content – Resizing a text box, Text box properties, Delete a text box.
4. Video and Audio effects.
5. Color Schemes & Backgrounds
6. Adding clip art, Adding an image from a file
7. Save as a web page.

**MS-ACCESS**

1. *Using Access database wizard, pages and projects.*
2. *Open an existing database, converting to Access 2000*
3. *Screen Layouts – Database window, Design view, Datasheet view*
4. *Creating Tables – Create a Table in design view, Primary key, Indexes, Field validation rules.*
5. *Datasheet Records – Adding, Editing, Deleting records, Adding and deleting columns & Resizing rows and columns, Finding data in a table & replacing, Print a datasheet.*
6. *Declaring Table Relationships.*
7. *Sorting and Filtering – Sorting, Filter by selection, by form, saving & removing a filter.*
8. *Queries – Create a query in design view, Query Wizard, Find duplicates query, Delete*
9. *Forms – Create a form using the wizard, Create a form in Design View.*
10. *Form Controls.*
11. *Sub forms-Create a form and sub form at once, Sub form wizard, Drag and drop method.*
12. *Reports – Using the wizard, Create in Design View, Printing reports.*
13. *Importing, Exporting, Linking.*



**1 YEAR – 11 SEMESTER  
COURSE CODE: 7BT2C1**

**CORE COURSE- 111 – PROGRAMMING IN C AND DATA STRUCTURES**

**Unit – 1**

Introduction to C – Character set – Identifiers and keywords – Data types – constants – Variables – declarations – Operator and Expressions – Data input, output and control statements: Preliminaries – single character input and output – Entering input data – Writing output data – gets and puts functions – Branching and looping – Nested control structures – Switch – Break – Continue and Goto – Function: defining a function – Accessing a function – Passing arguments to a function – Recursion – Library function – Macros – C preprocessor – Program structure: Storage classes – Automatic variables – Global variables – Static variables– Multiple programming – Bitwise operation.

**Unit – 11**

Arrays: defining and processing an array – Passing on array to functions – Multidimensional arrays – arrays and strings. Pointers: Fundamentals – declarations – passing pointers to functions – usage in single dimensional and multi-dimensional arrays – Dynamic memory allocation – operations on pointers – arrays of pointers – passing functions to other functions.

**Unit – 111**

Structures and Unions: defining a structure – Processing a structure – Structures and pointers– Passing structures to functions – Self referential structures – Bit fields – Unions – Enumerations. Data file: Opening and Closing a data file – Creating a data file – Processing a data file – Unformatted data file – Command line parameters.

**Unit – 11U**

Stack: Definition and Examples – Representing stacks in C – An example: Infix, Postfix and Prefix. Queues and Lists: The queues and Sequential representation–Linked lists – Lists in C.

**Unit – U**

Trees: Binary trees – Binary tree Representations – Representing Lists and Binary Trees – trees and their applications.

**Text Books:**

1. Theory and Problems of programming with C, by Byron S.Gottfried, TATA McGRAW HILL.
2. Data Structures Using C, by Aaron M. Tenenbaum, Yedidyah Langsam, Moshe J.Augenstein, Low Price Edition, PEARSON Education.(Chapter 2, 4, 5)

**Books for Reference:**

1. Programming in ANSI-C, by E. Balagurusamy, TATA McGRAW HILL.
2. Fundamentals of Data Structure by Ellis Horowitz, Sartaj sahnia, Galgotia Publications.

3. *Data Structures and Algorithm Analysis in C, by Mark Allen Weiss, Low Price Edition, PEARSON Education.*





**1 YEAR – 11 SEMESTER  
COURSE CODE: 7B1T2P1**

**CORE COURSE - 11 – DATA STRUCTURES USING C LAB**

1. Write a program to find the sum of individual digits of a positive integer
2. A Fibonacci Sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence
3. Write a C program to generate the first n terms of the sequence
4. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user
5. Write a C program to calculate the following Sum:  
$$\text{Sum} = 1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10!$$
6. Write a C program to find the roots of a quadratic equation
7. Write C programs that use both recursive and non-recursive functions
  - i) To find the factorial of a given integer
  - ii) To find the GCD (greatest common divisor) of two given integers
  - iii) To solve Towers of Hanoi problem
8. Write a C program to find both the largest and smallest number in a list of integers
9. Write a C program that uses functions to perform the following:
  - i) Addition of Two Matrices
  - ii) Multiplication of Two Matrices
10. Write a C program that uses functions to perform the following operations:
  - i) To insert a sub-string in to given main string from a given position
  - ii) To delete n Characters from a given position in a given string
11. Write a C program to determine if the given string is a palindrome or not
12. Write a C program to count the lines, words and characters in a given text
13. Write a C program to generate Pascal's triangle
14. Write a C program to construct a pyramid of numbers
15. Write a C program to read two numbers, x and n, and then compute the sum of this geometric progression:  
$$1 + x + x^2 + x^3 + \dots + x^n$$

For example: if n is 3 and x is 5, then the program computes  $1 + 5 + 25 + 125$

Print x, n, the sum

16. Write a C program that uses functions to perform the following operations:
  - i) Reading a complex number
  - ii) Writing a complex number
  - iii) Addition of two complex numbers
  - iv) Multiplication of two complex numbers(Note: represent complex number using a structure)
17. Write a C program which copies one file to another
18. Write a C program to reverse the first n characters in a file  
(Note: The file name and n are specified on the command line)

19. Write a C program that uses functions to perform the following operations on singly linked list:
- Creation
  - Insertion
  - Deletion
  - Traversal
20. Write a C program that uses functions to perform the following operations on doubly linked list:
- Creation
  - Insertion
  - Deletion
  - Traversal
21. Write C programs that implement stack (its operations) using
- Arrays
  - Pointers
22. Write C programs that implement Queue (its operations) using
- Arrays
  - Pointers
23. Write a C program that uses Stack operations to perform the following:
- Converting infix expression into postfix expression
  - Evaluating the postfix expression
24. Write C programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers:
- Linear search
  - Binary search
25. Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
- Bubble sort
  - Quick sort
  - Insertion sort
  - Merge sort



**11 YEAR – 111 SEMESTER**

**COURSE CODE: 7BIT3C1**

**CORE COURSE - V- JAVA PROGRAMMING**

**Unit – 1**

**Fundamentals of Object Oriented Programming**

Introduction – Object Oriented Paradigm – Basic Concepts of OOP – Benefits of OOP – Applications of OOP.

**Java Evolution**

Java History – Java Features – Java and Internet – World Wide Web–Web Browsers – H/W and S/W requirements – Java Support Systems – Java Environment.

**Overview of Java language**

Introduction – Simple Java Program – Comments – Java Program Structure–Tokens – Java Statements – Implementing a Java Program – JVM – Command Line Arguments.

Constants – Variables – Data Types – Type Casting.

**Unit - 11**

**Operators and Expressions**

Arithmetic Operators – Relational, Logical, Assignment, Increment and Decrement, Conditional, Bitwise, Special Operators – Arithmetic expressions, Evaluation of expression – Precedence of Arithmetic Operators – Type Conversions – Operator Precedence and associativity – Mathematical Functions.

**Decision Making and Branching**

If – if.....else – Nesting of if..... Else – else if – switch - ?: operator.

**Decision Making and Looping**

While – do – for – jump in loops – labeled loops.

**Unit - 111**

**Classes, Objects and Methods**

Defining a class – Adding variables, methods – Creating objects – Accessing Class Members– Constructors – Methods overloading – static members – Nesting of Methods – Inheritance – Overriding methods – final Variables and methods – Final classes – 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

**Interfaces: Multiple Inheritance**

Defining interfaces – Extending interfaces – implementing interfaces – Accessing interface variables.

## **Unit – IV**

### **Packages**

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**

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

### **Managing Errors and Exceptions**

Types of errors – Exceptions – Syntax of Exception handling code – Multiple Catch Statements – Using finally statement – Throwing our own Exceptions – Using Exceptions for Debugging.

## **Unit – V**

### **Applet Programming**

How applets differ from Applications – preparing to write applets – Building Applet Code – Applet life cycle – creating an Executable Applet – Designing a Web Page – Applet Tag – Adding Applet to HTML file – Running the Applet – Passing parameters to Applets – Displaying Numerical values – Getting input from the user

### **Graphics Programming**

The Graphics Class – Lines and Rectangles – Circles and Ellipses – Drawing Arcs – Drawing Polygons – Line Graphs – Using Control Loops in Applets – Drawing Bar Charts.

### **Text Book:**

- 1) **“Programming with JAVA”, Second Edition 2006”, E. Balagurusamy, TATA McGraw–Hill Publishing Company Limited, New Delhi**

UNIT I	Chapters	: 1, 2, 3, 4
UNIT II	Chapters	: 5, 6, 7
UNIT III	Chapters	: 8, 9, 10
UNIT IV	Chapters	: 11, 12, 13
UNIT V	Chapters	: 14, 15

### **Books for Reference:**

- 1) **“Java 2 – The Complete Reference”, Fifth Edition, 2006 Herbert Schildt, TATA Mc Graw Hill Publishing Company Limited, New Delhi.**
- 2) **“Java – How to Program”, Sixth Edition 2005, H.M. Deitel, P.J. Deitel, Pearson Education Pvt. Ltd, Delhi.**





**11 YEAR – 111 SEMESTER  
COURSE CODE: 7B1T3P1**

**CORE COURSE- V1 – JAVA PROGRAMMING LAB**

1. WAP to find greatest of three numbers
2. WAP to calculate factorial of a number using command line arguments
3. WAP to read a set of numbers in an array & to find the sum and average of them
4. WAP to maintain the student record containing roll number, Name, Marks1, Marks2, Marks3 as data member and getdata(), display() and setdata() as member functions
5. WAP to increment the employee salaries on the basis of there designation (Manager – 5000, General Manager – 10000, CEO – 20000, worker – 2000). Use employee name, id, designation, salary as data member and inc\_sal as member function
6. Write a class bank, containing data member: Name of the Depositor, A/c type, Type of A/c, Balance amount. Member function: To assign initial value, To deposit an amount, to withdraw an amount after checking the balance (which should be greater than Rs.500), To display name & balance
7. Design three classes: Student, Exam and Result. The student class has data members such as roll no, name etc. Create a class Exam by inheriting the Student class. The Exam class adds data members representing the marks scored in six subjects. Derive the Result from class Exam and it has its own members such as total marks and average. Calculate the total marks and average
8. Calculate area of different geometrical figures (circle, rectangle, square, triangle) using function overloading
9. Create a class Employee. Derive 3 classes from this class namely, Programmer, Analyst & Project Leader. Take attributes and operations on your own
10. WAP to implement multiple Inheritance using Interface
11. WAP to create Student class in package1 and Marks class in package2 which inherit Student class. Calculate the total and average of marks in Result class
12. WAP to handle ArithmeticException and ArrayIndexOutOfBoundsException
13. WAP to create and handle your own Exception
14. WAP to create a Thread by extending Thread class
15. WAP to create a Thread by implementing Runnable interface
16. WAP to read a number from keyboard using BufferedReader classes & to find out whether the number is prime or not
17. WAP to design a simple Applet and show it within web browser
18. WAP to design a Frame
19. WAP to demonstrate even handler: key and mouse
20. WAP to design the interface of calculator using Grid Layout



**11 YEAR – 11 SEMESTER  
COURSE CODE: 7B114C1**

**CORE COURSE - 111-OPEN SOURCE SOFTWARE**

**Unit - 1 INTRODUCTION**

Introduction to Open sources – Need of Open Sources – Advantages of Open Sources – Application of Open Sources. Open source operating systems: LINUX: Introduction – General Overview – Kernel Mode and user mode – Process – Advanced Concepts – Scheduling – Personalities – Cloning – Signals – Development with Linux. .

**Unit - 11 OPEN SOURCE DATABASE**

MySQL: Introduction Setting up account Starting, terminating and writing your own SQL programs – Record selection Technology – Working with strings – Date and Time – Sorting Query Results – Generating Summary – Working with metadata – Using sequences – MySQL and Web.

**Unit - 111 OPEN SOURCE PROGRAMMING LANGUAGES**

PHP: Introduction – Programming in web environment – variables – constants – data types – operators – Statements – Functions – Arrays – OOP – String Manipulation and regular expression – File handling and data storage – PHP and SQL database – PHP and LDAP – PHP Connectivity – Sending and receiving E-mails – Debugging and error handling – Security – Templates.

**Unit - 112 PYTHON**

Syntax and Style – Python Objects – Numbers – Sequences – Strings – Lists and Tuples – Dictionaries – Conditionals and Loops – Files – Input and Output – Errors and Exceptions – Functions – Modules – Classes and OOP – Execution Environment.

**Unit - 113 PERL**

Perl background – Perl overview – Perl parsing rules – Variables and Data – Statements and Control structures – Subroutines, Packages, and Modules – Working with Files – Data Manipulation.

**Text Books:**

1. Remy Card, Eric Dumas and Frank Mevel, "The Linux Kernel Book", Wiley Publications, 2003
2. Steve Suchring, "MySQL Bible", John Wiley, 2002

**Books for Reference:**

1. Rasmus Lerdorf and Levin Tatroe, "Programming PHP", O'Reilly, 2002
2. Wesley J. Chun, "Core Python Programming", Prentice Hall, 2001
3. Martin C. Brown, "Perl: The Complete Reference", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.
4. Steven Holzner, "PHP: The Complete Reference", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.

5. Vikram Vaswani, "MySQL: The Complete Reference", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.



**11 YEAR – IV SEMESTER  
COURSE CODE: 7B1T4P1**

**CORE COURSE - VII- OPEN SOURCE LAB**

1. Kernel configuration, compilation and installation.
2. Install various software on Linux.
3. Install and configure XAMP.
4. Create a MySQL database and table.
5. Write a MySQL statement to insert a record into the table.
6. Write a MySQL statement to update the values.
7. Write a PHP program to perform the arithmetic operation.
8. Write a PHP program Adding numbers using function.
9. Write a PHP program to generate 10 Random Numbers Using Loop.
10. Write a perl program to check whether the given no is ODD or EVEN.
11. Write a perl program to check whether a number is palindrome or not.
12. Write a python program to find the largest among three numbers.
13. Write a python program to find sum of digits of a number.
14. Write a python program to find the reverse number.
15. Connect to a MySQL database with php, perl and python.





**111 YEAR – V SEMESTER  
COURSE CODE: 7B115C1**

**CORE COURSE- IX – DATABASE MANAGEMENT SYSTEMS**

**Unit - 1**

**Introduction:** Database System Applications – Purpose of Database Systems – View of Data– Database Languages – Relational Databases – Database Design – Object based and semi structured databases – Data storage and Querying – Database Users and Administrators– Transaction Management – Database users and Architectures – History of Database System.

**Entity-Relationship Model:** E-R model – constraints – E-R diagrams – E-R design issues – weak entity sets – Extended E-R features.

**Unit - 11**

**Relational Database Design:** Features of good Relational designs – Atomic domains and First Normal Form – Decomposition using functional dependencies – Functional dependency theory – Decomposition using functional – Decomposition using multivalued dependencies – more Normal forms – Database design process – Modeling temporal data

**Unit - 111**

**Database System Architecture:** Centralized and Client-Server architecture – Server system architecture – Parallel systems – Distributed systems – Network types. Parallel databases: I/O parallelism – Interquery Parallelism – Intraquery parallelism.

**Distributed Databases:** Homogeneous and Heterogeneous databases – Distributed Data storage – Distributed transactions – Distributed query processing.

**Unit - 111**

**Schema Objects:** Data Integrity – Creating and Maintaining Tables – Indexes – Sequences – Views – Users Privileges and Roles – Synonyms.

**Unit - 11**

**PL/SQL:** PL/SQL – Triggers – Stored Procedures and Functions – Package – Cursors – Transactions

**Text Books:**

1. Database System Concepts – Silberschatz, Korth Sudarshan, International (5<sup>th</sup> Edition) McGraw Hill Higher Education 2006.
2. Jose A. Ramalho – Learn ORACLE 8i BPB Publications 2003

**Books for Reference:**

1. “Oracle 9i The complete reference“, Kevin Loney and George Koch, Tata McGraw Hill, 2004.
2. “Database Management Systems“, Ramakrishnan and Gehrke, McGraw Hill, Third Edition, 2003.
3. “Oracle 9i PL/SQL Programming “Scott Urman, Oracle Press, Tata McGraw Hill, 2002.



**111 YEAR – V SEMESTER  
COURSE CODE: 7BT5C2**

**CORE COURSE - X - VISUAL PROGRAMMING**

**Unit – 1**

*Introduction to .NET – The .NET Framework – Benefits of .NET – Common Language Runtime – Features of CLR – Compilation and MSIL – The .NET Framework libraries – The Visual Studio Integrated Development Environment.*

**Unit – 11**

*Introduction to VB.NET – VB.NET fundamentals – Branching and Looping Statements – Classes and Objects – Constructors – Overloading- Inheritance and Polymorphism – Interfaces – Arrays – Strings – Exceptions – Delegates and Events.*

**Unit – 111**

*Building Windows Applications – Creating a Windows Applications using window controls – Windows Forms – Text Boxes – Rich Text boxes – Labels and link labels – Buttons – Check boxes – Radio buttons – Panels and Group Boxes – List Boxes – Checked List boxes – Combo boxes and Picture boxes – Scroll bars – Calendar control – Timer control – Handling Menus – Dialog boxes – Deploying an Application – Graphics.*

**Unit – 111**

*ASP.NET Basics: Features of ASP.NET – ASP.NET Page directives – Building Forms with Web server Controls – Validation Server Controls – Rich Web Controls – Custom Controls – Collections and Lists.*

**Unit – 111**

*Data Management with ADO.NET – Introducing ADO.NET – ADO.NET features – Using SQL Server with VB.NET – Using SQL Server with ASP.NET.*

**Text Books:**

1. Mathew McDonald, “ASP.Net:The Complete Reference”, McGraw-Hill, 2002
2. Steven Holzner, “Visual Basic.NET Programming Black Book”, Dreamtech Press, 2005

**Books for Reference:**

1. Jesse Liberty, “Programming Visual Basic.NET”, Second Edition, O’Reilly, Shroff Publishers and Distributors Pvt. Ltd., 2003
2. Bill Eyjen, Jason Beres, et al., “Visual Basic.NET Programming Bible”, IDG books India(p) Ltd., 2002
3. Mridula Parihar et al., “ASP.NET Bible”, Hungry Minds Inc, 2002
4. Bill Eyjen, Hanselman, Muhammad, Sivakumar & Rader, “Professional ASP.NET 2.0”, Wiley India(p) Ltd., 2006





**1<sup>ST</sup> YEAR – V SEMESTER  
COURSE CODE: 7BT5P1**

**CORE COURSE – XI – VISUAL PROGRAMMING LAB**

1. *Simple application using web controls*
  - a. *Finding factorial Value*
  - b. *Money Conversion*
  - c. *Quadratic Equatin*
  - d. *Temperature Conversion*
  - e. *Login control*
2. *States of ASP.NET Pages*
3. *Adrotator Control*
4. *Calendar control*
  - a. *Display messages in a calendar control*
  - b. *Display vacation in a calendar control*
  - c. *Selected day in a calendar control using style*
  - d. *Difference between two calendar dates*
5. *Treeview control a) Treeview control and datalist b) Treeview operations*
6. *Validation controls*
7. *Query textbox and Displaying records*
8. *Display records by using database*
9. *Datalist link control*
10. *Databinding using dropdownlist control*
11. *Inserting record into a database*
12. *Deleting record into a database*
13. *Databinding using datalist control*
14. *Datalist control templates*
15. *Databinding using datagrid*
16. *Datagrid control template*
17. *Datagrid hyperlink*
18. *Datagrid button column*
19. *Datalist event*
20. *Datagrid paging*
21. *Creating own table format using datagrid*





**1<sup>ST</sup> YEAR – V SEMESTER  
COURSE CODE: 7B1TE1A**

**ELECTIVE COURSE – 1 (A) – DESIGN AND ANALYSIS OF ALGORITHMS**

**Unit – 1**

Introduction – Algorithms– Algorithm Specification– Performance Analysis–  
Stacks and queues: Fundamentals– Evaluation of expressions

**Unit – 11**

Trees: Basic Terminology– Binary Trees– Binary Tree Representations– Binary  
Tree Traversal. Graphs: Terminology and Representations– Traversal.

**Unit – 111**

Linked Lists: Single linked lists– Linked Stacks and queues– Doubly Linked lists–  
Dynamic Programming: The General Method– Multi Stage Graphs– All Pairs Shortest  
Paths– The Travelling Salesman Problem.

**Unit – 110**

Binary search – Depth-first search – Breadth-first search – topological sort –  
Backtracking – Mergesort – finding the closest pair of points – Strassen's matrix  
product algorithm – insertion sort – quicksort – a lower bound for the sorting problem  
– selection

**Unit – 10**

Coin changing – Kruskal's algorithm – Prim's algorithm – Dijkstra's algorithm  
– Huffman codes – The continuous Knapsack problem – computing Fibonacci number  
– multiplying matrices – the longest-common-subsequence problem – Algorithm of  
Floyd and Warshall

**Text Books:**

1. *Algorithms*, Richard Johnsonbaugh and Marcus Schaefer, Pearson Education Pvt Ltd, Delhi, 2004
2. *Fundamentals of Data Structure* by Ellis Horowitz, Sartaj Sahni– Galgotia Publications.
3. *Computer Algorithms* by Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, University Press, second edition 2009

**Books for Reference:**

1. Clifford A. Schaffer, *A Practical introduction to Data structure & Algorithm Analysis*, Prentice Hall of India 1997.
2. Alfred V. Aho, John E. Hopcroft and Jeffery D. Ullman, *Data Structures & Algorithms*, addition Wesley.



**111 YEAR – V SEMESTER  
COURSE CODE: 7B1TE1B**

**ELECTIVE COURSE – 1 (B) – COMPUTER GRAPHICS**

**Unit - 1**

*Introduction: Overview – Brief History – Applications of Computer Graphics – Video Display Generation – Input Devices – Hard Copy output Devices – Graphics System Software– Output Primitives: Point Plotting – Line Draw Algorithms – Using Equation of a line – DDA – Bresenham’s algorithm – Circle Generation Algorithms – Drawing Ellipse*

**Unit - 11**

*Two Dimensional Transformations: Transformation Principles – Basic Transformations – Matrix Representation – Composite Transformations.*

**Unit - 111**

*Two dimensional viewing and Clipping: Viewing Transformations – Windows and viewpoints – Aspect Ratio – Clipping and Shielding: Point Clipping – Line Segment Clipping– Convex polygon clipping – Sitherland Hodgman Algorithm.*

**Unit - 111**

*Three Dimensional Transformations: Concepts – Basic Transformations: Translation, Scaling, Rotation and Mirror Reflection – Matrix Representation – Composite Transformation.*

**Unit - 11**

*User Interface design: Components of User interface – The User’s model – The Command Language – Styles of Command Language – Information Display – Feedback – Examples.*

**Text Books:**

1. M. Newman and F.Sproull, *Interactive Computer Graphics*, McGraw Hill.2010
2. Plastok and Gordon Kalley, *Computer Graphics*, McGraw Hill.2000

**Books for Reference:**

1. Donald Hearn,M.Pauline Baker, *Computer Graphics*, 2<sup>nd</sup> Edition, McGraw Hill 1995
2. Foley Feiner, *Computer Graphics, Principles and Practice* – Addison Wesley.



**III YEAR – V SEMESTER  
COURSE CODE: 7B1TE2A**

**ELECTIVE COURSE – II (A) – COMPUTER NETWORKS**

**Unit - I**

*Introduction: Uses of Computer Networks – Network Hardware and network software – Reference models – Example Networks – Network Standardization – Physical Layer: Transmission Media – Telephone System – ISDN – Broadband and Narrowband ISDN – ISDN and ATM – Communication Satellites.*

**Unit - II**

*Data Link Layer: Design Issues – Error Detection and correction codes – Elementary data link Protocols – Sliding Window Protocols – Protocol Specification and Verification: Finite State models – Petri net models – Media access Sub layer: Multiple access protocols – ALOHA – Carrier Sense multiple Access protocols – Collision free Protocols.*

**Unit - III**

*Network Layer: Design Issues – Routing Algorithms – Congestion Control Algorithms – Internetworking: Tunneling – Fragmentation – Firewalls – Network Layer in the internet – IP- Subnets – Network layer in ATM networks: Cell Format – Connection setup – Routing and switching – Services Categories – ATM LANs.*

**Unit - IV**

*Transport Layer: Transport Service – Elements of Transport Protocols: Addressing – Flow Control and Buffering – Multiplexing – Crash Recovery – Performance issues – Measuring Network performance – Internet Transport Protocols – TCP – UDP – Protocols for Gigabit Networks.*

**Unit - V**

*Application Layer: Network Security – Cryptography – Secret and Public Key Algorithms – DNS – SNMP – Electronic Mail – Electronic Mail Privacy – World Wide Web: Client Side – Server Side – Multimedia – Audio – Video – Data compression – JPEG, MPEG Standards.*

**Text Books:**

1. Andrew S.Tenenbaum, Computer Networks, Third Edition, Prentice Hall of India.2011

**Books for Reference:**

1. Uless Black, Computer Networks, PHI.
2. Data and computer communications, PHI, W.Stallings
3. Data Communication and networking by Behrouz A.Forouzan, Tata McGraw Hill Edition.





**111 YEAR – V SEMESTER  
COURSE CODE: 7B1TE2B**

**ELECTIVE COURSE – 11 (B) – SECURITY IN COMPUTING**

**Unit - 1**

*Introduction: Protecting Valuables - Characteristics of Computer Intrusion - Attacks - Security Goals - Vulnerabilities - Computer Criminals - Methods of Defense - Cryptography: Terminology - Representing Characters - Substitution Ciphers - Transpositions - Data Encryption Standard - AES Encryption Algorithm - Public Key Encryption*

**Unit - 11**

*Program Security: Fixing faults - Unexpected Behavior - Types of Flaws - Non Malicious Program Errors - Viruses and other Malicious code - Targeted Malicious Code - Controls Against Program Threats - Protection in General Purpose Operating System: Protected objects and methods of protection - Memory and Address protection - Control of Access to General objects - File Protection Mechanisms - User Authentication*

**Unit - 111**

*Trusted Operating system: Trusted system - Security policies - Models of Security - Trusted Operating system Design - Database and Data Mining Security - Introduction to Databases - Security Requirements - Reliability and Integrity - Sensitive Data - Data Mining: Privacy and Sensitivity - Data Correctness and Integrity*

**Unit - 111**

*Network Security: Network concepts - Threats in Networks - Network Security controls - Firewalls - Intrusion Detection systems.*

**Unit - 111**

*Privacy in Computing: Privacy concepts- Privacy principles and policies - Authentication and Privacy - Privacy Preserving Data Mining - Privacy on Web - E-Mail security.*

**Text Book:**

1. *Security in Computing - Fourth Edition, Charles P. Pfleeger and Shari Lawrence Pfleeger, Pearson Education Inc., Prentice Hall.*

**Books for Reference:**

1. *Information Security - Second Edition, Mark Rhodes Ousley, Mc Graw Hill Education.*
2. *Computer Security Principles and Practice - Second Edition, William Stallings, Pearson Education.*



**III YEAR – VI SEMESTER  
COURSE CODE: 7B1T6C1**

**CORE COURSE - XII – SOFTWARE ENGINEERING**

**Unit - I**

*Introduction: Introduction to software engineering – Definitions – some size factors – quality and productivity factors – managerial Issues – Planning a software project: Defining the problem – developing a solution strategy – planning the development process – Planning an organizational structure – Other planning activities*

**Unit - II**

*Software Cost Estimation: Software cost factors – Software cost estimation techniques – Estimating software maintenance costs. Software Requirements Definition: The software requirements specification – Formal specification techniques*

**Unit - III**

*Software Design: Fundamental design concepts – Modules and modularization criteria – design notations – Design techniques – Detailed design considerations – Real time and distributed system design – Test plan – milestones, walkthroughs and inspections – Design guidelines – Software Implementation: Structured coding techniques – Coding style – Standards and guidelines*

**Unit - IV**

*Software Testing: A Strategic approach to software testing – Strategic issues – Unit testing – integration testing – validation testing – System testing – The art of debugging  
Software Maintenance – configuration management – Source code metrics – Other maintenance tools and techniques*

**Unit - V**

*Software Quality Assurance: Quality concepts – Software quality assurance – Software reviews – formal technical reviews – Statistical quality assurance – SQA plan – ISO 9000 quality standards*

**Text Book:**

1. *Software Engineering Concepts – Richard E. Fairley, Tata McGraw Hill Publishing Company Ltd, New Delhi (Chapters: 1, 2, 3.1, 3.2, 3.4, 4.1, 4.2, 5, 6.1, 6.2, 6.3, 9)1997*

**Books for Reference:**

1. *Software Engineering – A Practitioner's approach – Roger S. Pressman, (Fourth Edition)McGraw Hill International Editions(Chapters:8.1, 8.3, 8.4, 8.5, 8.7, 8.9, 8.10, 17)*
2. *An Integrated Approach to Software engineering – Pankaj Jalote, Second Edition Narosa Publishing House*
3. *Fundamentals of Software Engineering, Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli, Prentice Hall of India Pvt. Ltd., New Delhi*



**III YEAR – VI SEMESTER  
COURSE CODE: 7BT6C2**

**CORE COURSE - XIII – OPERATING SYSTEM AND SYSTEM SOFTWARE**

**Unit - 1 OPERATING SYSTEMS OVERVIEW**

Computer System Overview - Basic Elements, Instruction Execution, Interrupts, Memory Hierarchy, Cache Memory, Direct Memory Access, Multiprocessor and Multicore Organization. Operating system overview - objectives and functions, Evolution of Operating System - Computer System Organization - Operating System Structure and Operations - System Calls, System Programs, OS Generation and System Boot.

**Unit - II PROCESS MANAGEMENT**

Processes-Process Concept, Process Scheduling, Operations on Processes, Interprocess Communication; Threads- Overview, Multicore Programming, Multithreading Models; Windows 7 - Process Synchronization - Critical Section Problem, Mutex Locks, Semaphores, Monitors; CPU Scheduling and Deadlocks.

**Unit - III STORAGE MANAGEMENT**

Main Memory-Contiguous Memory Allocation, Segmentation, Paging, 32 and 64 bit architecture Examples; Virtual Memory- Demand Paging, Page Replacement, Allocation, Thrashing; Allocating Kernel Memory, OS Examples.

**I/O SYSTEMS**

Mass Storage Structure- Overview, Disk Scheduling and Management; File System Storage-File Concepts, Directory and Disk Structure, Sharing and Protection; File System Implementation- File System Structure, Directory Structure, Allocation Methods, Free Space Management; I/O Systems.

**Unit - IV INTRODUCTION**

System software and machine architecture - The Simplified Instructional Computer (SIC) - Machine architecture - Data and instruction formats - addressing modes - instruction sets - I/O and programming.

**ASSEMBLERS**

Basic assembler functions - A simple SIC assembler - Assembler algorithm and data structures - Machine dependent assembler features - Instruction formats and addressing modes - Program relocation - Machine independent assembler features - Literals - Symbol-defining statements - Expressions - One pass assemblers and Multi pass assemblers

**Unit - V LOADERS AND LINKERS**

Basic loader functions - Design of an Absolute Loader - A Simple Bootstrap Loader - Machine dependent loader features - Relocation - Program Linking - Algorithm and Data Structures for Linking Loader - Machine-independent loader features - Automatic Library Search - Loader Options - Loader design options - Linkage Editors - Dynamic Linking - Bootstrap Loaders - Implementation example -

MSDOS linker.

**Text Books:**

1. Abraham Silberschatz, Peter Baer Galwin and Greg Gagne, "Operating System Concepts", 9<sup>th</sup> Edition, John Wiley and Sons Inc., 2012.
2. Leland L. Beck, "System Software – An Introduction to Systems Programming", 3<sup>rd</sup> Edition, Pearson Education Asia, 2000.

**Books for Reference:**

1. William Stallings, "Operating Systems – Internals and Design Principles", 7th Edition, Prentice Hall, 2011.
2. Andrew S. Tanenbaum, "Modern Operating Systems", Second Edition, Addison Wesley, 2001.
3. D M Dhamdhere, "Operating Systems: A Concept-Based Approach", Second Edition, Tata McGraw-Hill Education, 2007.
4. D. M. Dhamdhere, "Systems Programming and Operating Systems", Second Revised Edition, Tata McGraw- Hill, 1999.





**111 YEAR – VI SEMESTER  
COURSE CODE: 7BIT6C3**

**CORE COURSE – XIV- PRINCIPLES OF MULTIMEDIA**

**Unit – I**

**Introduction**

Objectives – History of Multimedia – Multimedia market – Content and copyright – Resources for Multimedia Developers – Products and Evaluations. Types of products – Evaluation.

**Unit – II**

**Hardware, Operating system and Software**

Computer architecture – Standards – Operating Systems and Software – Multimedia Computer architecture.

**Text**

Elements of Text – Text Data files – Using Text in Multimedia Applications – Hypertext.

**Unit – III**

**Graphics**

Elements of Graphics – Images and Color – Graphics File and Applications formats – obtaining Images for Multimedia use – Using Graphics in Multimedia Applications.

**Digital audio**

Characteristics of Sound and Digital Audio – Digital Audio System – MIDI – Audio File Formats – Using Audio in Multimedia Applications.

**Unit – IV**

**Digital video and animation**

Background on Video – Characteristics of Digital Video – Digital Video Data sizing – Video Capture and Playback Systems – Computer Animation – Using Digital Video in Multimedia Applications

**Product design**

Building Blocks – Classes of Products – Content Organizational Strategies – Storyboarding.

**Unit – V**

**Authoring tools**

Multimedia Tool Selection, Features – Categories of Authoring Tools – Selecting the right authoring paradigm – Strategy for selecting a tool.

**Multimedia and the Internet**

The Internet – HTML and web authoring – Multimedia considerations for the Internet – Design considerations for web pages.

**Text Book:**

1. "Multimedia technology and applications" 2002, David Hillman, Galgotia publications Pvt. Ltd. New Delhi.

**Books for Reference:**

1. "Multimedia making it works", Fifth edition 2002, Tay Vaughan, Tata Mcgraw -Hill publishing company Ltd, New Delhi.



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7<sup>TH</sup> YEAR – VI SEMESTER  
COURSE CODE: 7BIT6PR

**CORE COURSE- XV – PROJECT**

*A maximum of two students can combine and do a project in the subject related to Information Technology with the guidance of a teacher who will be the internal guide. The project has to be submitted to the respective department and evaluated by the internal and external examiner and the marks sent to the university.*

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**111 YEAR – VI SEMESTER  
COURSE CODE: 7B1TE3A**

**ELECTIVE COURSE- 111 (A) – MOBILE COMMUNICATION**

**Unit - 1**

*Introduction – Wireless Transmission – Frequencies for Radio Transmission – Signals – Antennas – Signal propagation – Multiplexing Modulation – Spread Spectrum – Cellular systems.*

**Unit - 11**

*Medium Access Control – Motivation for a specialized MAC – SDMA – FDMA – DDMA – CDMA – Comparison of S/T/F/CDMA.*

*Telecommunication Systems – GSM – DECT – TETRA – UMTS – and IMT – 2000, Satellite systems – GEO 139, LEO 139, MEO 140 – Routing – Localisation – Handover – Broadcast systems – overview, Cyclic Repetition of Data – Digital Audio Broadcasting – Digital Video Broadcasting.*

**Unit - 111**

*Wireless LAN – Infrared Vs Radio Transmission – Infrastructure and AD HOC Networks – IEEE 802.11 – HIPERLAN – Bluetooth.*

*Wireless ATM – Motivation for WATM – Wireless ATM working Group – WATM services– Reference model – Functions – Radio Access layer – Handover – Location management – Addressing – Mobile quality of service – Access pointer control Protocol.*

**Unit - 111**

*Mobile network layer – Mobile IP – Dynamic host configuration protocol – AD HOC networks.*

*Mobile Transport Layer – Traditional TCP 292 – Indirect TCP – Snooping TCP, Mobile TCP– Fast Retransmit / Fast Recovery – Transmission / Timeout Freezing, Selective Retransmission – Transaction Oriented TCP.*

**Unit - 111**

*Support for Mobility – File systems Consistency – World wide Web – Hyper text transfer protocol – Hyper text Markup Language – Approaches that might help wireless access – System Architecture – Wireless Application Protocol.*

**Text Book:**

1. JOCHEN SCHILLER, *Mobile Communications*, Addison Wesley, 2000.

**Book for Reference:**

1. *Programming WAP, WAP Servlets with WML, WML Script and 3G*, by V. K. Jain, Dreamtech Press, 2001.



**III YEAR – VI SEMESTER  
COURSE CODE: 7BITE3B**

**ELECTIVE COURSE - III (B) – E-COMMERCE**

**Unit - 1**

*Electronic Commerce Framework – Electronic Commerce and Media convergence – The anatomy of E-Commerce applications – Electronic commerce consumer applications – Electronic commerce organization applications. Components of the 1-Way – The Internet terminology – History of the Internet – Internet governance: The Internet society – Internet applications*

**Unit - II**

*Architectural framework for electronic commerce – WWW as architecture – Web background Hypertext publishing – Technology behind the web – Security and the Web. Types of Electronic Payment systems – Digital Token Based electronic payment systems – Smart cards and electronic payment systems – Credit card based electronic payment systems – Risks of Electronic payment systems – Designing Electronic payment systems*

**Unit - III**

*Electronic data Interchange – EDI applications in business – EDI: Legal, security and privacy issues – EDI and Electronic commerce. Standardization and EDI – EDI software implementation – EDI envelope and message transport – Value Added Networks (VANs) – Internet Based EDI. Internal information systems*

**Unit - IV**

*The new Age of Information based marketing – Advertising on the internet – Charting the On-line Marketing process – Market Research. Electronic commerce catalogs or directories – Information filtering – consumer – Data interface: Emerging tools*

**Unit - V**

*Computer based education and training – Technological components of education on demand– Digital copyrights and electronic commerce. History of software agents – Characteristics and properties of agents.*

**Text Book:**

1. Ravi Kalakota, Andrew Whinston “Frontiers of Electronic Commerce”.

**Books for Reference:**

1. Jeffrey F. Rayport & Bernard J. Jaworski, “E-Commerce”, TMH
2. Dhruv NATH, The nuts and bolts of E-Commerce, TMH

