

Bachelor of Computer Applications (BCA) Regular

Syllabus & Scheme of Examination – 1st, IInd & IIIrd Year (6 Semesters)

w.e.f. 2015-16

Semester – 1 (w.e.f 2015-16)					
Paper Code	Title of Paper	Max Marks		Pass Marks	Exam Duration
		External	Internal		
	Information Technology Trends	80	20		3 Hrs
	Programming Principles & Algorithm through C	80	20		3 Hrs
	Mathematics	80	20		3 Hrs
	Lab - Office Automation Tool (On GNU Linux)	80	20		3 Hrs
	Lab - Accounting through Tally	80	20		3 Hrs
	Lab - C	80	20		3 Hrs
Semester –2					
	Programming in Python	80	20		3 Hrs
	GNU Linux Operating System	80	20		3 Hrs
	Data Structure	80	20		3 Hrs
	Lab – Python	80	20		3 Hrs
	Lab – Communication Skill	80	20		3 Hrs
	Lab – GNU Linux OS	80	20		3 Hrs
Semester –3 (w.e.f 2016-17)					
	Data Base Management System	80	20		3 Hrs
	Java Programming	80	20		3 Hrs
	Enterprise resource Planning	80	20		3 Hrs
	Lab – SQL	80	20		3 Hrs
	Lab – ERP5	80	20		3 Hrs
	Lab – Java	80	20		3 Hrs
Semester –4					
	Introduction to Web Designing	80	20		3 Hrs
	Computer Graphics	80	20		3 Hrs
	Client Server Technology	80	20		3 Hrs
	Lab – HTML	80	20		3 Hrs
	Lab – Computer Graphics	80	20		3 Hrs
	Lab – Client Server Lab	80	20		3 Hrs
Semester –5					
	VB.Net	80	20		3 Hrs
	PHP Programming	80	20		3 Hrs
	E-Commerce	80	20		3 Hrs
	Lab – VB.Net	80	20		3 Hrs
	Lab- Php	80	20		3 Hrs
	Minor Project (Raspberry Pi2)	80	20		3 Hrs
Semester –6					
	Android Programming	80	20		3 Hrs
	Software Engineering	80	20		3 Hrs
	Cyber Law	80	20		3 Hrs
	Lab – Android Programming	80	20		3 Hrs
	Major Project	160	40		3 Hrs

INFORMATION TECHNOLOGY TRENDS	
UNIT I	Introduction to computer- brief history of development / generation of computers, digital computer system concept, computer system characteristics, capabilities and limitations. Types of computers – analog, digital, hybrid, general, special purpose, micro, mini, mainframe, super. Personal computer (PCs) – configuration of a standard PC, types of PCs – desktop, laptop, notebook, palmtop, workstations etc. – their characteristics.
UNIT II	Data, need of data processing, information and its need, levels of information, quality of information. Comparison of manual and electronic storage of data, organization of data as file, use of information in data processing systems, various data processing methods.
UNIT III	Need and types of software – system software, application software, packages and firmware. Open Source Concepts: Open source software, freeware, shareware, proprietary software. Types of computer languages - machine, assembly, high level, IVGL and object oriented language with merits/demerits and their features. Translators - assembler, compiler, interpreter and their comparison. History and introduction of operating system (Windows and Unix), booting process, file and directory structure.
UNIT IV	Introduction to ports – serial, parallel and USB, Memory Management – concepts of primary/main memory and secondary memory and various storage devices - floppy disk, hard disk, compact disk, DVD, pen drives/thumb drives. Number system - binary, octal, decimal, hexadecimal and their inter conversion.
UNIT V	Principals of data communication and networking - general features and tasks of a communication system, Concept of LAN, MAN and WAN with their advantages and disadvantages. Connecting devices – repeater, switch, router, bridge. Introduction to ecommerce, advantages and growth. Types of viruses and worms, virus detection and prevention, viruses on network, firewalls.

Suggested readings:

- Computer Fundamentals, P K Sinha, BPB Publications.
- IT Tools and Business Systems (DOEACC 'O' Level), Satish Jain, BPB Publications
- Computer fundamentals and information technology, Ramesh Bangia, Firewall Media

FUNDAMENTAL OF C PROGRAMMING	
UNIT I	Concept of programming, algorithms and flowcharts, data types, structure of C program, constants and variables, arithmetic operators, library functions, expressions, input/output statements, compound statements and blocks.
UNIT II	Operators - relational, logical, bit wise, unary, hierarchy of operators. Control statements - if-else, nested if, switch case, goto and labels, looping statements - while, do-while and for, nested loops, break and continue.
UNIT III	Introduction of arrays - one-dimensional and multidimensional arrays, structures – simple and compound, unions, processing a structure. Pointers – declaration, increment and decrement operation, pointer to array, array of pointers, pointers to structures.
UNIT IV	Functions - defining and accessing a function, function arguments, call by value, call by reference, calling functions with arrays, external, state and register variables, scope of variables, local and global variables, type conversion, block structure, recursion.
UNIT V	Introduction of strings, library functions of strings - strlen, strcpy, strcat, strcmp. File handling – file input/output statements, creating, reading, writing and modifying files.

Suggested readings:

- The Complete Reference C, Herbert Schildt, TMH
- Let Us C, Yashavant P. Kanetkar , BPB Publications
- Programming in ANSI C, Balaguruswamy, Mc Graw Hill
- The C Programming language, Ritchie & Kernighan, PHI

	MATHEMATICS
UNIT I	MATRIX ALGEBRA - Matrices, Rank of Matrix, Solving System of Equations- Eigen Values and Eigen Vectors-Inverse of a Matrix - Cayley Hamilton Theorem
UNIT II	BASIC SET THEORY - Basic Definitions - Venn Diagrams and set operations - Laws of set theory - Principle of inclusion and exclusion - partitions- Permutation and Combination - Relations- Properties of relations - Matrices of relations - Closure operations on relations - Functions - injective, subjective and objective functions.
UNIT III	MATHEMATICAL LOGIC - Propositions and logical operators - Truth table - Propositions generated by a set, Equivalence and implication - Basic laws- Some more connectives - Functionally complete set of connectives- Normal forms - Proofs in Propositional calculus - Predicate calculus
UNIT IV	FORMAL LANGUAGES - Languages and Grammars-Phrase Structure Grammar-Classification of Grammars-Pumping Lemma For Regular Languages-Context Free Languages.
UNIT V	FINITE STATE AUTOMATA - Finite State Automata-Deterministic Finite State Automata(DFA), Non Deterministic Finite State Automata (NFA)-Equivalence of DFA and NFA-Equivalence of NFA and Regular Languages

Suggested readings:

- Kenneth H.Rosen, “ Discrete Mathematics and Its Applications”, Tata McGraw Hill, Fourth Edition,2002 (Unit 1,2 & 3).
- Hopcroft and Ullman, “Introduction to Automata Theory, Languages and Computation”, Narosa Publishing House, Delhi, 2002. (Unit 4,5)
- A.Tamilarasi & A.M.Natarajan, “Discrete Mathematics and its Application”, Khanna Publishers, 2nd Edition 2005.
- M.K.Venkataraman “Engineering Mathematics”, Volume II, National Publishing company, 2nd Edition,1989.
- Juraj Hromkovic, “Theoretical Computer Science”, Springer Indian Reprint, 2010.
- David Makinson, “Sets, Logic and Maths for Computing”, Springer Indian Reprint, 2011

	LAB – OFFICE AUTOMATION TOOL (ON GNU LINUX)
	<p>Getting Started – What is Libre Office, Writer (Word Processor), Calc (Spreadsheet), Impress (Presentation), Draw (Vector Graphics), Base (Data Base), Math (Formula Editor)</p> <p>What is Writer, Changing Docs View, Saving a doc, Password Protection, Closing Doc, Choosing option for loading and saving documents, working with text, selecting text, cutting copying, pasting text, formatting text & Paragraph, Auto text Checking Spell Grammar, formatting Pages, Printing, Exporting, Faxing and Emailing, Styles, Working with Graphics, Working with Tables, Templates, Using Mail Merge, TOC's, Indexes, Creating Master Doc</p>
	<p>What is Calc, Spreadsheets, Sheets, Cells, Working with Sheets, Entering, Editing and formatting data, Creating charts and Graphs, Using Styles and templates in calc, Using Graphics in Calc, Printing, Exporting and Emailing, Using Formulas and Functions, Using Pivot Table, using Goal Seek, Linking Calc Data, Sharing and Reviewing Docs etc</p>
	<p>What is Impress, Creating new Presentation, running slide Show, Using Slide Master, Styles and templates, Adding and Formatting Text, Adding & Formatting Pictures, Managing Graphic objects, Formatting Graphic Objects, including Spreadsheet, Charts and other objects, Adding and Formatting Slides, Slide Shows, Printing, Emailing, Exporting,</p>
	<p>Introducing Draw, Drawing Basic Shapes, Working with Objects and object Points, Changing object Attributes, Combining multiple objects, Editing Pictures, Working with 3D Objects Connections, Flowcharts and organizational charts, Adding and formatting text, Printing, Exporting and Emailing</p>
	<p>Introduction to Base, Creating a Database, Tables, Forms, Queries, Reports, Linking to Database, Database Task, Database Maintenance</p>

LAB – ACCOUNTING THROUGH TALLY	
	Basics of Accounting- Types of Accounts, Golden Rules of Accounting, Accounting Principles, Concepts and Conventions, Double Entry System of Book Keeping , Mode of Accounting, Financial Statements, Transaction s, Recording Transactions
	Fundamental of Tally ERP- Getting Functional with Tally ERP , Creation / Setting up of company in Tally ERP, Features, Configuration, Setting up Accounts Head
	Inventory in Tally ERP – Stock Group, Stock Categories, Units of Measure, Stock Items, Creating Inventory Masters,
	Accounting Vouchers, Inventory Vouchers, Invoicing, Bill Wise Details.
	Cost Centers, Cost Categories, Voucher Class and Cost Center Bank Reconciliation etc

- Lab C --- Practical of C Language As per Theory Paper

PROGRAMMING IN PYTHON	
UNIT I	<p>Getting Started: Introduction Of Programming, Languages Usage and Applications with the Open-Source Platform .Introduction to Python, Python Syntax & Style- an integrated high level language, interactive mode and script mode. Data types –Number (Integer - boolean, decimal, octal, hexadecimal; Floating point; Complex), none, Sequence (String,Tuples, List) Sets, Mapping.</p>
UNIT II	<p>Mutable and Immutable Variables</p> <p>Python Objects, Data Types, and Operators .</p> <p>Variables, Expressions and Statements: Values, Variables and keywords; Operators and Operands in Python: (Arithmetic, relational and logical operators), operator precedence, Expressions and Statements (Assignment statement); Taking input (using raw_input() and input()) and displaying output (print statement); Putting Comments.</p>
UNIT III	<p>How to Create Function and Using Method with Python Programming.</p> <p>Functions: Importing Modules (entire module or selected objects), invoking built in functions, functions from math module (for example, ceil, floor, fabs, exp, log, log10, pow, sqrt, cos, sin, tan, degrees, radians), using random() and randint() functions of random module to generate random numbers, composition.</p> <p>Defining functions, invoking functions, passing parameters (default parameter values, keyword arguments), scope of variables, void functions and functions returning values, flow of execution</p> <p>Python Flow Control: Loops and Conditionals ,Files and Input/Output</p> <p>Conditional constructs and looping: if else statement while, for (range function), break, continue, else, pass, nested if, nested loops, use of compound expression in conditional and looping construct.</p>
UNIT IV	<p>Strings: Creating, initialising and accessing the elements; string operators: +, *, in, not in, range slice [n:m]; comparing strings using relational operators; String functions & methods: len, capitalize, find, isalnum, isalpha, isdigit, lower, islower, isupper, upper, lstrip, rstrip, isspace, istitle, partition, replace, join, split, count, decode, encode, swapcase, String constants, Regular Expressions and Pattern Matching</p>

UNIT V	<p>Lists: Concept of mutable lists, creating, initializing and accessing the elements, traversing, appending, updating and deleting elements, composition, lists as arguments</p> <p>List operations: joining, slicing, + , * , in , not in</p> <p>List functions and methods: len(), insert(), append(), extend(), sort(), remove(), reverse(), pop(), list(), count(), extend(), index(), cmp(), max(), min()</p> <p>Dictionaries: Concept of key-value pair, creating, initialising and accessing the elements in a dictionary, traversing, appending updating and deleting elements</p> <p>Dictionary Functions and methods: cmp(), len(), clear(), get(), has_key(), items(), key(), update(), values(), pop(), fromkeys(), dict()</p> <p>Tuples: Immutable concept, creating, initialising and accessing elements in a tuple, Tuple assignment, Tuple slices, Tuple indexing,</p> <p>Tuple Functions: cmp(), len(), max(), min(), tuple(), index(), count(), sum(), any(), all(), sorted(), reversed()</p> <ul style="list-style-type: none"> - How to import Modules and packages with the Python - How to handle Errors and Exceptions. - Python Execution Environment. - Using Regular Expressions in Python
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--Suggested readings:

- Python programming for Beginners By Jason Cannon Publisher: Create Space Independent Publishing Platform

GNU LINUX OPERATING SYSTEM	
UNIT I	Introduction to the Concept of Open Source Software, GNU Linux Overview, History of GNU Linux, GNU Linux distributions, architecture, GNU Linux file system (inode, Super block, Mounting and Unmounting) , Kernel , Introduction to GNU Linux Processes and System calls .
UNIT II	Introduction to Shell, Various shells, shell customization, vi editor, GNU Linux files and the file structure, listing, displaying and printing files, managing directories, File and Directory operations, Essential GNU Linux commands, Internal and External commands, Archiving and compressing files.
UNIT III	I/O redirection and Piping, Simple filter commands – grep, head, tail, cut, paste, sort, uniq. Processes : background process, premature termination of process, process priorities, process scheduling, nohup command. Compiling C Programs in GNU Linux Environment
UNIT IV	Shell programming: Interactive scripts. shell variables, assigning values to variables, positional parameters, command line arguments, arithmetic in shell script, exit status of a command. sleep and wait, script termination, Taking decisions, Loop Control Structure, Shell Metacharacters,Shell Miscellany
UNIT V	File Ownerships and access permissions, changing permissions and ownerships, User and its Home directory, Booting and Shutting down, Boot Loaders, LILO, GRUB, Bootstrapping, init Process, System services, init and run levels

Suggested readings

- Richard Mathews, GNU Linux the Complete Reference ,(TMH).
- Yashwant Kanetkar, Unix shell programming,(BPB).
- Sumintabha Das ,Unix Systems V 4 Concepts & Applications .
- Maurice J.Bach, Design of the Unix Operating System ,(Pearson Education).

DATA STRUCTURE	
UNIT I	Elementary data structure: Data types, Arrays and their representation, records and record structures. Linked lists: Representation of linked list in memory, insertion, deletion and searching of linked list, circular linked list, doubly linked list,
UNIT II	Stacks: Definition, array and linked implementation , operations on stack, application of stack, arithmetic expressions and recursion, prefix and postfix notations, evaluation of polish notation using stack. Queues: Queue data structure, implementation, operation on queues, operations on circular queue, priority queues.
UNIT III	Trees: Concept and terminology, Binary trees, linear and linked representation of binary trees, binary search tree, insertion and deletion operations on a binary search tree, Tree traversal techniques- In order, Preorder, Post order traversal and their recursive algorithms.
UNIT IV	Graphs and their representations, adjacency matrix, path matrix, graph traversal, breadth first search and depth first search algorithms.
UNIT V	Sorting and Searching: Sequential, Binary Search, Internal and external sorting techniques, Bubble sort, Insertion sort, Selection sort, Merge sort and quick sort algorithms.

Suggested readings:

- Data Structures, S. Lipschutz, Mc Graw Hill International Edition
- Fundamentals of computer algorithm , Horowitz, Sahni, RSajasekaran, Galgotia Publications
- Data Structures and Algorithms, A.V. Aho., J.E. Hopcroft, and J.D. Ullman, Pearson Education Asia.
- Data Structures Using C, Tanenbaum, Pearson Education

Lab Python --- Practical of Python Language As per Theory Paper

COMMUNICATION SKILL	
UNIT I	Types of communications- oral communication, written communication – formal, informal
UNIT II	business letters – types of letter, writing letters, business correspondence
UNIT III	Applying for a job, resume writing, filling an employment application.
UNIT IV	Report writing – definition and determining reports purpose, report planning, collecting information, developing an outline,
UNIT V	Sections of report, types of report, making reports writing effective, drafting circulars, notices. Agenda and minutes of meetings.

- Lab GNU Linux OS --- Practical of GNU Linux OS As per Theory Paper

DATABASE MANAGEMENT SYSTEM	
UNIT I	Introduction to Database: Need for DBMS, advantages of DBMS, views of data, instances and schema data independence, database administrator, database manager, database languages, overall structure of DBMS.
UNIT II	Entity Relationship Model: Entities, attributes, relationship, constraints, keys, E-R diagram. Concept of strong and weak entity sets, generalization, specialization and aggregation.
UNIT III	Relational Model : Structure of Relational Databases, Relational Databases, Modification of the Databases, Tuple Relational Calculus, Domain Relational Calculus.
UNIT IV	SQL – Basic structure – Clauses, data types, creating tables. Modification of the database – deletion, insertion, updates. Retrieving data from tables, ordering, set operations – union, intersect, except, concept of NULL values, nested subqueries – set membership, set comparison, exist and not exist operator, unique, not unique construct.
UNIT V	Joins, equi-joins, non-equi-joins, self joins, outer joins. Aggregate functions – group by and having clause. Math functions, string functions, group by clause. Indexes, views, granting and revoking permissions.

Suggested readings

- Database Concepts, Korth, Silbertz, Sudarshan, McGraw Hill
- Fundamentals of Database Systems, Elmasri, Navathe, Addison Wesley
- An Introduction To Database System, Date C J, Addison Wesley
- An introduction to Database Systems, Bipin C. Desai, Galgotia Publication
- Database Management System, Ramakrishnan, Gehrke, McGraw Hill

JAVA PROGRAMMING	
UNIT I	Object Oriented Concepts in Java, Comparison of Java and C++, Java features like security, portability, byte code, java virtual machine, object oriented, robust, multithreading, architectural neutral, distributed and dynamic. Java Source File Structure, Compilation, Execution, Difference between application and applet.
UNIT II	Class Fundamentals, Object & Object reference, Creating and Operating Objects, Use of Tokens, Identifiers, Keywords, Literals, Comments, Primitive Datatypes, Operators-precedence and associativity, Type conversion, Command line argument, accepting input from keyboard, decision making – if, if..Else, switch; loops – for, while, do...while; special statements–return, break, continue.
UNIT III	Object Life time & Garbage Collection, Constructors, Access Modifiers, Abstract Class, Interfaces, Implementing Interfaces, Defining Methods, Argument Passing Mechanism, Method Overloading, Recursion, Static Members, Finalize() Method, Use of this keyword, Array – single and two dimension array.
UNIT IV	Inheritance – Advantages of Inheritance in OOP, types of Inheritance, constructors in inheritance, use of super keyword, polymorphism; Interfaces - defining an interface, implementing and applying interfaces, using variables in interfaces, extending interfaces; Method overriding – use, need, advantage.
UNIT V	Package - Organizing Classes and Interfaces in Packages, Package as Access Protection, defining Package, CLASSPATH Setting for Packages and Naming Convention for packages. Applets, Applet security restrictions, the class hierarchy for applets, Life cycle of applet, HTML Tags for applet.

--Suggested readings

- Programming with JAVA by E Balaguruswamy (Tata McGraw-Hill Publication)
- Herbert Schildt: JAVA 2 - The Complete Reference, TMH, Delhi
- Herbert Schildt: JAVA 2 - The Complete Reference, TMH, Delhi

ENTERPRISE RESOURCE PLANNING	
UNIT I	Introduction of ERP - Origin of ERP, Expansion, Characteristics, Functional Area of ERP, Components of ERP
UNIT II	Features of ERP5 – Accounting & Finance, CRM, Production Management, Knowledge Management, ecommerce, Banking etc
UNIT III	Connectivity to plant floor information -Direct Integration, Database Integration, EATM, Custom Integration solutions
UNIT IV	Implementation – Process Preparation, Configuration, Two Tier ERP, Customization, Extension, Data Migration
UNIT V	Comparison to special – purpose applications – Advantages, Benefits, Disadvantages

--Suggested readings

- Rouse, Margaret. "ERP (enterprise resource planning)"
- Montgomery, Nigel (2010). "[Two-Tier ERP Suite Strategy: Considering Your Options.](#)" Gartner Group. July 28, 2010. Retrieved September 20, 2012.
- Ramaswamy Nilesh V K (September 27, 2007). "[Data Migration Strategy in ERP](#)".

	LAB - MYSQL
	<p>Introduction to database concepts: Advantages of DBMS; Data Model; Relation/Table, attribute/fields, Tuple / Rows; Concept of Keys- Primary Key, Candidate key, Alternate key;</p> <p>Introduction to MySQL: Features, data types (ANSI SQL 99 standard commands)</p>
	<p>SQL commands: DML (SELECT, INSERT, UPDATE, DELETE); DDL(CREATE, DROP, ALTER); Working with SQL SELECT Statement: Selecting All or Specific Column, Using Arithmetic Operators, Defining and using Column Alias, Using Comparison operators - =, , <=, >=, < >, BETWEEN, IN, LIKE(%), Logical Operators -AND, OR, NOT; Displaying Table Structure; using WHERE clause, Working with Character Strings and Dates, Working with NULL values; ORDER BY Clause, Sorting in Ascending/Descending Order, Sorting By Column Alias Name, Sorting On Multiple Columns;</p>
	<p>MySQL functions: String Function - CHAR(), CONCAT(),INSTR(), LCASE(), LEFT(), LOWER(), LENGTH(), LTRIM(), MID(), RIGHT(), RTRIM(), SUBSTR(), TRIM(), UCASE(), UPPER().</p> <p>Mathematical Functions - POWER(), ROUND(), TRUNCATE(). Date and Time Functions - CURDATE() , DATE(), MONTH(), YEAR(), DAYNAME(), DAYOFMONTH(), DAYOFWEEK(), DAYOFYEAR(), NOW(), SYSDATE().</p>
	<p>Manipulation data: Inserting New Records, Inserting New Rows with Null Values, Inserting NUMBER, CHAR and DATE Values, Update Statement to Change Existing Data of a Table, Updating Rows in A Table, Delete statement - removing row/rows from a Table; Creating Table using CREATE TABLE, ALTER TABLE for adding a new column, using naming conventions for column names;</p>
	<p>Database Transactions -Concept of Database Transaction, Committing and revoking a Transaction using COMMIT and ROLLBACK, working with SAVEPOINTS.</p> <p>Advanced SQL- Grouping & Table Joins, Grouping Records: GROUP BY, Group functions - MAX(), MIN(), AVG(), SUM(), COUNT(); using COUNT(*), DISTINCT clause with COUNT, Group Functions and Null Values, Displaying Data From Multiple Tables: Cartesian product, Union, concept of Foreign Key, EquiJoin</p> <p>Table and Integrity Constraints -Creating a Table with PRIMARY KEY and NOT NULL constraints, adding a Constraint, enabling Constraints, Viewing Constraints, Viewing the Columns Associated with Constraints; ALTER TABLE for deleting a column, ALTER TABLE for modifying data types of a column DROP Table for deleting a table;</p>

INTRODUCTION TO WEB DESIGNING	
UNIT I	Web Design Principles - Basic principles involved in developing a web site, Planning process, Five Golden rules of web designing, Designing navigation bar, Page design, Home Page Layout, Design Concept.
UNIT II	Introduction to HTML - What is HTML, HTML Documents, Basic structure of an HTML document, Creating an HTML document, Mark up Tags, Heading-Paragraphs, Line Breaks, HTML Tags.
UNIT III	Elements of HTML -Introduction to elements of HTML, Working with Text, Working with Lists, Tables and Frames, Working with Hyperlinks, Images and Multimedia, Working with Forms and controls.
UNIT IV	Introduction to Cascading Style Sheets - Concept of CSS, Creating Style Sheet, CSS Properties, CSS Styling(Background, Text Format, Controlling Fonts), Working with block elements and objects, Working with Lists and Tables, CSS Id and Class, Box Model(Introduction, Border properties, Padding Properties, Margin properties), CSS Advanced(Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute sector), CSS Color, Creating page Layout and Site Designs.
UNIT V	Introduction to Web Publishing or Hosting -Creating the Web Site, Saving the site, Working on the web site, Creating web site structure, Creating Titles for web pages, Themes-Publishing web sites

--Suggested readings

- HTML 5 in simple steps , Kogent Learning Solutions Inc. Dreamtech Press
- HTML, XHTML, and CSS Bible, 5ed , Steven M. Schafer Wiley India
- Beginning HTML, XHTML, CSS, and JavaScript John Duckett Wiley India
- Beginning CSS: Cascading Style Sheets for Web Design Ian Pouncey, Richard York Wiley India
- Web Technologies: HTML, Javascript Kogent Learning Wiley India
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COMPUTER GRAPHICS & MULTIMEDIA	
UNIT I	BASIC CONCEPTS- 2D Transformations – Clipping – Window – View Prot Mapping – Graphical User Interfaces and Interactive Input Methods – Picture Construction Techniques – Virtual Reality Environment.
UNIT II	3D GRAPHICS - 3D Transformation – 3D Viewing – Visible Surface Detection – Back Face Detection – Depth Buffer Method – Scan Line Method.
UNIT III	MULTIMEDIA BASICS - Introduction to Multimedia – Components – Hypermedia – Authoring – Authoring tools – File formats – Color models – Digital Audio representation – Transmission – Audio signal processing – Digital music making – MIDI – Digital video – Video compression techniques – Video performance measurements – Multimedia Databases – Animation – Key frames and tweening techniques – Principles of animation – Virtual reality – Multimedia for portable devices
UNIT IV	MULTIMEDIA COMMUNICATION - Stream characteristics for Continuous media – Temporal Relationship – Object Stream Interactions - Media Synchronization – Models for Temporal Specifications – Streaming of Audio and Video – Recovering from packet loss – RTSP — Multimedia Communication Standards –RTP/RTCP – SIP and H.263- Real time streaming and On-demand streaming
UNIT V	MULTIMEDIA APPLICATION DEVELOPMENT - Design, Development and evaluation of multimedia a system - The development of user interface design - Design Process - MultiMedia & the Internet - Multimedia conferencing - Multimedia file sharing – Multimedia broadcasting - Multimedia Development Issues - Multimedia project - Structured Multimedia development - Multimedia project timing - Sample project

REFERENCES:

1. Donald Hearn and M. Pauline Baker, “Computer Graphics in C Version”, Second Edition, Pearson Education
2. Tom McReynolds – David Blythe “ Advanced Graphics Programming Using OpenGL” , Elsevier, 2010
3. Parag Havaldar and Gerard Medioni, “Multimedia Systems-Algorithms, Standards and Industry Practices”, Course Technology, Cengage Learning, 2010.
4. John F. Koegel Bufend , “Multimedia systems”, Pearson Education, Delhi, 2002
5. Ralf Steinmetz and Klara “Multimedia Computing, Communications and Applications”, Pearson Education,2004.
6. Kurose and Ross, ‘Computer Networks : A top down Approach’, Pearson Education, 2002
7. Mohammad Dastbaz, Desgning Interactive Multimedia Systems
8. Multimedia – Technology and applications David Hillman Galgotia Publications, Delhi
9. Ralf Steinmetz and Klara Nahrstedt “Multimedia Applications”, Springer, 2007.

CLIENT SERVER TECHNOLOGY	
UNIT I	Introduction- Introduction to client/server computing - Main frame -centric client/server computing – Downsizing and client/server computing - Preserving mainframe applications-Investment through porting - Client/server development tools - Advantages of Client/Server computing.
UNIT II	CLIENT COMPONENT Components of client/server applications - The client - Client service, request for services, RPC, windows services, Fax/print services, Remote boot services, other remote services-Utility services and other services, Dynamic data exchange, Object linking and embedding. Common request broker architecture-The server - detailed server functionality - The networking operating system - novell network - LAN manager - IBM LAN server-Banyan VINES-PC network file services - Server operating systems: Netware,OS/2,Windows NT unix-system application architecture (SAA)
UNIT III	SERVER COMPONENT Components of client/server architecture-Connectivity - Open Systems Interconnect (OSI) - Inter Process Communication (IPC) - Communication interface technology - Wide area network technology - Client/server development software - Platform migration and reengineering of existing systems - Hardware components.
UNIT IV	DISTRIBUTED OBJECTS AND INTERNET Client/server with distributed objects - Distributed objects and components-From orb to business objects - Compound Documents : The client framework - OLE/DCOM-Client/server and the Internet-Web client/server - The hyper text era - The interactive era - The Java object era - The distributed object era.
UNIT V	APPLICATION DEVELOPMENT TOOLS GUI front end to 3270/5250 screens - The prototype process - Application development - Workbench architecture - Information Engineering facility Architecture - EASEL Workbench - Ellipse - SQL Windows - Power builder - SQL Tool set. APT workbench component.

--Suggested readings:

- Dewire and dawna travis,'client/server computing'-mcgraw hill-1993.
- Beth gold-Bernstein, David Marca, 'Designing enterprise client/server systems', phi-1998.
- Thomas S Ligon, 'Client/Server communications', Mcgraw Hill series on client/server computing-1997.
- Robert Orfali, Dan Harley, Jeri Edward, 'The essential client/server survival guide', second edition, Galgotia 1997.

LAB – COMPUTER GRAPHICS	
	TWO DIMENSIONAL TRANSFORMATIONS - Creation of two dimensional objects and applying simple transformations like Translation, Scaling, Rotation and applying Composite transformations.
	CLIPPING AND WINDOWING - Clipping and windowing of a part of the created two dimensional object using any one of the clipping algorithm
	THREE DIMENSIONAL TRANSFORMATIONS - Creation of simple three dimensional objects like cube, cone and cylinder and applying simple transformations like Translation, Scaling, Rotation, Composite transformations, projections –Parallel, Perspective.
	VISIBLE SURFACE DETECTION - Finding out visible surfaces and removal of hidden surfaces in simple objects using object space and image space algorithms.
	IMAGE EDITING - Image enhancement, Image transformation from color to gray scale and vice versa, Image manipulation and Image optimization for web - Usage of editing tools, layers, filters, special effects and color modes. Creation of simple Gif animated images with textual illustrations, Image Compression.

Software:

1. C/C++/Java
2. OpenGL 3.7 (precompiled GLUT libraries 3.7 – Open source)
3. Any open source software like 'GIMP 2.6'/ Flash 8.0 /Photoshop

VB.NET	
UNIT I	DOT NET Framework, Overview and Base Class Library, MSIL, Common Language Run Time (CLR), Events, .NET Assemblies, Shared Assemblies, Advantages of Assemblies over Predecessors, Dynamic Link Library (DLL), Namespaces, Visual Studio IDE.
UNIT II	Variables, Data types, Operators, Control Structures: if-then-else, Select Case, for-next, for Each....Next, Do loop, While...End While, Type Conversions, Functions, Subroutines, Classes and Objects, Access modifiers, Error Handling and Debugging
UNIT III	Array: One dimensional, two dimensional, variable size arrays, System. Array class, Array list class, Building Windows Application: button, checkbox, checkedlistbox, colordialog, combobox, datetimetypepicker, label, listbox, listview, picturebox, progressbar.
UNIT IV	Controls: Radiobutton, textbox, masked text box, rich text box, numeric up-down, treeview, tooltip, timer, Tab control, panel, group box, menu strip, status strip, tool strip, openfiledialog, savefiledialog, folderbrowserdialog.
UNIT V	Basic Idea of ADO.NET, OleDbConnection, OleDbCommand, OleDbDataReader, OleDbDataAdapter, Dataset, Datatable, Datarow, Datacolumn. Using Data controls: Datagridview, binding source, binding navigator.

Suggested readings

- VB.NET Programming (Black Book) , Steven Holzne
- VB.NET Programming Bible, Bill Evjen, Jason Beras

	PHP PROGRAMMING
UNIT I	<p>Introduction to PHP – Evaluation of Php, Basic Syntax, Defining Variable and Constant, Php Data Types, Operators & Expression</p> <p>Handling HTML form with Php –Capturing form data, Dealing with Multiple Value field, Generating File uploaded form , Redirecting a form after submission</p>
UNIT II	<p>Decisions and loop - Making Decisions, Doing Repetitive task with looping , Mixing Decisions and looping with Html</p> <p>Functions-What is a function, Define a function, Call by value and Call by reference, Recursive function</p> <p>String - Creating and accessing String ,Searching & Replacing String, Formatting String, String Related Library function</p> <p>Array - Anatomy of an Array, Creating index based and Associative array, Accessing array Element, Looping with Index based array, Looping with associative array using each() and foreach(), Some useful Library function</p>
UNIT III	<p>Working with file and Directories -Understanding file& directory, Opening and closing a file, Coping ,renaming and deleting a file, Working with directories, Building a text editor, File Uploading & Downloading</p> <p>State Management - Using query string(URL rewriting), Using Hidden field, Using cookies, Using session</p> <p>String Matching with Regular Expression- What is regular expression, Pattern matching in Php, Replacing text, Splitting a string with a Regular Expression</p>
UNIT IV	<p>Generating Image with Php - Basics of computer Graphics, Creating Image, Manipulating Image, Using text in Image</p> <p>Data Base Connectivity with MySQL - Introduction to RDBMS, Connection with MySql Database, Performing basic database operation(DML) (Insert, Delete, Update, Select), Setting query parameter, Executing query, Join (Cross joins, Inner joins, Outer Joins, Self joins.)</p>
UNIT V	<p>Introduction to OOPS -Introduction –Objects, Declaring a class, The new keyword and constructor, Destructor, Access method and properties using \$this variable, Public ,private, protected properties and methods, Static properties and method, Class constant, Inheritance & code reusability, Polymorphism, Parent:: & self:: keyword, Instanceof operator, Abstract method and class, Interface, Final</p> <p>Exception Handling-Understanding Exception and error, Try, catch, throw</p>

E Commerce	
UNIT I	Electronic Commerce Framework, Traditional vs. Electronic business applications, the anatomy of E-commerce applications.
UNIT II	Network infrastructure for E-Commerce - components of the I-way - Global information distribution networks - public policy issues shaping the I-way. The internet as a network infrastructure. The Business of the internet commercialization.
UNIT III	Network security and firewalls - client server network security - firewalls and network security - data and message security - encrypted documents and electronic mail.
UNIT IV	Electronic Commerce and world wide web, consumer oriented E-commerce, Electronic payment systems, Electronic data interchange (EDI),EDI applications in business ,EDI and E-commerce EDI implementation.
UNIT V	Intra organizational Electronic Commerce supply chain management. Electronic Commerce catalogs, Document Management and digital libraries.

--Suggested readings:

- R. Kalakota and A. B. Whinston, Frontiers of Electronic Commerce, Addison Wesley, 1996.
- R.Kalakota and A.B.Whinston,Readings in Electronic Commerce, Addison Wesley, 1997.
- David Kosiur, Understanding Electronic Commerce, Microsoft Press, 1997.
- Soka, From EDI to Electronic Commerce , McGraw Hill, 1995.
- SAILY CHAN, ELECTRONIC COMMERCE MANAGEMENT, JOHN WILEY, 1998.

- Lab VB.Net --- Practical of VB.Net As per Theory Paper
- Lab Php --- Practical of Php As per Theory Paper

ANDROID PROGRAMMING	
UNIT I	Introduction - Introduction to mobile application development-trends-introduction to various platforms-introductions to smart phones-introduction to development 19 IT2013 SRM(E&T) environment/IDE. Android platform features and architecture-versions-Android market ANDROID DEVELOPMENT SETUP – Eclipse, ADT, Android SDK, tools. Android application anatomy, emulator setup. Application framework basics: resources, layout, values, asset XML representation, generated R.Java file, Android manifest file. Creating a simple application.
UNIT II	ACTIVITIES, INTENT AND UI DESIGN -Introduction to activities-activities life-cycle-User Interface INTENT – intent object, intent filters – adding categories, linking activities, user interface design. Components: Fragments, basic views, list views, picker views ,adapter views, Menu ,Action Bar etc, layouts, basics of screen design, registering listeners and different event Listeners. Creating application using multiple activities- views with different layouts
UNIT III	DATA PERSISTENCE -Shared preferences-File Handling-Managing data using SQLite database CONTENT PROVIDERS – user content provider, android provided content providers. Creating a simple applications using content provider and persisting data into database
UNIT IV	BACK GROUND RUNNING PROCESS, NETWORKING AND TELEPHONY SERVICES - Services-Introduction to services–local service-remote service and binding the service-communication between service and activity-Multi-Threading-Handlers and AsyncTask-Android network programming- Telephony services- SMS and telephony applications BROADCAST RECEIVERS–Introduction to receivers, pending intent, Notification.
UNIT V	ADVANCED APPLICATIONS -Location based services-Google maps services using Google API-Overview on Tweened animations, Property animations- android media-Google App engine - connecting Android apps-Cloud Storage-Android application development guidelines-publishing android applications

--Suggested readings:

- Wei-Meng Lee, "Beginning Android 4 Application Development" Wrox Publications, ISBN: 978-1-118-19954-1, 2012. 20 IT2013 SRM(E&T)
- Paul Deital and Harvey Deital, "Android How to Program" ,Detial associates publishers, ISBN-10: 0132990547 ISBN-13: 978-0132990547, 2013.
- Zigurd Mednieks, Laird Dornin, G. Blake Meike, Masumi Nakamura, "Programming Android Java Programming for the New Generation of Mobile Devices", O'Reilly Media, ISBN-10: 1449316646 | ISBN-13: 978- 1449316648. July 2011.
- <http://developer.android.com>

SOFTWARE ENGINEERING	
UNIT I	Introduction to Software Engineering, Software Components, Software Characteristics, Software Crisis, Software Engineering Processes, Similarity and Differences from Conventional Engineering Processes, Software Quality Attributes. Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models.
UNIT II	Requirement Engineering Process: Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modeling, Data Flow Diagrams, Entity Relationship Diagrams, Decision Tables, SRS Document, IEEE Standards for SRS.
UNIT III	Basic Concept of Software Design, Architectural Design, Low Level Design: Modularization, Design Structure Charts, Pseudo Codes, Flow Charts, Coupling and Cohesion Measures, Design Strategies: Function Oriented Design, Object Oriented Design, Top-Down and Bottom-Up Design. Software Measurement and Metrics: Various Size Oriented Measures: Halstead's Software Science, Function Point (FP) Based Measures, Cyclomatic Complexity Measures: Control Flow Graphs.
UNIT IV	Testing Objectives, Unit Testing, Integration Testing, Acceptance Testing, Regression Testing, Testing for Functionality and Testing for Performance, Top-Down and Bottom-Up Testing Strategies: Test Drivers and Test Stubs, Structural Testing (White Box Testing), Functional Testing (Black Box Testing), Test Data Suit Preparation, Alpha and Beta Testing of Products. Static Testing Strategies: Formal Technical Reviews (Peer Reviews), Walk Through, Code Inspection, Compliance with Design and Coding Standards.
UNIT V	Software as an Evolutionary Entity, Need for Maintenance, Categories of Maintenance: Preventive, Corrective and Perfective Maintenance, Cost of Maintenance, Software Re-Engineering, Reverse Engineering. Software Configuration Management Activities, Change Control Process, Software Version Control, An Overview of CASE Tools. Estimation of Various Parameters such as Cost, Efforts, Schedule/Duration, Constructive Cost Models (COCOMO), Resource Allocation Models, Software Risk Analysis and Management.

Suggested readings

- Software Engineering, Pressman, TMH
- Software engineering, Ian Sommerville, 8th
- Software Engineering Fundamentals, Ali Behforouz, Hudson, Oxford Ed., Addison Wesley Longman.

INFORMATION SECURITY & CYBER LAW	
UNIT I	History of Information Systems and its Importance, basics, Changing Nature of Information Systems, Need of Distributed Information Systems, Role of Internet and Web Services, Information System Threats and attacks, Classification of Threats and Assessing Damages Security in Mobile and Wireless Computing- Security Challenges in Mobile Devices, authentication Service Security, Security Implication for organizations, Laptops Security Concepts in Internet and World Wide Web: Brief review of Internet Protocols- TCP/IP, IPV4, IPV6. Functions of various networking components-routers, bridges, switches, hub, gateway and Modulation Techniques
UNIT II	Basic Principles of Information Security, Confidentiality, Integrity Availability and other terms in Information Security, Information Classification and their Roles. 11 Security Threats to E Commerce, Virtual Organization, Business Transactions on Web, E Governance and EDI, Concepts in Electronics payment systems, E Cash, Credit/Debit Cards.
UNIT III	Physical Security- Needs, Disaster and Controls, Basic Tenets of Physical Security and Physical Entry Controls, Access Control- Biometrics, Factors in Biometrics Systems, Benefits, Criteria for selection of biometrics, Design Issues in Biometric Systems, Interoperability Issues, Economic and Social Aspects, Legal Challenges Framework for Information Security, ISO 27001, SEE-CMM, Security Metrics, Information Security Vs Privacy
UNIT IV	Model of Cryptographic Systems, Issues in Documents Security, System of Keys, Public Key Cryptography, Digital Signature, Requirement of Digital Signature System, Finger Prints, Firewalls, Design and Implementation Issues, Policies Network Security- Basic Concepts, Dimensions, Perimeter for Network Protection, Network Attacks, Need of Intrusion Monitoring and Detection, Intrusion Detection Virtual Private Networks- Need, Use of Tunneling with VPN, Authentication Mechanisms, Types of VPNs and their Usage, Security Concerns in VPN
UNIT V	Laws, Investigation and Ethics: Cyber Crime, Information Security and Law, Types & overview of Cyber Crimes, Cyber Law Issues in E-Business Management Overview of Indian IT Act, Ethical Issues in Intellectual property rights, Copy Right, Patents, Data privacy and protection, Domain Name, Software piracy, Plagiarism, Issues in ethical hacking.

--Suggested reading:

- Godbole, "Information Systems Security", Willey
- Merkov, Breithaupt, "Information Security", Pearson Education
- Yadav, "Foundations of Information Technology", New Age, Delhi
- Schou, Shoemaker, "Information Assurance for the Enterprise", Tata McGraw Hill
- Sood, "Cyber Laws Simplified", Mc Graw Hill
- Furnell, "Computer Insecurity", Springer
- IT Act 2000

Lab Android Programming --- Practical of Android Programming as per Theory Paper