DEPARTMENT OF HIGHER EDUCATION

RAJA MAHENDRA PRATAP SINGH UNIVERSITY, ALIGARH

According to

National Education Policy-2020

Common Minimum Syllabus in

BACHELOR IN COMPUTER APPLICATION (B.C.A.)

SYLLABUS DEVELOPED BY				
S.N.	**NAME**	**DESIGNATION**	**DEPARTMENT**	**COLLEGE**
1	**PROF. SHUBHNESH KUMAR GOYAL**	Professor	Mathematics	**D.S.(P.G.) COLLEGE, ALIGARH**
2	**DR. MONIKA VARSHNEY**	Assistant Professor	Computer Science	**D.S.(P.G.) COLLEGE, ALIGARH**
3	**ASHIESH PRAKASH**	Assistant Professor	Computer Science	**D.S.(P.G.) COLLEGE, ALIGARH**

BACHELOR OF COMPUTER

APPLICATION YEAR: FIRST, SEMESTER –I

S.No.	Paper Code	Subject	Nature	Periods			Evaluation Scheme				Sub Total	Credit
							Sessional Exam			Exam		
				L	T	P	CT	TA	Total	ESE		
1	RB120101T	Computer Fundamentals And MS-Office	Core	4	0	0	15	10	25	75	100	4
2	RB120102T	Introduction to Programming using C	Core	4	0	0	15	10	25	75	100	4
3	RB120103T	Introduction to HTML CSS-XML	Core	2	0	0	15	10	25	75	100	2
4	RB120104T	Mathematics-I	Minor	3	0	0	15	10	25	75	100	3
5		Business Communication And Soft Skill	SEC	3	0	0					100	3
PRACTICALS												
6	RB120106P	MS-Office and C Programming, HTML CSS-XML Lab	Practical	0	0	4				100	100	2
Co-curricular (Qualifying)												
7	RJ000101	First Aid & Health		0	2	0				100	100	2
		Total		**16**	**2**	**4**					**600**	20

1. Abbreviations: L:Lecture, T:Tutorial, P:Practical, CT:ClassTest, TA:Teacher's Assessment, ESE: End Semester Examination SEC: Skill Enhancement Courses, VAC: Value Added Courses

YEAR: FIRST, SEMESTER –II

S.No.	Paper Code	Subject	Nature	Periods			Evaluation Scheme				Sub Total	Credit
							Sessional Exam			Exam		
				L	T	P	CT	TA	Total	ESE		
1	RB120201T	Object Oriented Programming using C++	Core	4	0	0	15	10	25	75	100	4
2	RB120202T	Data Structure using 'C'/'C++'	Core	4	0	0	15	10	25	75	100	4
3	RB120203T	Digital Electronics	Core	2	0	0	15	10	25	75	100	2
4	RB120204T	Numerical Methods	Minor	3	0	0	15	10	25	75	100	3
5		Principles of Management	SEC	3	0	0					100	3
PRACTICALS												
6	RB120206P	Data Structure, C++ Programming Lab	Practical	0	0	4				100	100	2
Co-curricular (Qualifying)												
7	RJ000201	Human Values and Environmental Studies		0	2	0				100	100	2
		Total		**16**	**2**	**4**					**600**	20

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YEAR: Second, SEMESTER –III

S.No.	Paper Code	Subject	Nature	Periods			Evaluation Scheme				Sub Total	Credit
							Sessional Exam			Exam ESE		
				L	T	P	CT	TA	Total			
1	RB120301T	Computer Organization And Architecture	Core	4	0	0	15	10	25	75	100	4
2	RB120302T	Operating System with the case study of UNIX & Windows	Core	4	0	0	15	10	25	75	100	4
3	RB120303T	Data Base Management System	Core	2	0	0	15	10	25	75	100	2
4	RB120304T	Statistical Method and Application	Minor	3	0	0	15	10	25	75	100	3
5		E-Commerce and ERP	SEC	3	0	0					100	3
PRACTICALS												
6	RB120306P	DBMS ,Operating System Lab	Practical	0	0	4				100	100	2
Co-curricular (Qualifying)												
7	RJ000301	Physical Education and Yoga		0	2	0				100	100	2
		Total		**16**	**2**	**4**					**600**	20

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YEAR: Second, SEMESTER –IV

S.No.	Paper Code	Subject	Nature	Periods			Evaluation Scheme				Sub Total	Credit
							Sessional Exam			Exam ESE		
				L	T	P	CT	TA	Total			
1	RB120401T	JAVA Programming	Core	4	0	0	15	10	25	75	100	4
2	RB120402T	Web Technology with PHP & MySQL	Core	4	0	0	15	10	25	75	100	4
3	RB120403T	Computer Network	Core	2	0	0	15	10	25	75	100	2
4	RB120404T	Optimization Techniques	Minor	3	0	0	15	10	25	75	100	3
PRACTICALS												
5	RB120405T	JAVA Programming, PHP & MySQL Lab	Practical	0	0	4				100	100	2
Research Project												
6	RB120406R	Project Dissertation	Research	0	0	6					100	3
Co-curricular (Qualifying)												
7	RJ000401	Hind Language		0	2	0				100	100	2
		Total		**16**	**2**	**10**					**600**	20

1. Abbreviations: L:Lecture, T:Tutorial, P:Practical, CT:ClassTest, TA:Teacher's Assessment, ESE: End Semester Examination SEC: Skill Enhancement Courses, VAC: Value Added Courses

YEAR: Third, SEMESTER – V

S.No.	Paper Code	Subject	Nature	Periods			Evaluation Scheme				Sub Total	Credit
							Sessional Exam			Exam		
				L	T	P	CT	TA	Total	ESE		
1	RB120501T	Network Security	Core	4	0	0	15	10	25	75	100	4
2	RB120502T	Elective-I: RB120502AT: Design & Analysis of Algorithm RB120502BT: Mobile Application Development using Android	Core	4	0	0	15	10	25	75	100	4
3	RB120503T	System Analysis & Design	Core	2	0	0	15	10	25	75	100	2
4	RB120504T	Computer Graphics	Core	2	0	0	15	10	25	75	100	2
PRACTICALS												
6	RB120505P	Computer Graphics Lab	Practical	0	0	4				100	100	4
Research Project												
7	RB120506R	Summer Training	Research	0	0	8				100	100	4
		Total		**12**	**0**	**12**					**600**	20

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YEAR: Third, SEMESTER – VI

S.No.	Paper Code	Subject	Nature	Periods			Evaluation Scheme				Sub Total	Credit
							Sessional Exam			Exam		
				L	T	P	CT	TA	Total	ESE		
1	RB120601T	Cyber Law and Internet Security	Core	4	0	0	15	10	25	75	100	4
2	RB120602T	Artificial Intelligence	Core	4	0	0	15	10	25	75	100	4
3	RB120603T	Visual Basic.NET	Core	2	0	0	15	10	25	75	100	2
4	RB120604T	Elective-II RB120604AT: Data Mining and Ware Housing RB120604BT: Python Programming	Core	2	0	0	15	10	25	75	100	2
PRACTICALS												
6	RB120605P	Visual Basic.NET Lab	Practical	0	0	4				100	100	4
Research Project												
7	RB120605R	Major Project	Research	0	0	8				100	100	4
		Total		**12**	**0**	**8**					**600**	20

Abbreviations: L:Lecture, T:Tutorial, P:Practical, CT:ClassTest, TA:Teacher's Assessment, ESE: End Semester Examination SEC: Skill Enhancement Courses, VAC: Value Added Courses

DETAILED SYLLABUS FIRST SEMESTER PAPER CODE:

PAPER CODE: RB120101T

Computer Fundamentals and MS-Office

UNIT-I

Introduction to Computers: Introduction, Characteristics of Computers, Block diagram of computer. Types of computers and features, Mini Computers, Micro Computers, Mainframe Computers, Super Computers. Types of Programming Languages (Machine Languages, Assembly Languages, High Level Languages). Data Organization, Drives, Files, Directories. Types of Memory (Primary And Secondary) RAM ROM, PROM, and EPROM. Secondary Storage Devices (FD, CD, HD, Pen drive) I/O Devices (Scanners, Plotters, LCD, Plasma Display) Number Systems Introduction to Binary, Octal, Hexadecimal system Conversion, Simple Addition, Subtraction, Multiplication.

UNIT-II

Algorithm and Flowcharts Algorithm: Definition, Characteristics, Advantages and disadvantages, Examples Flowchart: Definition, Define symbols of flowchart, Advantages and disadvantages, Examples

UNIT-III

Operating System and Services in O.S., DOS, History, Files and Directories, Internal and External Commands, Batch Files, Types of O.S.

UNIT-IV

Windows Operating Environment Features of MS-Windows, Control Panel, Taskbar, Desktop, Windows Application, Icons, Windows Accessories, Notepad, Paintbrush. Editors and Word Processors Basic Concepts, Examples: MS-Word, Introduction to desktop publishing. Spreadsheets and Database packages Purpose, usage, command, MS-Excel, Creation of files in MS-Access, Switching between application, MS-PowerPoint.

Suggested Books:

1. Fundamental of Computers, By V.Rajaraman B.P.B. Publications
2. Fundamental of Computers, By P.K. Sinha
3. MS-Office 2000(For Windows), By Steve Sagman
4. Computer Networks, By Tennenbum Tata MacGraw Hill Publication

DETAILED SYLLABUS
FIRST SEMESTER
PAPER CODE: RB120102T
Introduction to Programming using C

UNIT-I

C basics: C character set, Identifiers and keywords, Data types, constants, variables and arrays, declarations, expressions statements, symbolic constants, compound statements, arithmetic operators, unary operators, relational and logical operators, assignment operators, conditional operators, bit operators.

UNIT-II

Decision Control Structures: If Statement, If-else statement, Nested if (), If () ladder, Switch, case statement, Iterative statements: For loop, While loop, Do-while () loop, Conditional statements: Break, Continue, Storage Classes, Array: Declaration of an Array, Initialization of Array, Types of Array: Single Dimension Array, Two, Dimensional Array, Address Calculation of an Element of a 2-D Array

UNIT-III

Functions: Library Functions, User Defined Functions, Function Declaration, Prototype Declaration, Types of Arguments: Actual Arguments, Formal Arguments, Function Definition, Passing Arrays as Parameters, Methods to Call a Function: Call by Value, Call by Reference.

UNIT-IV

Pointers: Declaration of Pointer Variables, Pointer Arithmetic, Returning Multiple Output Values through a Function Strings. Structures, Unions, Array of Structures, Enumerations, File Handling: Opening a File, Closing a File, File, Opening Modes, Reading from and Writing to a File, Copying Content of an ExistingFile to another, Command Line Arguments, argc and argv Parameters, Pre-processor Directives.

Suggested Books:

1. E.Balagurusamy, “Programming in ANSI C”, TMH
2. Peter Norton’s, “Introduction to Computers”, TMH
3. Yashwant Kanetkar, “Let us C”, BPB

DETAILED SYLLABUS
FIRST SEMESTER
PAPER CODE: RB120103T

Introduction to HTML, CSS- XML

UNIT-I

Basics of Internet and Web The basics of Internet, World Wide Web, Web page, Home page, Web site, Static, Dynamic and Active web page, Overview of Protocols, Simple Mail Transfer Protocol, Gopher, Telnet, Emails, TFTP, Simple Network Management Protocol, Hyper Text Transfer Protocol, Client server computing concepts. Web Client and Web Server Architecture, Web Browsers Client Side Scripting Languages, VB Script and Java Script, Active X control and Plug-ins, , Image maps, CGI, API web database connectivity, DBC, ODBC, Dynamic HTML, CSSP (Cascading Style Sheet Positioning) and JSSS (JavaScript assisted Style Sheet), The ID Attribute, DHTML Events

Introduction to HTML: Editors, Basics, Element, Attribute, Headings, Paragraphs, Styles, Formatting, Quotations, Comments, CSS, Links, Images, Tables, Lists, Blocks, Classes, ID, frames,File Paths, Head, Layout, Computer Code, Entities, Symbols, Char set, Color and Background of Web Pages, Hypertext, Hyperlink and Hypermedia, Links, Anchors and URLs, Links to External Documents, Different Section of a Page and Graphics, Footnote and E-Mailing, Creating Table, Frame, Form and Style Sheet.

UNIT-II

CSS: Introduction, Syntax, Colors, Backgrounds, Borders, Margins, Padding, Height/ Width, Box Model, Outline, Text, Fonts, Icons, Links, Lists, Tables, Display, Max, Width, Position, Overflow, Float, Inline, Block, Align, Combinators, Pseudo, Class, Pseudo Elements, Opacity, Navigation Bar, Dropdowns, Image Gallery, Image Sprites, Attr Selectors, Forms, Counters, Website Layout, Units, Specificity.

XML: Introduction, Tree, Syntax, Elements, Attributes, Namespaces, Display, HTTP request, Parser, DOM, XPath, XSLT, XQuerry, XLink, Validator, DTD, Schema, Server

Suggested Books:

1. Shelley Powers, “Dynamic Web Publishing” 2
2. Html & CSS: The Complete Reference 5th Edition (English, Paperback, Thomas A. Powell)
3. XML: The Complete Reference Book by Heather Williamson

DETAILED SYLLABUS
FIRST SEMESTER
PAPER CODE: RB120104T
Mathematics -I

UNIT-I

Determinants: Definition, Minors, Cofactors, Properties of Determinants MATRICES: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Adjoint, Inverse, Cramers Rule, Rank of Matrix Dependence of Vectors, Eigen Vectors of a Matrix, Caley, Hamilton Theorem (without proof).
Limits & Continuity: Limit at a Point, Properties of Limit, Computation of Limits of VariousTypes of Functions, Continuity at a Point, Continuity Over an Interval, Intermediate ValueTheorem, Type of Discontinuities

UNIT-II

Differentiation: Derivative, Derivatives of Sum, Differences, Product & Quotients, Chain Rule, Derivatives of Composite Functions, Logarithmic Differentiation, Rolle's Theorem, Mean Value Theorem, Expansion of Functions (Maclaurin's & Taylor's),Indeterminate Forms, L-Hospitals Rule, Maxima & Minima, Curve Tracing, Successive Differentiation & Liebnitz Theorem.
Integration: Integral as Limit of Sum, Fundamental Theorem of Calculus(without proof.), Indefinite Integrals, Methods of Integration Substitution, By Parts, Partial Fractions, Reduction Formulae for Trigonometric Functions, Gamma and Beta Functions(definition).

UNIT-III

Vector Algebra: Definition of a vector in 2 and 3 Dimensions, Double and Triple Scalar and Vector Product and physical interpretation of area and volume.

Suggested Books:

1. B.S. Grewal, "Elementary Engineering Mathematics", 34th Ed., 1998.
2. Shanti Narayan, "Integral Calculus", S. Chand & Company, 1999
3. H.K. Dass, "Advanced Engineering Mathematics", S. Chand & Company, 9th Revised Edition, 2001.

DETAILED SYLLABUS
FIRST SEMESTER
Business Communication and Soft Skills

UNIT-I

Means of Communication: Meaning and Definition, Process, Functions, Objectives, Importance, Essentials of good communication, Communication barriers, 7C's of Communication, Types of Communication: Meaning, nature and scope.

Oral communication: Principle of effective oral communication Techniques of effective speech, Media of oral communication (Face, to, face conversation, Teleconferences, Press Conference, Demonstration, Radio Recording, Dictaphone, Meetings, Rumour, Demonstration and Dramatisation, Public address system, Grapevine, Group Discussion, Oral report, Closed circuit TV). The art of listening, Principles of good listening.

Written Communication Purpose of writing, Clarity in Writing, Principle of Effective writing, Writing Techniques, Electronic Writing Process.

Business Letters & Reports: Need and functions of business letters, Planning & layout of business letter, Kinds of business letters, Essentials of effective correspondence, Purpose, Kind and Objective of Reports, Writing Reports.

UNIT-II

Drafting of business letters: Enquiries and replies, Placing and fulfilling orders, Complaints and follow, up Sales letters, Circular letters Application for employment and resume. **Information Technology for Communication:** Word Processor, Telex, Facsimile(Fax), E-mail, Voice mail, Internet Multimedia, Teleconferencing, Mobile Phone Conversation, Video Conferencing, SMS, Telephone Answering Machine, Advantages and limitations of these types. **Self Analysis:** SWOT Analysis, Who am I, Attributes, Importance of Self Confidence, Self Esteem. Creativity: Out of box thinking, Lateral Thinking**.**

Attitude: Factors influencing Attitude, Challenges and lessons from Attitude, Etiquette. Motivation: Factors of motivation, Self talk, Intrinsic & Extrinsic Motivators. Goal Setting: Wish List, SMART Goals, Blue print for success, Short Term, Long Term, Life Time Goals.

Interpersonal Skills: Gratitude: Understanding the relationship between Leadership Networking & Team work. Assessing Interpersonal Skills Situation description of Interpersonal Skill. Team Work: Necessity of Team Work Personally, Socially and Educationally.

UNIT-III

Leadership: Skills for a good Leader, Assessment of Leadership Skills, Stress Management: Causes of Stress and its impact, how to manage & distress, Circle of control, Stress Busters. Emotional Intelligence: What is Emotional Intelligence, emotional quotient why Emotional Intelligence matters, Emotion Scales, Managing Emotions. **Conflict Resolution:** Conflicts in Human Relations – Reasons Case Studies, Approaches to conflict resolution. Decision Making: Importance and necessity of Decision Making, Process and practical way of Decision Making, Weighing Positives & Negatives.

Suggested Books:

1. Business Communication, "K .K. Sinha, Galgotia Publishing Company, New Delhi".
2. Media and Communication Management, "C.S. Rayudu, Hikalaya Publishing House, Bombay".
3. Essentials of Business Communication, "Rajendra Pal and J.S. Korlhalli, Sultan Chand & Sons, New Delhi

SECOND SEMESTER

PAPER CODE: RB120201T

Object Oriented Programming Using C++

UNIT-I

Introduction: Introducing Object Oriented Approach, Procedural Programming Language Vs Object Oriented Language. Basic concept of OOPs, operators, tokens, variables, Keywords, Data types, identifiers, characters, typedef statement, constants, Enumerated data type.

UNIT-II

Control Flow: If statement, If Else statement, Nested If, Else, Statements, For Loop, While Loop, Do, While Loop, Break, Switch, Continue, goto. Classes and Objects, Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, Constructors and destructors, Default parameter value, object types, C++ garbage collection, dynamic memory allocation, Metaclass / abstract classes.

UNIT-III

Array: Array Illustration, Multi, Dimensional arrays, Strings, Array of Strings, Function prototype, function return data type, parameter passing, Default argument, Inline function, Function Overloading, Array Function, Operator Overloading,

UNIT-IV

Pointers: Pointer to Derived Class, array of Pointers, Inheritance and Polymorphism: Inheritance, Class hierarchy, derivation, public, private & protected, abstract Classes, Single, Multilevel, Multiple, Hierarchical, Hybrid, benefits of Inheritance.

Files and Exception Handling: Streams and files, Namespaces, Exception handling.

Suggested Books:

1. A.R.Venugopal, Rajkumar, T. Ravishanker "Mastering C++", TMH, 1997. 2.S.B.Lippman&J.Lajoie," C++ Primer",3rd Edition, Addison Wesley, 2000.The C programming Lang.,Person Ecl,Dennis Ritchie
3. R.Lafore,"Object Oriented Programming using C++",Galgotia Publications,2004
4. D.Parasons,"Object Oriented Programming using C++",BPB Publication

DETAILED SYLLABUS
SECOND SEMESTER
PAPER CODE: RB120202T
Data Structure Using 'C'/'C++'

UNIT-I

Classification of Data Structure, Operations on Data Structure, Address Calculation, Application of arrays, Limitation of Array, Application of Arrays, Array as Parameters, Sparse Matrices

UNIT-II

Continuous Implementation (Stack): Array Representation, Operations on Stacks: Push & Pop, Applications of stack, Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack Recursion: Recursive Definition and Processes, Principles of Recursion, Tower of Hanoi Problem, Recursion Vs. Iteration Continuous. Implementation (Queue): Array representation and implementation of Queues, Operations on Queue: Create, Add, Delete, Full and Empty Queue, Circular Queue, Dequeue and Priority Queue

UNIT-III

Non Continuous Implementation: Link Lists: Linear List concept, Linked List Terminology, Representation of Linked List in Memory, Types of Linked List, Single Linked List, Doubly Linked List, Single Circular Linked list, Circular Doubly Linked List, Operations on Link List: Create List Insert node (empty list, beginning, middle, end), Delete node (first, general case), Traversing node, Searching node, Print list, Count Nodes, Sort Lists

UNIT-IV:

Trees: Introduction to Tree & its Terminology, Binary trees, Types of Binary trees, Representation of Binary Tree, Traversals (Inorder, Preorder, Postorder),Tree Expression, BinarySearch Tree, Insertion and Deletion in BST.

Sorting & Searching Techniques: Bubble Sort, Selection Sort, Insertion Sort, Quick Sort, Merge Sort, Sequential Search, Binary Search

Suggested Readings:

1. S. Lipschutz,"Data structures",Mc,Graw,Hill International Editions,1986.
2. A. Michael Berman,"Data Structures via C++",Oxford University Press,2002.
3. M. Weiss,"Data Structures and Algorithm Analysis in C++",Pearson Education

DETAILED SYLLABUS
SECOND SEMESTER
PAPER CODE: RB120203T
Digital Electronics

UNIT-I

Number System & Boolean Algebra: Number System: Binary, Octal, Decimal, Hexadecimal, Conversion of Number System, Binary Arithmetic &Complement, Binary Codes: Weighted & Non Weighted, Gray Code, Excess-3 Code. Error Detection Codes, Hamming Code, Boolean Function, Boolean Postulates, De-Morgan's Theorem, Boolean Expressions: Sum of Product, Product of Sum, Minimization of Boolean Expressions using K-Map, Logic Gates: AND, OR, NOT,NAND, NOR, XOR, XNOR, Implementations of Logic Functions using Gates, NAND, NOR Implementations, Multilevel gate Implementations.

Combinational Circuits: Adders & Subtractors: Half Adder, Full Adder, Binary Adder, Half Subtractor, Full Subtractor, Magnitude Comparator: Two Bit Magnitude Comparator, Three Bit Magnitude Comparator, Multiplexer & De-Multiplexer: 4*1 Multiplexer, 8*1Multiplexer, Decoder & Encoder, Parity Checker &Generator, Code Converter.

UNIT-II

Sequential Circuit: Introduction to Flip Flops: SR, JK, T, D, Master Slave Flip Flops, Conversion of Flip Flops, Characteristic Table & Equation, Edge Triggering & Level Triggering, Excitation Table, State Diagram, State Table, State Reduction, Design of Sequential Circuits.

Registers: Introduction of Registers, Classification of Registers, Register with Parallel Load, Shift Registers, Bidirectional Shift Register with Parallel Load.

Counters: Introduction of Counter, Asynchronous/Ripple Counters, Synchronous Counters, BCD Counter, 4-bit Binary Counter with Parallel Load, Design of Synchronous Counters, Ring Counter, Johnson Counter

Suggested Books:

1. Digital Logic and Computer design (PHI) 1998 : M.M. Mano
2. Computer Architecture (PHI) 1998 : M.M. Mano
3. Digital Electronics (TMH) 1998 : Malvino and Lea

SECOND SEMESTER
PAPER CODE: RB120204T

Numerical Methods

UNIT-I

Roots of Equations: Bisections Method, False Position Method, Newton's Raphson Method, Rate of convergence of Newton's method.

Interpolation and Extrapolation : Finite Differences, The operator E-Newton's Forward and Backward Differences, Newton's dividend differences formula, Lagrange's Interpolation formula for unequal Intervals, Gauss's Interpolation formula, Starling formula, Bessel's formula, Laplace,Everett formula.

UNIT-II

Numerical Differentiation Numerical Integration : Introduction, direct methods, maxima and minima of a tabulated function, General Quadratic formula, Trapezoidal rule, Simpson's One third rule, Simpson's three, eight rule.

UNIT-III

Solution of Linear Equation: Gauss's Elimination method and Gauss's Siedel iterative method.

Solution of Differential Equations: Euler's method, Picard's method, Fourth-order Ranga Kutta method.

Suggested Books:

1. Scarbourogh, "Numerical Analysis".
2. Gupta & Bose S.C. "Introduction to Numerical Analysis, "Academic Press, Kolkata, 3. S.S.Shashtri, "Numerical Analysis", PHI

DETAILED SYLLABUS
SECOND SEMESTER
Principles of Management

UNIT-I

Nature of Management: Meaning, Definition, it's nature purpose, importance & Functions, Management as Art, Science & Profession- Management as social System Concepts of management, Administration, Organization, Evolution of Management.

Functions of Management: Planning - Meaning - Need & Importance, type's levels, advantages & limitations. Forecasting - Need & Techniques Decision making – Types, Process of rational decision making & techniques of decision making Organizing.

UNIT-II

Elements of organizing & processes: Types of organizations, Delegation of authority - Need, difficulties in delegation - Decentralization Staffing - Meaning & Importance Direction, Nature, Principles Communication, Types & Importance Motivation, Importance, theories, Leadership - Meaning - styles, qualities & functions of leaders

UNIT-III

Functions of Management: Controlling - Need, Nature, importance, Process & Techniques Coordination - Need – Importance, Strategic Management Definition, Classes of Decisions, Levels of Decision, Strategy, Role of different Strategist, Relevance of Strategic Management and its Benefits Strategic Management in India.

Recent Trends in Management: Social Responsibility of Management – environment friendly management, Management of Change Management of Crisis Total Quality Management Stress Management International Management

Suggested Books:

1. Essential of Management - Horold Koontz and Iteinz Weibrich – McGraw hills International
2. Management Theory & Practice - J.N.Chandan
3. Essential of Business Administration - K. Aswathapa Himalaya Publishing House

THIRD SEMESTER

PAPER CODE: RB120301T

Computer Organization and Architecture

UNIT I

Computer Evolution: Brief history of Computer, Classification of Computer, Structure of a Computer System, Arithmetic Logic Unit, Control Unit, Von Neumann Architecture. Integer Addition and Subtraction ,Floating point representation., Signed numbers, Binary Arithmetic, 1's and 2's Complements , Booths Algorithm, Hardware Implementation, IEEE Standards, Floating Point Arithmetic , The accumulator, Shifts, Carry and Overflow. Instruction Characteristics, CPU with Single BUS, Types of Operands, Types of Operations, AddressingModes, Instruction Formats. **Processor Organization:** Parallelism and Computer arithmetic, Computer arithmetic associatively. Floating Point in the 8086, Programmers Model of 8086, Register Organization, 8086 Registers, Instruction Cycles, Addressing Modes. Micro operations, The Instruction cycle, Control of the CPU, Functional Requirements, Single, Two, Three bus structure, Execution of a complete instruction, Branching, Sequencing of Control Signals, Hardwired Control Unit, Micro- Programmed Control.

UNIT II

Memory Organization: Characteristics of Memory Systems, Main Memory, Types of Memory, Memory system considerations, Design of memory subsystem using Static, Dynamic Memory Chips, Memory interleaving **High Speed Memories:** Cache Memory, Structure of cache and main memory, Elements of Cache Design, Mapping functions, Replacement algorithms, ExternalMemory, Virtual memory

UNIT III

I/O Organization: Input / Output Module: Need, Techniques, Interrupt Driven I/O, Basic concepts of an Interrupt , Response of CPU to an Interrupt, Design Issues, Priorities, Interrupt handling, Types of Interrupts**.** Data Transfer Techniques, Data Memory Access, Buses, Types of buses, I/O Interface, Synchronous and Asynchronous Data Transfer, Serial I/O, Input Devices, Output Devices, Multiprogramming vs. Multiprocessing, Comparison between closely coupled and loosely coupled Multiprocessor

UNIT IV

Microprogramming: Basic Principles, Features , Hardwired vs. micro programmed computers, Applications and advantages of microprogramming, Limitations of microprogramming, Computer Clock, Micro Instructions and its Control Path, Microcode, Machine Instruction**.** Parallel Organization, Instruction Set Architecture (ISA), RISC and CISC, Characteristics of CISC, Characteristics of RISC, RISC versus CISC, Vector Processing Requirements and Characteristics ofvector processing.

Suggested Books:

1. Computer Organization & Architecture– by Stallings
2. Computer Organization and Architecture: Designing for Performance by William Stallings
3. Computer Architecture and Organization by John Hayes

THIRD SEMESTER

PAPER CODE: RB120302T

Operating System with the case study of UNIX & Windows

UNIT-I

Introduction: What is an operating system, Simple Batch Systems, Multi, programmed Batch systems, Time, Sharing Systems, Personal, Computer Systems, Parallel systems, Distributed systems, Real, Time Systems. Memory Organisation: Fixed memory, variable memory. Memory Management: Background, Logical versus physical Address space, swapping, Contiguous allocation, Paging, Segmentation Virtual Memory: Demand Paging, Page Replacement, Page, replacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing.

UNIT-II

Processes: Process Concept, Process Scheduling, Operation on Processes, CPU Scheduling: BasicConcepts, Scheduling Criteria, Scheduling Algorithms, Multiple, Processor Scheduling. Process Synchronization: Background, the Critical, Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock .

UNIT-III

Device Management: Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices, Input or Output Devices, Storage Devices, Buffering, Secondary Storage Structure: Disk Structure, Disk Scheduling, Disk Management**,** Swap, Space Management, Disk Reliability

Information Management: Introduction, A Simple File system, General Model of a File System, Symbolic File System, Basic File System, Access Control Verification, Logical File System, Physical File system File, System Interface, File Concept, Access Methods, Directory Structure, Protection, Consistency Semantics File, System Implementation: File, System Structure, Allocation Methods, Free, Space Management.

UNIT-IV

Unix: A Sample Login Session, Logging On, Using the On-line Man Pages, Logging Off,Directory and File Structure, File Names, Directories, The df Program, Your Login Directory, Subdirectories, Specifying Files, Protecting Files and Directories, Text Editors, Files as Output and Log Files, Logging Your Actions to a File, Comparing Files, Searching Through Files, The System and Dealing with Multiple Users.

Windows: features of windows desktop, start menu, control panel, my computer, windows explorer, accessories. Managing multiple windows, arranging icons on the desktop, creatingand managing folders, managing files and drives, logging off and shutting down windows. Entertainment CD Player, VD Player, Media Player, Sound Recorder, Volume Control

Suggested Books:

1. Silber sachatz and Galvin, “Operating System Concepts”, Person, 5th Ed. 2001
2. Madnick E., Donovan J., “Operating Systems:, Tata McGraw Hill, 2001
3. P C Software for Windows by R K Taxali
4. Unix Shell Programming” by Yashavant P Kanetkar

DETAILED SYLLABUS
THIRD SEMESTER
PAPER CODE: RB120303T
Data Base Management System

UNIT-I

Introduction: Database System Concepts, Database Users, DBMS Architecture, Characteristics of the Database Approach, Components of Database System, Advantages and disadvantages of Using a DBMS, Structure of DBMS, Database Schemas and Instances , Data Independence, Database Languages and Interfaces, Classification of Database Management Systems.

Entity Relationship Model: Entity Types, Entity Sets, Attributes, Keys, Relationships, Relationship Types, Roles, and Structural, Constraints, Weak Entity Types, ER Diagrams, Naming Conventions, Design Issues.

The Relational Data Model: Relational Constraints and the Relational Algebra: Relational Model Concepts, Relational Constraints and Relational Database Schemas Update Operations and Dealing with Constraint Violations, Basic Relational Algebra Operations, Additional Relational Operations, Examples of Queries in Relational Algebra.

UNIT-II

SQL:SQL and Database Design Theory and Methodology Structured Query Language The Relational Database Standard: Data Definition, Constraints and Schema Changes in SQL, Types of SQL Commands, SQL Operators and their Procedure, Insert, Delete, and Update Statements in SQL Queries and Sub Queries, Aggregate Functions, Joins, Unions, Intersection, Minus, Views (Virtual Tables) in SQL. Functional Dependencies and Normalization for Relational Databases: Informal Design Guidelines for Relation Schemas, Functional Dependencies, Armstrong Rules, Closure of Attributes, Normal Forms Based on Primary Keys, General Definitions of Second and Third Normal Forms, Boyce Codd Normal Form.

Transaction Processing: Concurrency Control and Distributed Database Transaction Processing Concepts: Introduction to Transaction Processing, Transaction and System Concepts, Desirable Properties of Transactions, Concurrency Control Techniques, Locking Techniques for Concurrency Control, Concurrency Control Based on Timestamp Ordering.

Suggested Books:

1. A.K. Majumdar, P. Bhattacharya, “Database Management Systems”, TMH, 1996.
2. Bipin Desai, “An Introduction to database systems”, Galgotia Publications, 1991

DETAILED SYLLABUS
THIRD SEMESTER
PAPER CODE: RB120304T

Statistical Method and Application

UNIT I

Classification of data, Tabulation of data, Preparation of frequency distribution, Presentation ofdata through histogram, frequency polygon, frequency curve

UNIT II

Measures of Central Tendency: Computation of Arithmetic mean, median and modefor ungrouped data and grouped data, Verification of median through ogives.

Measures of dispersion: Computation of Range, Quartile deviation, mean deviation andStandard deviation, coefficient of variation. (Numerical Applications Only)

UNIT III

Concept of Skewness, Karl Pearson's and Bowley's Coefficients of Skewness(NumericalApplications Only)

Meaning of Correlation, types of correlation, correlation coefficient, Karl Pearson, spearman's rank correlation coefficient. (Numerical Applications Only)

Suggested Books:

1. Statistical Methods,"Dr. S. P. Gupta, SultanChand&Sons".
2. Quantitative Techniques by "C. Sathyadevi,S. Chand".
3. Fundamental of Mathematical Statistics,"S.C.Gupta& V.K.Kapoor, Sultan Chand"
4. Statistical Methods, "Snedecor G.W. & Cochran W. G. oxford &+DII"
5. Elements of Statistics, "Mode.E.B., PrenticeHall"

DETAILED SYLLABUS
THIRD SEMESTER
E-Commerce and ERP

UNIT-I

Introduction: Defining E-Commerce, Main Activities of Electronic Commerce, Benefits of E-Commerce, Goals of Electronic Commerce, Main Components of E- Commerce, Functions of Electronic Commerce, Communication, Process Management, Service Management, Transaction Capabilities, Process of E- Commerce, Types of E-Commerce, Role of Internet and Web in E- Commerce, Technologies Used in E- Commerce Systems, Scope of E-Commerce, E- Business Models.

E-Commerce Activities: Various Activities of E- Commerce, Various Modes of Operation Associated with E-Commerce, Matrix of E- Commerce Types, Elements and Resources Impacting E- Commerce and Changes, Types of E- Commerce Providers and Vendors, Man Power Associated with E- Commerce Activities, Opportunity Development for E- Commerce Stages, Development of E- Commerce Business Case, Components and Factors for the Development of the Business Case, Steps to Design and Develop an E- Commerce Website.

UNIT -II

Internet :The Backbone for E- Commerce: Early Ages of Internet, Networking Categories, Characteristics of Internet, Components of Internet, Internet Services, Elements of Internet, Uniform Resource Locators, Internet Protocol, Shopping Cart, Cookies and E- Commerce, Web Site Communication, Strategic Capabilities of Internet. Implementation of E- Commerce: WWW.EBAY.COM, B2C Website- Registration, Time factor, Bidding process, Growth of eBay, PayPal, New Trend in Making Payments Online- National Electronic Funds Transfer.

UNIT-III

ISP, WWW and Portals: Internet Service Provider (ISP), World Wide Web (WWW), Portals, Steps to build homepage, Metadata, Advantages of Portal, Enterprise Information Portal (EIP). E-Marketing, Meeting the needs of website visitors, Maintaining a Website, Metrics Defining Internet Units of Measurement, Online Marketing, Advantages of Online Marketing, Advantages of Online Marketing. E- Security, E- Business Risk Management Issues, Firewall, Network policy, Advanced authentication mechanism, Packet filtering, Application gateways, Defining Enterprise Wide Security Framework. E- Payment Systems, Customer Relationship Management, Decision support tools, Higher level statistical analysis, Forecasting and planning tools, True channel management, Workflow management, Collateral management, Electronic Customer Relationship Management, Need, Architecture and Applications of Electronic CRM.

Suggested Books:

1. The Story of India's First E-Commerce Company" by K Vaitheeswaran"
2. E – Commerce: Strategy, Technologies and Applications" by David Whiteley"
3. E-Commerce: An Indian Perspective" by P T Joseph"

DETAILED SYLLABUS
FOURTH SEMESTER
PAPER CODE: RB120401T
Java Programming

UNIT-I

Introduction, Java Tokens, Java Statements, Command Line Arguments, Programming Style. Constants, Variables and Data Types Constants, Variables, Data Types, Declaration of Variables,Giving Values of Variables, Scope of Variables, Symbolic Constants, Type Casting, Getting Valuesof Variables, Standard Default Values, Java Program Structure, Java Virtual Machine.

Operators, Expressions and Statements: Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators, Arithmetic Expressions, Evolution of Expressions, Precedence of Arithmetic Operators. Decision Making and Branching: Introduction, Decision Making with if Statement, Simple if Statement, The if... else Statement, Nesting of if ... else Statements, else if Ladder, switch Statement, ?: Operator. Decision Making and Looping: Introduction, while Statement, do Statement, for Statement.

UNIT-II

Classes, Objects and Methods: Defining a Class, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting of Methods, Inheritance:Extending a Class, Overriding Methods, final Variables and Methods, Final Classes, Finalize Methods, Abstract Methods and Classes, Visibility Control. Arrays, One, Dimensional Arrays, Creating an Array, Two Dimensional Arrays, Strings, Vectors, Wrapper Classes.

UNIT-III

Interfaces and Packages: Introduction, Defining Interfaces, Extending Interfaces, implementing Interfaces, Accessing Interface Variables. Packages: Introduction, Java API Packages, Using system Packages, Naming Conventions, Creating Packages, Accessing a Packages, Using a Package, Adding a Class to a Package, Hiding Classes. Multithreaded Programming: Introduction, Creating Threads, Extending the Thread Class, Stopping and Blocking a Thread, Life Cycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, and Synchronization.

UNIT-IV

Applet Programming: Introduction, How Applets Differ from Application, 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, More About Applet Tag. Managing Errors and Exceptions: Introduction, Types of Errors, Exceptions, Syntax of Exception Handling Code, Multiple Catch Statements, Using finally Statement, Throwing Our Own Exceptions, Using Exceptions for Debugging.

Suggested Books:

1.E. Balagurusamy, Programming with Java, A Primer Second Edition, Tata McGraw Hill, NewDelhi.
2.P.Naughton and H. Schildt, JAVA: The Complete Reference, TMH, New Delhi 2005.
3.D.Jana, Java and Object Oriented Programming Paradigm, PHI, New Delhi, 2005

DETAILED SYLLABUS
FOURTH SEMESTER
PAPER CODE: RB120402T
Web Technology using PHP and MYSQL

UNIT I

PHP: Introduction to PHP Evaluation of PHP, Basic Syntax, Defining variable and constant, PHP Data type, Operator and Expression. Decisions and loop Making Decisions, Doing Repetitive task with looping, Mixing Decisions and looping with Html. Function: Define a function, Call by value and Call by reference, Recursive function, String Creating and accessing, String Searching & Replacing String, Formatting String, String Related Library function.

UNIT II

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. Handling Html Form with PHP Capturing Form, Data Dealing with Multi-value filed, and Generating File uploaded form, redirecting a form after submission.

UNIT III

Working with file and Directories: Understanding file& directory, Opening and closing, a file, Coping, renaming and deleting a file, working with directories, Creating and deleting folder, File Uploading & Downloading.

UNIT IV

Session and Cookie: Introduction to Session Control, Session Functionality What is a Cookie, Setting Cookies with PHP. Using Cookies with Sessions, Deleting Cookies, Registering Session variables, Destroying the variables and Session. 8. Database 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.) Exception Handling Understanding Exception and error, Try, catch, throw. Error tracking and debugging.

Suggested Books:

1. Learning PHP, MySQL, books by “O riley Press”.
2. Beginning PHP and MySQL by” W. Jason Gilmore”

DETAILED SYLLABUS
FOURTH SEMESTER
Paper Code: RB120403T
Computer Network

UNIT I

Introduction: Definition of a Computer Network, Components of a computer network**,** Types of Network: Based on Topology (Bus, Star, Ring Mesh, Tree), Based on Size Technology and ownership (LAN, MAN, WAN). Network topologies, Linear Bus Topology, Ring Topology, Star Topology, Hierarchical or Tree Topology, Topology Comparison, Considerations when choosing a Topology: Switching, Circuit switching, Message switching, Packet switching, Implementation of packet switching, Relationship between Packet Size and Transmission time, Comparison of switching techniques: Multiplexing, FDM, Frequency division multiplexing, WDM, Wavelength division multiplexing, TDM, Time division multiplexing.

Network Software & Network Standardization: Introduction: Networks Software, Protocol hierarchy, Design issues for the layers, Merits and De-merits of Layered Architecture, Service Primitives: Reference models, The OSI Reference Model, The TCP/IP Reference Model, Comparison of the OSI & the TCP/IP Reference Model

UNIT II

Data Link Layer: Services provided to the Upper Layer, Framing, Error Control, Flow Control, IEEE Standards for MAC Sub layer, Network Layer: Services provided to the Upper Layer: Routing Algorithms (Centralized, Distributed), Congestion Control (Token Based and Non Token Based), Internetworking.

Data Communications: **Introduction:** Theoretical basis for communication, Fourier analysis, Band limited signals, Maximum data rate of a channel: Transmission impairments, Attenuation distortion, Delay distortion, Dispersion, Noise: Data transmission modes, Serial & Parallel, Simplex, Half duplex & full duplex, Synchronous & Asynchronous transmission:

Transmission Medium: Introduction: Transmission medium, Guided & Unguided Transmission medium, Twisted pair, Coaxial cable, Optical fiber, Comparison of fiber optics and copper wire: Wireless transmission.

Suggested Books:

1. W. Stallings, “Data and Computer Communication”, Pearson Education.
2. A. S. Tanenbaum, “Computer Network”, 4th, Edition, Pearson Education.
3. Forouzan, “Data Communication and Networking”, 2nd Edition, Tata McGraw Hill.

DETAILED SYLLABUS
FOURTH SEMESTER
PAPER CODE: RB120404T

Optimization Techniques

UNIT-I

Basics of operation research (OR): Characteristics of OR, Necessity of OR in industry, OR and decision making, role of computers in OR. Linear Programming: Formulations and graphical solution of (2 variables) canonical and standard terms of linear programming problem.
Algebraic solution: Simplex methods, Charnes method of penalties, two phase simplex method.

UNIT-II

Transportation Model: Definition, formulation and solution of transportation models, The row, minima, column, minima, matrix, minima and Vogel's approximation methods. Assignment model: Definition of assignment model, comparison with transportation model, formulationand solution of assignment model.

UNIT-III

Sequencing Problem: Processing of n jobs through 2 machines, processing n jobs through 3 machines, processing 2 jobs through m machines.

Game Theory: Characteristics of games, maxima, minimax criteria of optimality, dominance property, algebraic and graphical method of solution of solving 2 x 2 games.

Suggested Books:

1. Introduction to Management Science Operations Research,"KantiSwarup".
2. Operations Research Quantitative Techniques For Management,"V. K. Kapoor".
3. Nonlinear Programming: Theory and Algorithms "by Mokhtar S Bazara and C M Shetty".

DETAILED SYLLABUS
FIFTH SEMESTER
PAPER CODE: RB120501T

Network Security

UNIT-I

Network Security: Introduction: OSI Security Architecture-Classical Encryption techniques Cipher Principles, Data Encryption Standard, Block Cipher Design Principles and Modes of Operation.

Public Key Cryptography: Key Management, Diffie Hellman key Exchange-Elliptic Curve Architecture and Cryptography, Introduction to Number Theory, Confidentiality using Symmetric Encryption, Public Key Cryptography and RSA.

UNIT-II

Authentication and Hash Function: Authentication requirements, Authentication functions – Message Authentication Codes, Hash Functions, Security of Hash Functions and MACs, MD5 message Digest algorithm, Secure Hash Algorithm, RIPEMD, HMAC Digital Signatures, Authentication Protocols, Digital Signature Standard

UNIT-III

Network Security: Authentication Applications: Kerberos, X.509 Authentication Service, Electronic Mail Security, PGP, S/MIME, IP Security, Web Security.

UNIT-IV

System Level Security: Intrusion detection, password management, Viruses and related Threats, Virus Counter measures, Firewall Design Principles, Trusted Systems.

Suggested Books:

1. William Stallings, “Cryptography and Network Security, Principles and Practices ", Prentice Hall of India, Third Edition,2003.
2. Atul Kahate-“Cryptography and Network Security ",Tata McGraw,Hill,2003.
3. Bruce Schneier, “Applied Cryptography", John Wiley & Sons Inc, 2001.

FIFTH SEMESTER
PAPER CODE: RB120502AT

Design and Analysis of Algorithm

UNIT-I

Basic Concepts of Algorithms: Definition of algorithm, Characteristic of algorithm, Pseudo Codes &Time Complexity of Basic Control Structures, Time and Space Complexity of Insertion Sort, Selection Sort, Heap Sort , Bubble Sort, Asymptotic Notations (Growth of Functions).

UNIT-II

Divide and conquer: Binary Search, Maximum & Minimum, Merge Sort, Quick Sort, Greedy Method: General method, Knapsack Problem, Job Sequencing with deadline- Optimal Storage on tapes, Huffman Codes.

UNIT-III

Dynamic Programming: Matrix, Chain Multiplications, Longest Common Subsequence- Backtracking: General method, N Queens Problem, Sum of subsets.

UNIT-IV

Basic Traversals and search techniques, techniques of binary trees, techniques of graphs: BFS, DFS.

Analysis of Graph Algorithms: Elementary Graph Algorithms, Multistage Graphs, Minimum Spanning Trees: Kruskal's & Prim's Algorithm, Single Source Shortest Path, Dijkstra's & Bellman Ford, All Pairs Shortest Path: Warshal Algorithm.

Suggested Books:

1. Thomas H. Coremen, "Introduction to Algorithms", PHI.
2. Horowitz & Sahani,"Fundamental of Algorithms", Galgotia.
3. Aho,"Design & Analysis of Computer Algorithms", Pearson.
4. Johnson baugh, "Algorithms", Pearson.

DETAILED SYLLABUS
FIFTH SEMESTER
PAPER CODE: RB120502BT

Mobile Application Development using Android

UNIT-I Introduction to Android: - Overview, History, Features of Android, The Android Platform, Understanding the Android Software Stack – Android Application Architecture –The Android Application Life Cycle – The Activity Life Cycle, Creating Android Activity -Views- Layout Android SDK, Android Installation, Building you First Android application, Understanding Anatomy of Android Application, Android Manifest file.

UNIT-II

Android Application Design Essentials: Anatomy of an Android applications, Android terminologies, Creating User Interfaces with basic views- Application Context, Activities, Services, Intents, linking activities with Intents,, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions.

UNIT-III

Android User Interface Design Essentials: User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation. Layouts, Recycler View, List View, Grid View and Web view Input Controls: Buttons, Checkboxes, Radio Buttons, Toggle Buttons, Spinners, Input Events, Menus, Toast, Dialogs, Styles and Themes, Creating lists, and Custom lists

UNIT-IV

Testing Android applications: Publishing Android application, Using Android preferences, Managing Application resources in a hierarchy, working with different types of resources.

Using Common Android APIs: Internal Storage, External Storage , SQLite Databases , Managing data using Sqlite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, JSON Parsing, Using Android Telephony APIs, Deploying Android Application to the World. Google maps, Using GPS to find current location, Sensors, bluetooth/Wi-Fi Connectivity.

REFERENCE BOOKS:

1. Reto Meier, “Professional Android 2 Application Development”, Wiley India Pvt Ltd
2. Mark L Murphy, “Beginning Android”, Wiley India Pvt Ltd
3. “Android Application Development All in one for Dummies” by Barry Burd, Edition: I
4. “Android”, Dixit, Prasanna Kumar Vikas Publications, New Delhi 2014, ISBN: 9789325977884
5. Maclean David, Komatineni Satya,Allen Grant , “Pro Android 5”, Apress Publications2015 ISBN: 978-1-4302-4680-0
6.” Android Programming for Beginners” by Hortan, John, Packet Publication, 2015 ISBN: 978-1-78588-326-2
7. Lauren Darcey and Shane Conder, “Android Wireless Application Development”, Pearson Education, 2nd ed. (2011)

DETAILED SYLLABUS FIFTH SEMESTER PAPER CODE: RB120503T

System Analysis and Design

UNIT-I

Overview of Systems Concepts, Analysis and Design Life cycle, Introduction to System Concept: Characteristics of the system, Elements of a System, Types of Systems, Physical and Abstract System, Open and Closed System, Formal and Informal System, Introduction to Data And Information: Types of Information System, Categories of Information System, Needs of Information Systems, Qualities of Information System, Software Development Life Cycle (SDLC), Role and Attributes of System Analyst.
System Planning and Requirements Determination System planning and initial investigation: Strategic Plan for Information processing, Tools for Planning, Problems in Planning, Need for requirement definition.

Information gathering tools: Review of Literature, procedures and forms, Methodologies, Tools and Techniques of Analysis Systems Analysis and Design: Decision Tree, Data Dictionary, Decision Table, Structured English, Data Flow Diagram, Context Diagram, Levelling a DFD, Feasibility Study.

UNIT-II

System Design and Implementation Process of Design: Logical and Physical Design, DesignMethodologies, Elements of Form Design, Design of Output, Design of Input, Design of File, Design of procedure, Audit Trail, System Implementation and Testing: Operational and Test Environment, Conversion Preparation, Database installation, Users Training and Final Report to Management, Creating a new System, Test Plan: Activity Network for system Testing, Types of Testing. System Quality Assurance, Quality factors specifications.

Suggested Books:

1. V.Rajaraman, Analysis and Design of Information System, Pearson Education, 1991.
2. J.A. Senn, “Analysis and Design of Information Systems”
3. J.K.Whiten, L.D.Bentley, V.M.Beslow, “System Analysis and Design Methods”,

DETAILED SYLLABUS FIFTH SEMESTER PAPER CODE: RB120504

Computer Graphics

UNIT I

Introduction: The Advantages of Interactive Graphics, Representative Uses of Computer Graphics, Classification of Application Development of Hardware and software for computer Graphics, Conceptual Framework for Interactive Graphics: Overview, Scan Converting Lines, Scan Converting Circles, Scan Converting Ellipses.

Hardcopy Technologies, Display Technologies, Raster, Scan Display System, Video Controller, Random, Scan Display processor, Input Devices for Operator Interaction, Image Scanners, Working exposure on graphics tools like Dream Weaver, 3D Effects etc, Clipping Southland, Cohen Algorithm, Cyrus, Beck Algorithm, Midpoint Subdivision Algorithm

UNIT II

Geometrical Transformation: 2D Transformation, Homogeneous Coordinates and Matrix Representation of 2D Transformations, composition of 2D Transformations, the Window to Viewport Transformations, Introduction to 3D Transformations Matrix.
Representing Curves & Surfaces: Polygon meshes parametric, Cubic Curves, Quadric Surface. Solid Modeling: Representing Solids, Regularized Boolean Set Operation primitive Instancing Sweep Representations, Boundary Representations, Spatial Partitioning Representations,Constructive Solid Geometry Comparison of Representations.
Multimedia Definition, CD-ROM and the multimedia highway, Computer Animation (Design, types of animation, using different functions) , Introduction to making multimedia, The stage of Project, hardware & software requirements to make good multimedia skills and Training opportunities in Multimedia Motivation for Multimedia usage

Suggested Books:

1. Foley, Van Dam, Feiner, Hughes, Computer Graphics Principles& practice,2000.
2. D.J. Gibbs & D.C. Tsichritzs: Multimedia programming Object Environment & Frame work,2000.
3. D. Haran & Baker. Computer Graphics Prentice Hall of India, 1986

DETAILED SYLLABUS
SIXTH SEMESTER
PAPER CODE: RB120601T

CYBER LAW AND INTERNET SECURITY

Unit-1

Cyber Space Jurisdiction: Jurisdiction issues under IT Act, 2000, traditional principals of jurisdiction, extra-terrestrial jurisdiction and case laws on cyber space jurisdiction. E–commerce and Laws in India: Digital / Electronic signature in Indian laws, E–commerce; issues and provisions in Indian law, and E –Governance.

Unit-2

Intellectual Property Rights, Domain Names and Trademark Dispute: Concept of trademarks in internet era, cybersquatting, reverse hijacking, jurisdiction in trademark disputes, copyright in the digital medium, and copyright in computer programs

Unit-3

Developing Secure Information Systems: Information security governance & risk management, security architecture & design security issues in hardware, data storage & downloadable devices, physical security of IT assets, access control, CCTV and intrusion detection systems and backup security measures.

Unit-4

Security Policies: Development of policies, WWW policies, email security policies, policy review process-corporate policies-sample security policies, publishing and notification requirement of the policies.

Text Books:

1. Prashant Mali, “Cyber Law & Cyber Crimes”, Snow White publications, Mumbai.
2. Dr. Surya Prakash Tripathi, Ritendra Goyal and Praveen Kumar Shukla, “Introduction to Information Security and Cyber Law”, Willey Dreamtech Press.
3. Sarika Gupta & Gaurav Gupta, “Information Security and Cyber Laws”, Khanna Publishing House. Reference
4. Farooq Ahmad “Cyber Law in India”, Pioneer Publications.
5. Vakul Sharma, “Information Technology Law and Practice”, Universal Law Publishing Co. Pvt. Ltd.
6. Suresh T. Vishwanathan, “The Indian Cyber Law”, Bharat Law House New Delhi.

FOURTH SEMESTER PAPER

CODE: RB120602T

Artificial Intelligence

UNIT-I

AI Concepts, Various definitions of AI, Knowledge, Knowledge Pyramid, People and Computers: What computers can do better that people, what people can do better than computers, Characteristics of AI Problems, Problem Representation in AI, Components of AI, AI Evolution, Application Areas of AI, History of AI, The Turing Test and The Revised Turing Test.

UNIT-II

Expert System: Components of Expert System: Knowledge Base, Inference Engine, User Interface, Features of Expert System, Expert System Life Cycle, Categories of Expert System, Rule Based vs. Model Based Expert Systems, Advantages/Limitations of Expert System, Developing an Expert System: Identification, Conceptualization, Formalization, Implementation, Testing, Using an Expert System, Application Areas of Expert System

AI and Search Process: Brute Force Search, Depth First/Breadth First Search, Heuristic Search: Hill Climbing, Constraint Satisfaction, Mean End Analysis, Best First Search, A* Algorithm, AO* Algorithm, Beam Search.

UNIT-IIII

Natural Language Processing: Introduction, Need, Goal, Fundamental Problems in Natural Language Understanding, How People overcome Natural Language Problems, Speech Recognition: Introduction, Advantages and Approaches, Introduction to Robotics: Parts of a Robot, Controlling

UNIT-IV

Applications: Communication ,Communication as action, Formal grammar for a fragment of English, Syntactic analysis, Augmented grammars, Semantic interpretation, Ambiguity and disambiguation, Discourse understanding, Grammar induction, Probabilistic language processing, Probabilistic language models, Information retrieval, Information Extraction,Machine Translation.

Suggested Books:

1. V S Janakiraman, “Foundation of Artificial Intelligence and Expert Systems”
2. Dan W. Patterson, “Introduction to Artificial Intelligence and Expert Systems”

DETAILED SYLLABUS
SIXTH SEMESTER
PAPER CODE: RB120603T

Visual Basic.NET

UNIT-I

Visual Basic .NET and the .NET Framework: Introduction to .net framework ,Features, Common Language Runtime (CLR) ,Framework Class Library(FCL).Visual Studio.Net – IDE, Languages Supported, Components. Visual Programming, VB.net, Features, IDE, Menu System, Toolbars, Code Designer, Solution Explorer, Object Browser, Toolbox, Class View Window, Properties Window, Server Explorer, Task List, Output Window, Command Window.

Elements of Visual Basic .net: Properties, Events and Methods of Form, Label, Text Box, List Box, Combo Box, Radio Button, Button, Check Box, Progress Bar, Date Time Picker, Calendar, Picture Box, HScroll bar, VScroll Bar, Group Box, Tool Tip, Timer.

Programming in Visual basic .net: Data Types, Keywords, Declaring Variables and Constants, Operators, Understanding Scope and accessibility of variables, Conditional Statements, If- then, If- then- else, Nested If, Select Case, Looping Statement, Do loop, For Loop, For Each, NextLoop, While Loop, Arrays, Static and Dynamic.

UNIT-II

Functions, Built-In Dialog Boxes, Menus and Toolbar: Menus and toolbars, Menu Strip, Tool Strip, Status Strip, Built-In Dialog Boxes – Open File Dialogs, Save File Dialogs, Font Dialogs, ColorDialogs, Print Dialogs, Input Box, MsgBox, Interfacing With End user, Creating MDI Parent and Child, Functions and Procedures, Built-In Functions, Mathematical and String Functions, User Defined Functions and Procedures.

Advanced Concepts in VB.Net: Object Oriented Programming, Creating Classes, Objects, Fields, Properties, Methods, Events, Constructors and destructors, Exception Handling, Models, Statements, File Handling, Using File Stream Class, File Mode, File Share, File Access Enumerations, Opening or Creating Files with File Stream Class, Reading and Writing Text using Stream Reader and Stream Writer Classes, Data Access with ADO.Net – What are Databases? Data Access with Server Explorer, Data Adapter and Data Sets, ADO.NET Objects and Basic SQL.

Suggested Books:

1. Jesse liberty :"Learning Visual Basic.net"
2. Steven Holzner: " VB.NET BlackBook "
3. Chuck Easttom: " Learn VB.NET"

DETAILED SYLLABUS

SIXTH SEMESTER

PAPER CODE: RB120604AT

Data Mining and Ware Housing

Unit-1 Introduction: Data mining-definition & functionalities, data processing, form of data pre-processing, data cleaning: missing values, noisy data, binning, clustering, regression, inconsistent data, data integration and transformation, and data reduction.

Concept Description: Association rule mining, mining single-dimensional Boolean association rules from transactional databases, Apriori Algorithm, Classification and Predictions: Decision tree, Bayesian Classification, and K-nearest neighbour classifiers.

Unit-2

Data Warehousing: Overview, definition, delivery process, difference between database system and data warehouse, multi-dimensional data model, data cubes, stars, snowflakes, fact constellations, concept hierarchy, process architecture, 3 tier architecture, and data mart.

OLAP: Aggregation, historical information, query facility, OLAP function and tools. OLAP servers, ROLAP, MOLAP, HOLAP, data mining interface, security, backup and recovery.

Reference Books:

1. M. H. Dunham, “Data Mining: Introductory and Advanced Topics”, Pearson Education.
2. Jiawei Han, Micheline Kamber, “Data Mining Concepts & Techniques”, Elsevier.
3. Ian H. Witten, “Data Mining: Practical Machine Learning Tools and Techniques”, Morgan Kaufmann
4. Sam Anahory, Dennis Murray, “Data Warehousing in the Real World: A Practical Guide for Building Decision Support Systems”, Pearson Education.
5. Mallach, “Data Warehousing System”, McGraw –Hill.
6. Alex Berson and Stephen J. Smith, "Data Warehousing, Data Mining, & OLAP", Tata McGraw-Hill Education