

**SCHEME FOR BACHELOR OF COMPUTER APPLICATIONS (BCA)
FIFTH SEMESTER SYLLABUS for
(2005 - 2008) and (2006-2009) BATCH
(REVISED on 31st uly 2007)**

THIRD YEAR

SEMESTER V

| SUBJECT CODE | SUBJECT NAME | Marks |
|--------------|---|-------|
| 5BCA1 | COMPUTER NETWORKS | 100 |
| 5BCA2 | JAVA PROGRAMMING | 100 |
| 5BCA3 | A. LINUX AND SHELL PROGRAMMING OR B. EMBEDDED SYSTEMS | 100 |
| 5BCA4 | <u>FOR COMPUTER (REGULAR) STREAM</u> A. SOFTWARE ENGINEERING OR B. FUNDAMENTALS OF MATHEMATICS-IV (COUNTING PRINCIPLES, PROBABILITY AND STATISTICS) FOR ALL OTHER STREAM AS SPECIFIED EARILER IN THE PRINTED SYLLABUS | 100 |
| 5BCA5 | <u>FOR COMPUTER (REGULAR) AND COMMERCE STREAM</u> 5BCA5 (A) & 5BCA5 (D) ASP.NET AND C# FOR ALL OTHER STREAMS AS SPECIFIED EARILER IN THE PRINTED SYLLABUS | 100 |

**SEMESTER VI -
6 MONTH'S PROJECT WORK**

PRACTICAL & CONTINUOUS EVALUATION

SEMESTER IV

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|-------|--|-----|
| 5BCA6 | INTERNAL ASSESSMENT AND TERM WORK | 100 |
| 5BCA6 | COMPUTER LAB IX:JAVA | 100 |
| 5BCA7 | COMPUTER LAB X: FOR COMPUTER(REGULAR)/COMMERCE STREAMS ASP.NET AND C# + Linux Shell Prog. FOR MATHS & MANAGEMENT STREAMS Linux & Shell Programming | 100 |
| 5BCA8 | PROFESSIONAL PERSONALITY SKILLS | 50 |

5BCA1-COMPUTER NETWORKS**UNIT-I**

Needs and Advantages - network, Types-server based, peer, hybrid, Server types, Network Topology-Bus, Star, Ring, Star bus, Star ring, Mesh, Network Protocols-Hardware Protocols, software Protocols, Selecting and design the network for an organization

UNIT-II

Signal Transmission-Digital signaling, Analog Signaling, Bit synchronization, Baseband and Broadband transmission, Network Media types- properties & specialties, comparative study, Network adapters – working principals, configuration and selection

UNIT-III

OSI and IEEE 802model,Ethernet – working principal, 10 & 100 MBPS Ethernet, Token Ring working principle, cabling, Hops, FDDI, Apple talk & ARCnet-Working and their components, Network Scaling-No. of computers, distance, software, speed, special requirements

UNIT-IV

Networking Technologies- Fiber Channel, ATM, Network connectivity – Hubs, repeaters, bridges, multiplexers, Internet connectivity – Routers and Brouters, gateways, CSUs/DSUs

UNIT -V

Various Server & Clients Hardware & software, Simple Installation and configuration of Windows NT, Novell NetWare-Server and clients. Simple network administration.

TEXT & REFERENCE BOOKS :

- ❑ James Chellis Charles Perkins, Matthew Strebe “Networking Essentials:Study Guide MCSE”, Second Edition, BPB Publications.
- ❑ S.K.Basandra & S. Jaiswal, “Local Area networks”, Galgotia Publications
- ❑ Gerd E. Keiser, “Local Area networks”
- ❑ Andrew & Tanenbaum, “Computer Network ”
- ❑ William Stallings, “Data and Computer Communication”
- ❑ Prakash C Gupta, “Data Communication”

5BCA2 – JAVA PROGRAMMING**UNIT-I**

C++ Vs JAVA, JAVA and Internet and WWW, JAVA support systems, JAVA environment.

JAVA program structure, Tokens, Statements, JAVA virtual machine, Constant & Variables, Data Types, Declaration of Variables, Scope of Variables, Symbolic Constants, Type Casting.

Operators : Arithmetic, Relational, Logical Assignments, Increment and Decrement, Conditional, Bitwise, Special, Expressions & its evaluation.

If statement, if...else... statement, Nesting of if...else... statements, else...if Ladder, Switch, ? operators, Loops – While, Do, For, Jumps in Loops, Labelled Loops.

UNIT-II

Defining a Class, Adding Variables and Methods, 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.

UNIT-III

Arrays: One Dimensional & two Dimensional, strings, Vectors, wrapper Classes, Defining Interface Extending Interface, Implementing Interface, Accessing Interface Variable, System Packages, Using System Package, Adding a Class to a Packages, Hiding Classes.

UNIT-IV

Creating Threads, Extending the Threads Class, Stopping and Blocking a Thread, Life Cycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization, Implementing the Runnable Interface.

UNIT-V

Local and Remote Applets Vs Applications, Writing Applets, Applets Life Cycle, Creating an Executable Applet, Designing a Web Page, Applet Tag, Adding Applet to HTML File, Running the Applet, Passing Parameters to Applets, Aligning the Display, HTML Tags & Applets, Getting Input from the User.

TEXT & REFERENCE BOOKS:

- E. Balaguruswamy, "Programming in Java", 2nd Edition, TMH Publications
- Peter Norton, "Peter Norton Guide to Java Programming", Techmedia Publications

**5BCA-3(A) – LINUX AND SHELL PROGRAMMING****UNIT – I**

Linux introduction and file system - Basic Features, Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell. Linux File system-Boot block, super block, Inode table, data blocks, How Linux access files, storage files, Linux standard directories. Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons – cmp & comm, View files, disk related commands, checking disk free spaces. Partitioning the Hard drive for Linux, Installing the Linux system, System startup and shut-down process, init and run levels.

UNIT-II

Essential linux commands Understanding shells, Processes in linux-process fundamentals, connecting processes with pipes, tee, Redirecting input

output, manual help, Background processing, managing multiple processes, changing process priority with nice, scheduling of processes at command, cron, batch commands, kill, ps, who, sleep, Printing commands, find, sort, touch, file, file related commands-ws, sat, cut, dd, etc.

Mathematical commands- bc, expr, factor, units. Creating and editing files with vi, joe & vim editor

UNIT-III

System administration Common administrative tasks, identifying administrative files – configuratinn and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disable user's accounts, creating and mounting file system, checking and monitoring system performance file security & Permissions, becoming super user using su.

Getting system information with uname, host name, disk partitions & sizes, users, kernel.

Backup and restore files, reconfiguration hardware with kudzu, installaing and removing packages with rpm command.

Configure X-windows desktop-redhat-config-Xfree86, understanding XF86config file, starting & using X desktop. KDE & Gnome graphical interfaces, changing X settings.

UNIT-IV

Shell programming- Basic of shell programming, Various types of shell available in Linux, comparisons between various shells, shell programming in bash, read command, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, system shell variables, shell keywords, Creating Shell programs for automate system tasks.

UNIT-V

Simple filter commands – pr, head, tail, cut, paste, sort, uniq, tr. Flter using regular expressions – grep, egrep, and sed. awk programming – report printing with awk.

TEXTS & REFERENCES BOOKS :

- **UNIX – Concepts & Applications (Third Ed.)** – Sumitabha Das, Tata McGraw Hill Publications.
- **Unix for programmers and users (Third Ed.)** – Graham Glass & King Ables, Pearson Education India. (Low Prices Edition).
- **Red Hat Linux 9 Bible** – Cristopher Negus, IDG Books India Ltd.



5BCA-3(B) – EMBEDDED SYSTEMS**UNIT - 1**

Introduction to Embedded Systems: An Embedded System, Processor in the System, Other Hardware Units, Software Embedded into a System, Exemplary Embedded Systems, Embedded System-On-Chip (SOC) and in VLSI Circuit.

UNIT-2

Processor and Memory Organization: Structural Units in a Processor, Processor Selection for an Embedded System, Memory Devices, Memory Selection for an Embedded System, Allocation of Memory to Program Segments and Blocks and Memory Map of a System, Direct Memory Access, Interfacing Processor, Memories and I/O Devices.

UNIT-3

Devices and Buses for Device Network: I/O Devices, Timer and Counting Devices, Serial Communication Using the I²C, 'CAN' and Advanced I/O Buses between the Networked Multiple Devices, Host System or Computer Parallel Communication between the Networked I/O Multiple Devices Using the ISA, PCI, PCI-X and Advanced Buses.

UNIT - 4

Device Drivers and Interrupts Servicing Mechanism: Device Drivers, Parallel Port Device Drivers in a System, Serial Port Device Drivers in a System, Device Drivers for Internal Programmable Timing Devices, Context and the Periods for Context-Switching, Deadline and Interrupt Latency.

UNIT - 5

Programming Concepts and Embedded Programming in C and C++ : Software Programming in Assembly Language(ALP) and in High Level Language'C', 'C' Program Elements: Header and Source Files and Preprocessor Directives, Program Elements: Macros and Functions, Program Elements: Data Types, Data Structures Modifiers, Statements, Loops and Pointers, Queues, Stacks, Lists and Ordered Lists, Embedded Programming in C++, Embedded Programming in Java, 'C' Program Compiler and Cross-Compiler, Source Code Engineering Tools for Embedded C/C++, Optimisation of Memory Needs.

Real Time and Embedded System Operating System- necessity, features and qualities.

TEXT & REFERENCE BOOK :

- Embedded Systems : Architecture, Programming and Design by Raj Kamal, Tata McGraw Hill Publications.

**5BCA 4(A) - SOFTWARE ENGINEERING****UNIT-I**

Software: Software: Characteristic, components & application, Software Engineering - A Layered Approach, Software Process Software Process Models: Software Process Models: Linear Sequential Model, Prototype Model, Incremental Model & Spiral Model, Project Management Concepts: Project Management Concepts: People, Problem & Process Software Process & Project Metrics: Software Process & Project Metrics: Metrics in the process & project domains, Software measurement - Size Oriented Matrices, Function-Oriented Metrics, Extended Function Point Metrics, Metrics for software quality, integration metrics within the software process

UNIT-II

Software project planning: project planning objectives, Software scope, Resources - Human Resources, reusable software Resources, Environmental Resources Software Project Estimation Decomposition techniques, Empirical estimation models Software Quality Assurance: Software Quality Assurance: Quality Concepts, Quality Movements, SAQ activities, Statistical Quality Assurance, Software reliability, SAQ Plan, ISO9000 Quality standard

UNIT-I

Analysis Concepts & Principles: Requirements analysis, Analysis Principles-Information domain, Modeling, Partitioning , Analysis Modeling- Elements of the Analysis model, Data modeling-Data objects, attributes, Relationships, Cardinality, Modality, Entity-relationship diagrams, Functional modeling & information flow -Data flow diagrams, Ward & Millor Extensions, Mechanics of structured Analysis -Creating Data flow diagrams, Control flow diagram

UNIT-IV

Design Concepts & Principles: Design process, design Principles, design concepts-Abstraction, Refinements, Modularity, Software architecture, control hierarchy, Structural partitioning, Information hiding, Effective modular design-Functional independence, Cohesion, coupling, Design specification Outline

UNIT - V

Software Testing: Testing Objectives and principles, Testability, White box Testing, Black Box Testing, Control structure testing, testing for specialized environments.

Software testing Strategies - Verification and Validation, Testing strategies, Unit testing, Integration testing, Validation testing, System testing, Debugging process. Software Maintenance - Various types.

TEXT & REFERENCE BOOK:

- *Software Engineering- A Practitioner's Approach, Fourth Edition, By Roger S. Pressman, McGraw Hill.*



**5BCA4(B) –FUNDAMENTALS OF MATHEMATICS - IV
(COUNTING PRINCIPLES, PROBABILITY AND STATISTICS)**

UNIT-I

Elementary counting principle - Product rule, Binomial and multinomial theorem, Stirling's formula, Principle of inclusion and exclusion, Permutations and combinations, Derrangements Marriage problem.

UNIT-II

Recurrences and generating functions, Solution of recurrences using generating functions

UNIT-III

Discrete probability, Applications of counting principles to calculate discrete probability.

UNIT-IV

Definition of a random variable. Probability distribution and density function. Mathematical Expectation. mean, median, mode. Skewness and Kurtosis. Higher moments. Various probability distributions Normal, Binomial, Poisson, and Cauchy distributions, and their properties.

UNIT-V

Correlation and statistical independence. Conditional probability. Numerical generation of random variables with a given distribution

Statement of the central limit theorem, and numerical test of the central limit theorem.

UNIT-VII

Basics of Sampling Theory Sample mean and variance. Sampling biases, with special reference, Internet sampling. Stratified sampling.

UNIT-VII

Introduction to Monte Carlo methods

TEXTS & REFERENCE BOOKS :-

- Joe.L.Mott, Abraham Kandel, T.P.Baker, "Discrete Mathematics For Computer Science And Mathematicians "
- S.S.Sastry, "Engineering Mathematics", Prentice Hall of India



5BCA5 (A) AND 5BCA5 (D)

ASP.NET AND C#

UNIT – I

Overview of ASP.NET framework, Understanding ASP.NET Controls, Applications

Web servers, installation of IIS.

Web forms, web form controls -server controls, client controls, web forms & HTML, Adding controls to a web form ,Buttons, Text Box , Labels, Checkbox, Radio Buttons, List Box, etc.

Running a web Application, creating a multiform web project.

UNIT-II

Form Validation: Client side validation, server Side validation, Validation Controls : Required Field Comparison Range. Calendar control, Ad rotator Control, Internet Explorer Control.

State management- View state, Session state, Application state,

UNIT-III

Architecture of ADO.NET, Connected and Disconnected Database, Create Connection using ADO.NET Object Model, Connection Class,

Command Class, DataAdapter Class, Dataset Class. Display data on data bound Controls and Data Grid.

Database Accessing on web applications: Data Binding concept with web, creating data grid, Binding standard web server controls. Display data on web form using Data bound controls.

UNIT-IV

Writing datasets to XML, Reading datasets with XML.
Web services: Introduction, Remote method call using XML, SOAP, web service description language, building & consuming a web service, Web Application deployment.

UNIT-V

Overview of C#, C# and .NET, similarities & differences from JAVA, Structure of C# program.
Language features: Type system, boxing and unboxing, flow controls, classes, interfaces, Serialization, Delegates, Reflection.

TEXT BOOKS & REFERENCE BOOKS

VB.NET Black Book by steven holzner –dreamtech

ASP.NET Unleashed

C# programming – wrox publication

C# programming Black Book by Matt telles



5BCA9–PROFESSIONAL PERSONALITY SKILLS

UNIT-I

MANAGEMENT & TECHNOLOGY

Fusion of Management and Technology
Importance of DataBase Management in Marketing and Sales Environment

UNIT-II

CONDENCED COMPREHENSIVE COMMUNICATION

UNIT-III

AWARENESS OF CURRENT AFFAIRS (PART II)

Reading of English Newspaper

UNIT-IV

INTERVIEW TECHNIQUES

Personal Interview Technique
Group Discussion Technique
Case Discussion Technique
Mock Sessions

GUIDELINES FOR INTERNAL AND CONTINUOUS ASSESSMENT

1. Marking scheme for Major Project, Minor project, and summer assignment has already been specified in the next section.
2. Out of 100 internal marks 30 marks are reserved for practical work. These marks will be based on a record of lab-exercises work in a journal (Practical Exercise Book) maintained by the student.
3. Each practical paper of the semester should involve **at least 15 practical excerises**, (Decided by the concerned subject teacher of the study institute) which cover the entire syllabus.
4. Out of 100 internal marks 50 marks are reserved for 5 theory papers (10 marks per paper). These marks are to be awarded on the basis of at least two written tests conducted during the semester.
5. 10 marks are reserved for attendance and must be based on attendance register maintained by the teacher.
6. 10 marks are left to the discretion of the concerned teacher.
7. Practical Exercise Books, question papers and answer sheets of internal tests, and attendance records of all the students should be maintained for **at least two years** and may be inspected by the University at any time during this period.