

B.C.A. THIRD YEAR

With effect from 2013-14

CODE No.	SUBJECT TITLE	TEACHING PERIODS / WEEK		MAXIMUM MARKS		TOTAL MARKS (A+B)	DURATION OF EXAM
		Theory	Practical	Theory / Practical (A)	Internal Test Marks (B)		
SEMESTER 5:							
BCA.S5.1	CORE JAVA	4		80	20	100	3
BCA.S5.2	PRINCIPLES OF COMPILER DESIGNING	4		80	20	100	3
BCA.S5.3	DISTRIBUTED SYSTEMS	4		80	20	100	3
BCA.S5.4	LINUX & UNIX OPERATING SYSTEMS	4		80	20	100	3
BCA.S5.5	PROJECT WORK	4		80	20	100	3
BCA.S5.PR1	Comp.lab.1 (Java)		3	50		50	3
BCA.S5.PR2	Comp.lab.2 (Linux)		3	50		50	3
TOTAL MARKS						600	
SEMESTER 6:							
BCA.S6.1	ADVANCE JAVA	4		80	20	100	3
BCA.S6.2	MULTIMEDIA SYSTEM	4		80	20	100	3
BCA.S6.3	COMPUTER GRAPHICS	4		80	20	100	3
BCA.S6.4	MOBILE COMMUNICATION	4		80	20	100	3
BCA.S6.5	VISUAL BASIC.NET	4		80	20	100	3
BCA.S6.PR1	Comp.lab.3 (Advance Java)		3	50		50	3
BCA.S6.PR2	Comp.lab.4 (VB.NET)		3	50		50	3
TOTAL MARKS						600	

Total 3rd year Marks (5th sem+6th Sem)=1200

Total Marks(1st +2nd +3rd)year =3600

BCA.S5.1- CORE JAVA

TOTAL MARKS 80

TOTAL LECTURES 50

Topic No.	Topics	No. of Lect.
1.	Introduction to Java <ul style="list-style-type: none">• Java history• Java features• How Java differ from C and C++• Java program structure• Java Virtual Machine• Constants, Variables & Data types	7
2.	Branching and Looping Statements <ul style="list-style-type: none">• Simple If statement• If... Else statement• Nested if ... else statement• Switch statement , While statement, Do statement, For statement	7
3.	Arrays, Strings, Vectors <ul style="list-style-type: none">• Arrays, Creating Arrays• One Dimensional Array, Two Dimensional Array• Strings• Vectors• Wrapper Classes	8
4.	Classes, Objects and Methods <ul style="list-style-type: none">• Defining a class• Method declaration• Creating Objects• Accessing Class Members• Constructors• Methods Overloading• Static Members• Final variable, Final Class• Finalize Methods	9

5.	Multithreaded Programming <ul style="list-style-type: none"> • Introduction • Creating Threads, Extending the Thread Class • Stopping & Blocking a Thread • Life Cycle of thread • Thread Priorities • Synchronization 	6
6.	Interfaces & packages <ul style="list-style-type: none"> • Introduction • Defining interfaces, Extending interfaces • Implementing interfaces • Java API packages • Accessing & using a package • Adding a class to a package 	6
7.	APPLET Programming <ul style="list-style-type: none"> • Introduction • Preparing to Write Applets, Building Applet code • Applet Life Cycle • Applet Tag • Running Applet 	7

Suggested Readings:

1. “Programming with JAVA a Primer” by E. Balguruswamy TATA McGraw Hill
2. “The Complete Reference JAVA 2” by H. Schildt

BCA.S5.2 – PRINCIPLES OF COMPILER DESIGNING

TOTAL MARKS 80

TOTAL LECTURES 50

Topic No.	Topic	No. of Lect.
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1.	<p>Introduction to Compilers</p> <ul style="list-style-type: none"> • Compilers & Translators • Need of translators • The structure of compiler • Lexical analysis • Syntax analysis • Intermediate code generation • Optimization • Code generation 	10
2.	<p>Programming languages</p> <ul style="list-style-type: none"> • High - Level programming languages • Definitions of programming languages • The Lexical & syntactic structure of a language • Data elements • Data structures • Operators • Assignment • Statements 	10
3.	<p>Finite Automata & Lexical analysis</p> <ul style="list-style-type: none"> • The role of the lexical analyzer • A simple approach to the design of lexical analyzer • Regular expressions • Finite Automata • From regular expressions to finite automata • Minimizing the number of states of a DFA • A language for specifying lexical analyzer 	8

4.	The syntactic specification of programming languages <ul style="list-style-type: none"> • Context free grammars • Derivations & parse trees • Capabilities of context-free grammars 	7
5.	Basic parsing techniques <ul style="list-style-type: none"> • Parsers • Shift-reduce parsing • Operator - precedence parsing • Top-Down parsing • Predictive parsers 	5
6.	Automatic construction of efficient parsers <ul style="list-style-type: none"> • LR parsers • The canonical collection of LR (0) items • Constructing SLR parsing tables • Constructing canonical LR parsing tables • Constructing LALR parsing tables • Using ambiguous grammars • An automatic parser generator • Implementation of LR parsing tables • Constructing LALR sets of items. 	10

Suggested Readings:

1. Principles of Compiler Design - by Alfred V. Aho, Jeffrey D. Ullman. Narosa Publishing House ISBN-81-85015-61-9
2. Compilers, Principles, Techniques, and tools- by Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman ISBN-817-808-046-x

BCA.S5.3 – DISTRIBUTED SYSTEMS

TOTAL MARKS: 80

TOTAL LECTURES :50

Topic No.	Topic	No. of Lect.
1.	Introduction <ul style="list-style-type: none">• Definition of distributed system• Goals• Types of Distributed systems	6
2.	Architectures <ul style="list-style-type: none">• Architectural styles• System Architectures: Centralized Architectures, Decentralized Architectures, Hybrid Architectures• Architectures Versus Middleware• Self-Management in Distributed systems	10
3.	Processes <ul style="list-style-type: none">• Threads• Virtualization• Clients• Servers• Code Migration	8
4.	Communication <ul style="list-style-type: none">• Fundamentals• Remote Procedure Call• Message oriented communication• Stream oriented communication• Multicast communication	8
5.	Naming <ul style="list-style-type: none">• Names, Identifiers, and Addresses• Flat Naming• Structured Naming• Attribute-Based Naming	8

6.	<p>Synchronization</p> <ul style="list-style-type: none"> • Clock synchronization: Physical clocks, Global Positioning system, Clock synchronization Algorithms • Logical Clocks • Mutual Exclusion: Centralized Algorithm, A Decentralized Algorithm, A Distributed Algorithm, A Token Ring Algorithm. • Global Positioning of Nodes • Election Algorithms 	10
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Suggested Readings:

1. Distributed systems principles and Pargadigms, Second Edition- by Andrew S.Tanenbaum, Maarten Van Steen.

BCA.S5.4 – LINUX & UNIX OPERATING SYSTEMS

TOTAL MARKS 80

TOTAL LECTURES 50

Topic No.	Topic	No. of Lect.
1.	Introduction <ul style="list-style-type: none">• History of Unix• Directory structure of Unix & Linux• History of Linux• Comparison of various operating systems• Advantages of Linux, Flavors of Linux, Installation notes, Linux Loader, Linux kernel	8
2.	File System and Devices <ul style="list-style-type: none">• File System concept ext3, ext2.• File systems: - mount, fsconf and other related commands• Adduser, alias, cat, cd, chmod, chown, chroot, cp, cpio, dc, df, dir, du, fdformat, find, finger, grep, gunzip, gv, gvim, gzip, halt, hostname, ifconfig, kill, logout, lpc, lpd, lp, rm, ls, man, mcopy, mformat, mkdir, more, mount, mt, mv, passwd, ping, ps, pwd, quota, quotaoﬀ, rm, rmdir, route, set, shut down, sort, stat, strings, su, tar, tree, umount, unzip, vdir, vi, view, wc, who, whoami, zip.	9
3.	Working with permissions <ul style="list-style-type: none">• Assigning file permission• Directory Permission• Using text editors• Working with vi & emacs• System services and run levels• Controlling services at boot with administration tools (chkconfig & using GUI based services)	8

4.	System Administration <ul style="list-style-type: none"> • Performing system maintenance • Communication commands :- write, wall, talk, mesg, motd, • Pre-login Message • Managing software with RPM :- Installing, Uninstalling, Upgrading • Managing users and managing Groups and managing passwords. 	8
5.	Backup strategies <ul style="list-style-type: none"> • Choosing Backup Strategies and Operations • Choosing Backup hardware and media. • Using backup software and commands 	8
6.	Network configuration for Linux <ul style="list-style-type: none"> • Network configuration tools • Dynamic host configuration protocol. • Network files system. • Introduction to samba • Introduction to DNS & Apache web server 	9

Suggested Readings:

- 1 Bill Ball, David Pitts, “Red Hat Linux 7 Unleashed”, Techmedia SAMS Publication
- 2 Evi Nemeth, Garth Snyder, Scott Seebass, Trent R. Hein, “UNIX System Administration Handbook” Person Education Asia (LPE) (IIIrd Edition)
- 4 Red hat Linux & fedora unlashed Authors Bill Ball & Hoyt Dust.

BCA.S5.5 – PROJECT WORK

TOTAL MARKS 80+20

TOTAL LECTURES 40

Guidelines for Project Work

1. Student can opt any programming language / software, FoxPro, C, C++, VC++, Oracle, VB, Java etc package for project work.
 2. An individual or group of maximum 3 (three) students can work on single project
 3. Project should strictly developed in lab and student should get it checked from guide time to time.
 4. Student should get the Synopsis of project approved from guide well in advance
 5. The project work should covers
- Cover page
 - Certificate
 - Declaration
 - Acknowledgment
 - Index
 - Introduction of project
 - Data flow diagram
 - Source code
 - Result/output
 - Limitations
 - Conclusion
 - Bibliography

Student should submit one copy of project to the college.

For project work, there should be one external Examiner from the University & one internal Examiner from College.

BCA.S6.1- ADVANCE JAVA

TOTAL MARKS 80

TOTAL LECTURES 50

Topic No.	Topic	No. of Lect.
1.	Introduction to Java & Object Oriented Programming <ul style="list-style-type: none">• Importance of Java for Internet• Java Magic: Byte Code• Java Buzzwords• Simple program of java• Using super keyword• Dynamic method dispatch• Final class and Methods• Packages, Access Protections• Interfaces• Exception Handling Fundamentals• Working with finally clause	9
2.	Threads and Multithreading <ul style="list-style-type: none">• Multithreading Basics• Creating and Running a Thread• The Thread control Methods• Thread life cycle• Thread Priorities• Thread synchronization	5
3.	The Applet & Event Handling <ul style="list-style-type: none">• Applet Fundamentals• Applet Architectures• An Applet skeleton• The HTML APPLET tag• Passing parameters to Applet• Delegation based Event handling• Event class• Action Event• Window Event• Mouse Event• Key Event	9
4.	Introduction to AWT: Working with windows, Graphics Text <ul style="list-style-type: none">• AWT Classes• Windows Fundamentals	5

	<ul style="list-style-type: none"> • Working with Frame window • Working with Graphics • Working with Colors & Fonts 	
5.	A Tour of Swing <ul style="list-style-type: none"> • JApplet • Icons & Labels Button & Label, TextField & Buttons, • CheckBoxes, Radio buttons • Combo Box & Lists • Scroll panes • Trees • Tables • Menu Bars & Menus • Dialog Boxes • File Dialog 	10
6.	String Handling, Streams and Input/ Outputs Programming <ul style="list-style-type: none"> • String class • StringBuffer class • Java I/O Stream classes 	4
7.	JavaBeans <ul style="list-style-type: none"> • Introduction & Advantages of JavaBeans • Application Building Tools • Bean Development Kit • JAR Files • Developing Simple Bean Using the BDK • The Java Bean API 	5
8.	Servlets <ul style="list-style-type: none"> • Introduction • Life cycle of servlet • Handling HTTP Get Request • Handling HTTP Post Request 	3

Suggested Readings:

1. Java The Complete Reference- by Herbert Schildt Tata McGraw-Hill
2. Mastering Java2 J2SE1.4- by John Zukowski PBP Publication
3. Java™ How to Program sixth Edition- By H.M Deitel, P.J. Deitel
4. JAVA 2,J2SE 1.4 Complete, BPB Publication.

BCA.S6.2- MULTIMEDIA SYSTEM

TOTAL MARKS 80

TOTAL LECTURES 50

Topic No.	Topic	No. of Lect.
1.	Multimedia System <ul style="list-style-type: none">• Multimedia elements• Multimedia applications• Global structure• Evolving Technologies for Multimedia systems	5
2.	Multimedia: Media & Data Streams <ul style="list-style-type: none">• Medium• Multimedia: media & data streams• Main properties of a multimedia system• Traditional data stream characteristics• Data stream characteristics for continuous media• Information units	6
3.	Sound / Audio <ul style="list-style-type: none">• Basic sound concepts• Music: MIDI basic concepts, MIDI devices, MIDI messages, MIDI software• Speech: Speech generation, Speech Analysis, Speech Transmission	8
4.	Image And Graphics <ul style="list-style-type: none">• Digital Image Representation• Image Formats• Graphics Formats• Computer Image Processing: Image Synthesis, Image Analysis, Image Transmission• Image File Formats: BMP, JPEG, TIFF, PNG.	8

5.	Video & Animation <ul style="list-style-type: none"> • Basic concepts • Television (Conventional systems, Enhanced definition systems, High Definition system) • Computer based Animation 	8
6.	Data Compression <ul style="list-style-type: none"> • Storage space • Coding requirements • Source Entropy & Hybrid coding • Basic compression techniques (Runlength & Huffman encoding) • Introduction to following compression techniques: JPEG, H.261 (PX64), MPEG ,DVI 	9
7.	Optical Storage Media & Retrieval Technologies <ul style="list-style-type: none"> • Basic Technology • Video Disk & other WORMS • CD ROM • CD ROM Extended Architecture • Compact Disk Magneto optical 	6

Suggested Readings:

1) MULTIMEDIA SYSTEM DESIGN

By P. K. ANDLEIGH, KIRAN THAKRAR

2) MULTIMEDIA COMPUTING COMMUNICATION & APPLICATION

By RALF STEINMETZ, & KLARA NASHTEDT (Pearson Education)

BCA.S6.3 – COMPUTER GRAPHICS

TOTAL MARKS 80

TOTAL LECTURES 50

Topic No.	Topic	No. of Lect.
1	Introduction to Computer Graphics <ul style="list-style-type: none">• Introduction• Advantages of computer graphics• application of computer graphics• Display devices: Cathod Ray Tubes, Color CRT monitors• Direct View Storage Tube• Plotter• Light pen• Joystick	6
2	Raster Scan Graphics <ul style="list-style-type: none">• Line segment and line drawing algorithm• Digital differential Algorithm• Bresenham's line algorithm	6
3	Transformation <ul style="list-style-type: none">• Two dimensional transformation• Matrix representation• Translation• Rotation• Scaling• Reflection• Shear	6
4	Segmented Display Files <ul style="list-style-type: none">• Segment table• Functions for segmenting display file• Posting & unposting segments• Segment naming scheme• Default error conditions• Appending to segments	6

5	Clipping & Windowing <ul style="list-style-type: none"> • Viewing transformation • 2-D clipping • Simple visibility algorithm • End point codes • Midpoint subdivision algorithm • Polygon clipping algorithm (Sutherland-Hodgman algorithm) • Windowing transformation 	7
6	Display File Compilation. <ul style="list-style-type: none"> • Refresh concurrent with reconstruction • Free storage allocation • Display file structure 	6
7	Geometric Models. <ul style="list-style-type: none"> • Simple modeling example • Geometric modeling • Symbols & instances • Implementation of Instance transformation 	6
8	Simple Graphics Package <ul style="list-style-type: none"> • Ground rules for graphics s/w design • Function domains • Graphics primitives • Windowing function • Example-a graph plotting program • Implementation of the functions • The transformation processor • The display code generator 	7

Suggested Readings :

1. Principle of Interactive Computer Graphics -William Newman & Robert Sproull (TMH)
2. Procedural Elements for Computer Graphics -David F. Rogers (TMH)
3. Computer graphics -A.P.Gogse

BCA.S6.4 – MOBILE COMMUNICATION

TOTAL MARKS 80

TOTAL LECTURES :50

Topic No.	Topics	No. of Lect.
1	Introduction <ul style="list-style-type: none">• Application• A Short History Of wireless Communication• A Market For Mobile Communication• Some Open Research Topic• A Simplified reference Model	8
2	Introduction to Cellular Mobile Systems <ul style="list-style-type: none">• Introduction• Basic Cellular System• Performance Criteria• Operation of Cellular System, Planning a Cellular System• Analog Cellular System	8
3	Medium access control <ul style="list-style-type: none">• Motivation for specialized MAC• SDMA• FDMA• TDMA• CDMA	8
4	Telecommunication System <ul style="list-style-type: none">• GSM• DECT• TETRA	8
5	Wireless LAN <ul style="list-style-type: none">• Infra red Vs radio transmission• Infrastructure and along Network• IEEE 802.11• HIPERLAN• Bluetooth	9

6	Mobile Network Layer <ul style="list-style-type: none">• Mobile IP• Dynamic Configuration Protocol• Mobile ad-hoc Networks	9
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Suggested Readings:

1. Mobile Communications Second Edition – By Jochen Schiller (Pearson Education)
2. Mobile Cellular Telecommunications Second Edition-By William C.Y.Lee (Mc-Graw-Hill)

BCA.S6.5 –VISUAL BASIC.NET

TOTAL MARKS 80

TOTAL LECTURES 50

Topic No.	Topic	No. of Lect.
1	Welcome to Visual Basic.NET <ul style="list-style-type: none">Windows versus Dos programming, Installing Visual Basic.NET ,IDE, Creating a simple Application	5
2	The Microsoft.Net Framework: <ul style="list-style-type: none">.Net framework classes, Common Language Runtime, variables, constants, operators, Data types, working with string , Methods.	5
3	Controlling the flow: <ul style="list-style-type: none">Making decisions, If statement, Select case, Loops.	6
4	Working with data structures <ul style="list-style-type: none">Understanding Arrays, understanding Enumerations, understanding constants, structures, Working with collections and Lists, Building lookup table with Hash table, Advanced array manipulation	7
5	Building Windows Applications : <ul style="list-style-type: none">Responding to Events, Building sample Application. creating complex application, creating the toolbars	7
6	Displaying Dialog Boxes- <ul style="list-style-type: none">The message Dialog Box, The open dialog control, the save dialog control, the Font Dialog control, the color dialog control, the print dialog control.	7
7	Creating Menus <ul style="list-style-type: none">Understanding Menu Features, creating menus, context menus.	7

8	Debugging and Error Handling: <ul style="list-style-type: none">• Major Error types, Debugging, Error Handling	6
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Suggested Readings:

1. Beginning VB.Net2003 willis, cross land and blair
2. ASP .Net and VB.Net Web Programming-Math J. Croush (pearson Edition)
