

B.Sc. INFORMATION TECHNOLOGY SEMESTER - III

Sr. No.	Subject	No. of Theory Lect. Per Week	No. of Practical/Week
1	CS-13 Operating System	4 + 1	-
2	CS-14 Object oriented programming with C++	4 + 1	6
3	CS-15 Web development using Scripting Languages	4 + 1	6
4	CS-16 Programming with Visual Basic	4 + 1	6
5	CS-17 Practical on CS-14		
6	CS-18 Practical on CS-15 & CS-16		

CS-13 Operating System				
No.	Topics	Details	Mark	Lect
1	Introduction	Definitions, functions and types of operating system, System components, Operating system Services, System Calls, System programs, System structure.	10	9
2	Processes	Process Concepts, process state & process control block, Process Scheduling, Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling Real-Time Scheduling, Threads, Critical Section Problem , Semaphores, Classical Problem Of Synchronization.	25	15
3	Deadlock	Deadlock Characterizations, Method for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Process Scheduling in Linux.	15	8
4	Memory Management	Logical versus physical address space, Swapping, Contiguous Allocating, Paging, Segmentation, Virtual Memory, Demand Paging, Performance of Demand Paging, Page Replacement, Page Replacement Algorithms, Memory Management in Linux.	20	12
5	File System	File Attributes, File operations, File types, File & Directory Structure, File System Implementation, Protection, File system in Linux	10	6
6	Input/Output	Principles of IO Hardware (I/O Devices, Direct Memory Access) Principle of I/O Software (Device Drivers) Disks: Disk Scheduling, Disk Management, Swap Space Management, Disk reliability, Stable Storage Implementation.	20	10
TOTAL			100	60

Reference Books :-

1. Operating System Concepts by Silberschatz & Galvin, Addison Wesley Publication 6th Edition.
2. Operating System Concepts & Design by Milan Milen Kovic, TMH Publication
3. H.M. Deitel, An Introduction to Operating System, Second Edition, Addison Wesley, 1990.
4. Modern Operating Systems By Andrew S. Tanenbaum

CS –14 Object oriented programming with C++				
No.	Topics	Details	Marks	Lect.
1	Principles of object oriented programming	Procedure – oriented programming Object oriented programming paradigm Basic concepts of object oriented programming Benefits of object oriented programming Application of object oriented programming What is C++, Application of C++, input/output operators, structure of C++ program	5	4
2	Tokens, Expressions & Control Statements	Tokens: keywords, identifiers, basic data types, user-defined types, derived data types, symbolic constants, type compatibility, declaration of variables, dynamic initialization of variables, reference variables. Operators in C++: scope resolution operator, member referencing operator, memory management operator, manipulators, type cast operator. Expression & its types, special assignments, implicit conversions, operator precedence. Control structure, Condition control structure (if, if...else, nested if else, switch etc.) Looping control structure (for, while, do... while)	10	7
3	Functions in C++	The main function, Function prototype, Call by reference, Return by reference, Inline function, Default arguments, Const arguments, Functions overloading	10	6
4	Classes and Objects	C structures revisited, Specifying a class, Defining member functions, nesting of member functions, private member function, Making outside function inline, Arrays within a class, Memory allocation for objects, Static data member, Static member functions, Arrays of objects, Objects as function arguments, Friendly functions, Returning objects, Const member function, Pointer to members	15	7
5	Constructor and Destructor	Characteristics of constructor, Parameterized constructor, multiple constructor in a class, constructor with default argument, Copy constructor, Dynamic initialization of objects, Constructing two dimensional array, Dynamic constructor, Destructors.	10	5
6	Operator Overloading & type Conversions	Concept of operator overloading, Over loading unary and binary operators, Overloading of operators using friend function, Manipulation of string using operators, Rules for operator overloading, Type conversions.	10	6
7	Inheritance	Defining derived classes, Types of inheritance (Single, Multiple, Multi-level, Hierarchical, Hybrid), Virtual base class, Abstract class, Constructors in derived class, Nesting of classes.	10	5
8	Pointer, Virtual functions and Polymorphism	Pointer to Object, Pointer to derived class, This pointer, Rules for virtual function, Virtual function and pure virtual function.	10	5

9	Console I/O operations	C++ streams, C++ stream classes, Unformatted and formatted I/O operations, Use of manipulators, Custom manipulator	5	5
10	Working with Files	File stream classes, Opening and closing a file, Error handling, File modes, File pointers, Sequential I/O operations, Updating a file (Random access), Command line arguments	10	7
11	Exception handling	Introduction, try, catch, multiple catch blocks, generic catch block, Rethrowing an exception, Specifying an exception	5	3
Total			100	60

Reference Books:

1. Object Oriented Programmin in C++ - E.Balagurusamy, BPB
2. Mastering C++ - Venugopal
3. Object Oriented Programmin in C++ - Robaret Laphore
4. Let us C++ - Yashvant Kanitkar, BPB

CS –15 Web development using Scripting Languages				
Sr No	Topics	Details	Marks	Lect
1	HTML & DHTML	The Structure of a Page. Links and Navigation. Colors, Images, and Objects. Tables. Forms. Frames. Deprecated and Browser-Specific Markup JavaScript Objects and Dynamic HTML Some examples of Dynamic HTML	30	15
2	CSS	CSS Basics. Style Definitions. Text. Padding, Margins, and Borders. Colors and Backgrounds. Tables. Element Positioning. More on Cascading Style Sheets. Page Layout.	10	10
3	JAVA SCRIPT	Introduction to JavaScript. Data Types and Variables. Decisions, Loops, and Functions. JavaScript – An Object-Based Language. Programming the Browser. HTML Forms: Interacting with the User. Windows and Frames. String Manipulation. Date, Time, and Timers. Common Mistakes, Debugging, and Error Handling. Storing Information: Cookies.	40	20

4	XML	Introduction to XML - What Is XML? - XML Namespaces. Validation. - Document Type Definitions. - XML Schemas. - RELAX NG. Processing. - XPath. - XSLT. Introduction Databases & Programming. - XQuery, the XML Query Language. - XML and Databases. - The XML Document Object Model (DOM). - Simple API for XML (SAX).	20	15
---	-----	---	----	----

Reference Books.

1. Beginning Web Programming with HTML, XHTML, and CSS by Jon Duckett Wrox Publication.
2. Beginning JavaScript by Paul Wilton Wrox Publication.
3. Practical HTML 4.0 by Lee Philips
4. World wide web design with HTML by Cxavier
5. Mastering Front Page – 2000 by BPB

CS –16 Programming with Visual Basic				
No.	Topics	Details	Mark	Lect.
1	Introduction	GUI and Windows, Office Automation. VB as Event Driven Programming Property, Event & Method	5	2
1	Visual Environment	Feature of Visual Environment, Forms ,Toolbox, property box , general/ frequently used tools. Designing of forms ,controls menu design, creating dialog box and types [Controls: Text box, label, Command butt, Option butt, Check box, Frame, Horizontal – Vertical scroll bar, Combo box, List box, Timer, shape, Line, Drive list box, directory list box, file list box, picture box, image box -Advance controls: Common dialog control, Rich text box, MSFlex gird -Use of MsgBox() & Inputbox()]	30	15
2	Variables Concept, Looping & Array	Data types Declaration of variables Scope & life Time of Variables (Local, Form, Module, Global) Arithmetic & Relation operator Decision making using if & select case Loop using for, while, wend, do, do until Defining array 1D, 2D, 3D Static & Dynamic Array Control Array	15	12
3	Multiple Form, MDI	MDI form basic designing an MDI based application ,building the MDI form creating MDI child forms, Data grids.	5	4
4	Procedure, functions, menus	-Creating procedure & function -Concept of ByRef & ByVal -Concept of Public & Private Scope -Use of Menu Editor	5	5
5	Library Function	-Functions:Abs(),array(),asc(),choose(), chr(),date(),dateadd(),datediff(),datepart(), dateserial(),day(),Format(),formatcurrency(), formatdatetime(),Formatnumber(), formatpercent(), iif(), instr(), instrev(),isarray(), isdate(),isnull(),Isnumeric(), Join(), Lcase(),Left(), Len(), Loadpicutre(), Ltrim(),Rtrim(), Trim(), Mid(), Month(), Monthname(),Now(), Qbcolor(), Replace(), RGB(), Right(),Rnd(), Sqr(), Str(), Strcomp(), String(),Strreverse(), Time(), Ucase(), Val(), Weekday(), Weekdayname(), Year()	10	8

6	Visual Basic Data Tools	-Data view window, query designer, data reports -- DAO,ADO [Bounded & Unbounded Connectivity] -Introduction to Advance Data Bound Control.	20	10
7	Advance Concepts	-Introduction to ActiveX development ,DLL,API and ODBC.	10	4
Total			100	60

Reference Books:

1. Programming in Visual Basic - McBridbe
2. Visual Basic. 6 Programming- Bible
3. Visual Basic Programming- Black book
4. Mastering Visual Basic.
5. Teach yourself Visual Basic -Perry

CS – 17 Practical & Viva Based on CS – 14		
No.	Topics	Marks
1	CS – 14 (C++ – Programming)	50
		50

Each session is of 3 hours for the purpose of practical examination

CS – 18 Practical & Viva Based on CS – 15 & 16		
No.	Topics	Marks
1	CS – 15 (Web development) CS – 16 (Visual Basic 6.0)	50
		50

Each session is of 3 hours for the purpose of practical examination

B.Sc. INFORMATION TECHNOLOGY SEMESTER - IV

Sr. No.	Subject	No.of Theory Lect. Per Week	No. of Practical per Week
1	CS – 19 Building Application Using PHP/MYSQL	4 + 1	6
2	CS – 20 RDBMS Using ORACLE	4 + 1	6
3	CS – 21 Introduction to Java	4 +1	6
4	CS – 22 Computer Network Technology	4 + 1	-
5	CS – 23 Practical on CS - 19		
6	CS – 24 Practical on CS-20 & CS-21		

CS – 19 Building Application Using PHP/MYSQL				
No.	Topic	Details	Marks	Lect.
1	Introduction	Internet and WWW, IP Addressing and Domain Name System Web Browser and Web Server, Web Hosting, Virtual Host, Multi Homing Client & Server side Scripting	10	5
2	PHP	Introduction to PHP PHP configuration in IIS & Apache Web server Web Protocol : HTTP PHP Variable Static & global variable GET & POST method PHP Operator Conditional Structure & Looping Structure Array User Define Function : - argument function - default arument variable function return function Variable Length Argument Function - func_num_args - func_get_arg - func_get_args Variable Function Gettype, settype, isset, unset, strval, floatval, intval, print_r String Function Chr, ord, strtolower, strtoupper, strlen, ltrim, rtrim, trim, substr, strcmp, strcasecmp, stripslashes, strpos, strstr, stristr, str_replace, strrev, echo, print Math Function Abs, ceil, floor, round, fmod, min, max, pow, sqrt, rand Date Function Date, getdate, setdate, Checkdate, time, mktime Array Function Count, list, in_array, current, next, previous, end, each, sort, rsort, asort, arsort, array_merge, array_reverse File handling Function Fopen, fread, fwrite, fclose, file_exists, is_readable, Miscellaneous Function Define, constant, include, Require, header, die, mail PHP File Upload	65	40

		FTP Function ftp_alloc, ftp_cdup, ftp_chdir, ftp_chmod, ftp_close, ftp_connect, ftp_delete, ftp_fget, ftp_fput, ftp_get, ftp_put, ftp_login, ftp_mkdir, ftp_pwd, ftp_rename, ftp_rmdir, ftp_size Cookies Session \$_Server variable GD library usages in PHP PDF creation		
3	MySQL	Introduction to MySQL Installing MySQL MySQL User Administration PHPMyadmin Backup Replication MySQL Data types MySQL Functions Connecting to MySQL Mysql_connect, mysql_select_db Making MySQL Queries Mysql_query (create, insert, update, delete, select) Fetching Data Sets Mysql_fetch_row, Mysql_fetch_object, Mysql_fetch_array, Mysql_result	25	15
Total			100	60

Reference Books :

1. Beginning PHP5 by Wankyu Choi, Allan Kent, Chris Lea, Ganesh Prasad, Chris Ullman - WROX
2. PHP Bible, **2nd Edition** by Tim Converse, Joyce Park – Wiley Publication
3. Beginning PHP, Apache, MySQL Web Development by Michael K. Glass, Yann Le Scouarnec, Elizabeth Naramore, Gary Mailer, Jeremy Stolz, Jason Gerner - WROX
4. Beginning MySQL by Robert Sheldon, Geoff Moes - WROX

CS –20 RDBMS Using Oracle				
No.	Topics	Details	Mark	Lect
1	SQL, SQL*Plus	Introduction to SQL SQL Commands and Data types Introduction to SQL*Plus SQL*Plus formatting commands Operator and Expression SQL v/s SQL*Plus	5	3
2	Managing Tables and Data	Creating and Altering tables (Including constraints) Data Manipulation Command like Insert, update, delete SELECT statement with WHERE, GROUP BY and HAVING, ORDER BY, DISTINCT, Special operator like IN, ANY, ALL, BETWEEN, EXISTS, LIKE Join, subquery, Built in functions	15	10
3	Other ORACLE db objects	View, Sequence Synonyms, Database Links Index	8	5
4	Data Control and Transaction Control Command	Grant, Revoke, Role, Creating Users What is transaction? Starting and Ending of Transaction Commit, Rollback, Savepoint	5	4
5	Introduction to PL/SQL	SQL v/s PL/SQL PL/SQL Block Structure Language construct of PL/SQL (Variables, Basic & Composite Data type, Conditions looping etc.) %TYPE and %ROWTYPE Using Cursor (Implicit, Explicit)	12	8
6	Advanced PL/SQL	Creating and Using Procedure, Functions, Package, Triggers. Creating Objects, PL/SQL Tables, Nestead Tables, Varrays etc...	20	12
7	Oracle Database Structure	Instance Architecture (Database Processes, Memory Structure, Data files) Creating & Altering Database Opening & Shutdown Database Initialization Parameter Control Files, Redo Logs files Tablespace(Create, Alter, Drop) Rollback Segment (Create, Alter, System, Transaction RBS) Oracle Blocks Import, Export and SQL*Loader	25	14
8	Backup & Recovery	Backup & Recovery Type of Backup (Control file, Redo log file, Cold, Hot) What is Net 8? Why use Net 8? Listener, Dispatcher	10	4
Total			100	60

Reference Book:

1. SQL, PL/SQL the programming lang. of oracle - Ivan Bayross - BPB Publications.
2. Using Oracle 8i - Page, Hughes.- QUE&PHI Publication.
- 3 Oracle 8i The Complete Reference - George Koch, Kevin Loney - Oracle Press and Tata MacGraw- Hill.

CS –21 Introduction to JAVA				
No.	Topic	Details	Marks	Lect.
1	Basics	Java Features, JDK and its components (Various tools of JDK), Bytecode and JVM Language building blocks: (Tokens, identifiers, keywords, literals, white spaces, comments) Primitive data types and their initial values, arrays, operators – precedence and associativity, type conversion and casting, garbage collection, Flow controls Loop statements – While, do, for, break, continue Condition statements – if – else, switch	10	8
2	Concepts of Class	Defining classes, creating objects, constructors, static members, all types of inheritance, interfaces, overloading and overriding of methods, final variable and methods, abstract methods and class, finalize methods, visibility controls and modifiers : Access Modifiers – Public, private, default, protected Other modifiers : final, abstract, static, synchronized, native, volatile, transient	10	10
3	Packages	Java API packages (java, applet, java, awt, java.io, java.lang, java.net, java.util etc.) Which package is used for what purpose naming conventions, creating, accessing and using packages, adding class to package java.lang package classes (Object, Math, String, StringBuffer, wrapper classes) java.util package classes (Date, Random, Calendar, GregorianCalendar, Vector, enumeration interface, Stack, Hashtable, Stream Tokenizer)	10	7
4	Multithreading and Exception handling	What is a thread, Java Thread Model, Implementing threads in two ways – Thread class and Runnable interface, various thread methods, thread states – (running, ready, dead, waiting states – waiting, sleeping, suspended, blocked), thread priorities, Synchronization and monitors – how to implement, deadlock, Exception Handling, Types of exception, exception handling using catch, finally, throws etc.	15	10
5	Networking	Concept of socket classes (InetAddress, ServerSocket, Socket, DatagramPacket, DatagramSocket, URL)	5	3

6	Event Handling	Event Delegation Model or Event Class Hierarchy, All classes and interfaces of Event Delegation Model, Programmes related to event handling covering all types of events	10	5
7	Applets	What is an Applet, Applet Lifecycle, Applet class, AppletContext class, passing parameters to applet, Use of Java. awt. Graphics class and its various methods in an applet	10	3
8	Input / Output	<p>Concept of streams, Difference between CharacterStreams and ByteStreams</p> <p>CharacterStreams (Reader, Writer, BufferedReader, InputStreamReader, FileReader, BufferedWriter, OutputStreamReader, FileWriter, PrintWriter)</p> <p>ByteStreams (InputStream, FileInputStream, FilterInputStream, BufferedInputStream, DataInputStream, OutputStream, FileOutputStream, FilterOutputStream, BufferedOutputStream, DataOutputStream, PrintStream)</p> <p>Other Classes (RandomAccessFile, StreamTokenizer, File)</p>	10	5
9	Swing	<p>Layout managers (FlowLayout, BorderLayout, CardLayout, GridBagLayout, GridLayout)</p> <p>What is swing, Swing Vs AWT, Container class, Swing Components (JApplet, JLabel, JButton, JCheckBox, JCheckboxgroup, JChoice, JtextField, JTextArea, JList, JScrollbar, JPanel, JFrame, JMenu, JMenuBar, JMenuItem, JPasswordField, JRadioButton)</p>	20	9
Total			100	60

Reference Books :

1. The Complete Reference Java 2
2. JAVA2 Black Book
3. A Programmer Guide to JAVA Certification by Khalid A. Mughal

CS – 22 Computer Network Technology				
No.	Topics	Details	Mark	Lect.
1	Network Layer	Design Issues, Packet switching, Connectionless and Connection-oriented Services, Virtual Circuit and Datagram Subnets, Routing Algorithms, Internetworking, Firewalls, Congestion prevention policies, Load shading, Jitter Control, Quality of Service	15	9
2	Network layer Protocols	ARP, IP protocol, IP Addresses, IPV6, ICMP, Unicast	5	3
3	Transport Layer	Services and service primitives, Sockets and Socket programming, Elements of Transport protocol: Addressing, Connection establishment and release, flow control and buffering. Multiplexing, Crash recovery, Simple Transport Protocol, UDP: Introduction, RFC, TCP: Introduction, Model, protocol, header, connection establishment and release, connection management, Transmission policy, congestion control, timer management, Introduction to wireless TCP and UDP, Performance issues.	20	12
4	Application Layer	Domain Name System (DNS) and DNS servers, Electronic Mail: Architecture and services, Message Formats, MIME, message transfer, SMTP, Mail Gateways, Relays, Configuring Mail Servers, File Transfer Protocol, General Model, commands, TFTP Static and dynamic web pages, WWW pages and Browsing, HTTP, LDAP, Browser .Architecture, Caching in Web Browser remote login, Wireless Web	20	12
5	Multimedia Networking	Multimedia networking applications, streaming stored audio and video, making the best of the Best-Effort services, Protocols for Real time interactive application RTP, RTCP, RTSP, SIP, M.323/H.324, Scheduling and policing mechanisms, integrated services, RSVP	15	10
6	Network Configuration, Management and Modeling	What is network management and its infrastructure, Internet-standard management framework, Bootstrap protocol, DHCP, BOOTP. Analysis of loss and delay, queuing theory, ni/in/l queue	15	10
7	Wireless and Broadband Networks	Basic overview of various technologies like Wireless links- 802.11, Bluetooth, ATM, Frame relay, B-ISDN, SMDS, X-25	10	4
		Total	100	60

Reference Books:

1. James Kurose.Keith W. Ross," Computer Networking : A top down approach featuring the Internet, Pearson Education,2nd Edition, 2004, ISBN 81-1808-787-1
- 2..Tanenbaum Andrew S., "Computer Networks", PHI, 4* Edition, 2003, ISBN 81-203-2175-8
3. Behrouz A. Forouzan, "TCP-IP Protocol Suite", Tata McGraw Hill Edition Edition, 2003, ISBN 0-07-049551-3
4. Kershanbaum; "Telecommunication Networks"

CS – 23 Practical & Viva Based on CS – 19		
Sessions	Topics	Marks
1	CS – 19 PHP/MySQL	50
		50

Each session is of 3 hours for the purpose of practical examination.

CS – 24 Practical & Viva Based on CS – 20 & 21		
Sessions	Topics	Marks
1	CS – 20 RDBMS Using ORACLE CS – 21 Java	50
		50

Each session is of 3 hours for the purpose of practical examination