B. C. A. (Semester V)

501 : Java Programming

Objectives:-

1. **To learn the basic concept of Java Programming.**
2. **To understand how to use programming in day to day applications.**

Unit No.	Topic	No. of Lectures	Reference Books
1	**Introduction to Java** 1.1 Features of java 1.2 JDK Environment & tools like(java, javac, appletviewer, javadoc, jdb) 1.3 OOPs Concepts Class, Abstraction , Encapsulation, Inheritance, Polymorphism 1.4 Difference between C++ and JAVA 1.5 Structure of java program 1.6 Data types ,Variables ,Operators , Keywords ,Naming Convention 1.7 Decision Making (if, switch), Looping(for, while) 1.8 Type Casting 1.9 Array Creating an array Types of Array - One Dimensional arrays - Two Dimensional array 1.10 String - Arrays , Methods. - StringBuffer class	8	1,2
2	**Classes and Objects** 2.1 Creating Classes and objects 2.2 Memory allocation for objects 2.3 Constructor 2.4 Implementation of Inheritance Simple, Multilevel, 2.5 Interfaces	10	1,2

	2.6 Abstract classes and methods 2.7 Implementation of Polymorphism 2.8 Method Overloading, Method Overriding 2.9 Nested and Inner classes. 2.10 Modifiers and Access Control 2.11 Packages Packages Concept Creating user defined packages 2.12 Java Built in packages java.lang->math java.util->Random, Date, Hashtable 2.13 Wrapper classes		
3	**Collection** 3.1 Collection Framework. 3.1.1 Interfaces - Collection - List - Set - SortedSet - Enumeration - Iterator - ListIterator 3.1.2. Classes - LinkedList - ArrayList - Vector - HashSet - TreeSet - Hashtable 3.2 Working with maps 3.2.1 Map interface 3.2.2 Map classes - HashMap - TreeMap	6	1,2

4	**File and Exception Handling** **Exception** 4.1 Exception types 4.2 Using try catch and multiple catch Nested try, throw , throws and finally 4.3 Creating user defined Exceptions **File Handling** 4.4 Stream ByteStream Classes CharacterStream Classes 4.5 File IO basics 4.6 File operations Creating file Reading file(character, byte) Writing file (character, byte)	8	1,2
5	**Applet, AWT and Swing Programming** **Applet** 5.1 Introduction 5.2 Types applet 5.3 Applet Life cycle - Creating applet - Applet tag 5.4 Applet Classes - Color - Graphics - Font **AWT** 5.5 Components and container used in AWT 5.6 Layout managers 5.7 Listeners and Adapter classes 5.8 Event Delegation model **Swing** 5.9 Introduction to Swing Component and Container Classes	12	1,2
	Total no. of Lectures	**44**	

Reference Books:

1. Programming with JAVA - E Balgurusamy
2. The Complete Reference – JAVA Herbert Schildt

B.C.A. (Semester V)

502 : Web Technologies

Objectives -:

1. **To know & understand concepts of internet programming.**
2. **To understand how to develop web based applications using PHP.**

Unit No.	Topic	No. of Lectures	Reference Books
1	**Web Essentials** 1.1 Clients- Servers and Communication 1.2 Internet-Basic ,Internet Protocols(HTTP,FTP,IP) 1.3 World Wide Web(WWW) 1.4 HTTP request message, HTTP response message	3	1
2	**Markup Languages** 2.1 Introduction to HTML 2.2 Basic HTML Structure 2.3 Common HTML Tags 2.4 Physical and Logical HTML 2.5 Types of Images, client side and server-side Image mapping 2.6 List, Table, Frames 2.7 Embedding Audio, Video 2.8 HTML form and form elements 2.9 Introduction to HTML Front Page 2.10 CSS with HTML	8	1
3	**JAVA Script** 3.1 Introduction to Java Script 3.2 Identifier & operator, control structure, functions 3.3 Document object model(DOM), 3.4 DOM Objects(window, navigator, history, location) 3.5 Predefined functions, math & string functions 3.6 Array in Java scripts 3.7 Event handling in Java script	6	2

4	**Introduction to PHP** 4.1 Introduction to PHP 4.2 What does PHP do? 4.3 Lexical structure 4.4 Language basics 4.4.1 Variable, constant, keywords, Data Types 4.4.2 Control Structures 4.4.3 Variables variable 4.4.4 Type casting, Type Juggling 4.4.5 $_GET, $_POST,$_REQUEST Variables	10	3, 4
5	**Function and String in PHP** 5.1 Defining and calling a function 5.2 Default parameters 5.3 Variable parameters, Missing parameters 5.4 Variable function, Anonymous function 5.5 Types of strings in PHP 5.6 Printing functions 5.7 Encoding and escaping 5.8 Comparing strings 5.9 Manipulating and searching strings	10	3, 4
6	**Arrays in PHP** 6.1 Indexed Vs Associative arrays 6.2 Identifying elements of an array 6.3 Storing data in arrays 6.4 Multidimensional arrays 6.5 Extracting multiple values 6.6 Converting between arrays and variables 6.7 Traversing arrays 6.8 Sorting 6.9 Action on entire arrays	7	3, 4
	Total no. of Lecturers	**44**	

Reference Books :

1. Complete HTML- Thomas Powell
2. HTML and JavaScript – Ivan Bayross
3. Programming PHP - Rasmus Lerdorf and Kevin Tatroe, O'Reilly publication
4. Beginning PHP 5 - Wrox publication

B.C.A. (Semester V)

503 : Dot Net Programming

Objectives:-

1. **This will introduce visual programming and event driven programming practically.**
2. **This will enhance applications development skill of the student.**

Unit No.	Topic	No. of Lectures	Reference Books
1	**Introduction to .Net Framework** 1.1 IDE (Integrated Development Environment) 1.2 Event Driven Programming 1.3 . NET Framework 1.4 Architecture of .Net 1.5 Execution Process of .Net Application 1.6 Features of .Net 1.7 Advantages of .Net 1.8 Develop simple .Net Application	8	1,2
2	**Introduction to VB.Net** 2.1 Basics of VB.Net 2.1.1 Operators 2.1.2 Data Types 2.2 Control Structures 2.2.1 Decision making statements 2.2.2 Loops - For, while, do while etc. 2.3 Exit Statements 2.4 Build Console Applications 2.4.1 Methods - Read(), Readline(), Write(), Writeline() etc. 2.5 Build Windows Applications 2.5.1 Controls - Form, TextBox, Button, Label, CheckBox, Listbox, ComboBox, RadioButton. DateTimePicker, MonthCalender, Timer, Progressbar, Scrollbar, PictureBox, ImageBox, ImageList, TreeView, ListView, Toolbar, StatusBar, Datagridview 2.5.2 Menus and PopUp Menu 2.5.3 Predefined Dialog controls 2.5.4 DialogBox - InputBox(), MessageBox(), MsgBox()	10	1,2,4

3	**Object Oriented Programming in VB .Net** 3.1 Class and Object 3.2 Properties, methods and events. 3.3 Constructors and Destructors 3.4 Method overloading 3.5 Inheritance 3.5.1 MyBase , MyClass keywords. 3.6 Access modifiers: Public, Private, Protected, Friend. 3.7 Method Overriding. 3.8 Interfaces. 3.9 Polymorphism. 3.10 Exception Handling	6	1,2,4
4	**Architecture Of ADO.Net** 4.1 Database : Connection, Command, DataAdapter ,DataSet, DataReader, DataTable 4.2 Connection to database with Server Explorer 4.3 Multiple Table Connection 4.4 Data binding with controls like TextBox, ListBox, DataGrid. 4.5 Navigating data source 4.6 DataGridView, DataFormwizard, Data validation	12	3
5.	**Crystal Report** 5.1 Connection to Database, Table, Queries, Building Report, Modifying Report, Formatting Fields and Object 5.2 Header, Footer, Working with formula fields, Parameter fields, Special fields 5.3 Working with Multiple Tables.	9	6,7
	Total no. Of Lectures	**44**	

Reference Books:

1. Programming Microsoft Visual Basic.NET – Frances co Balena
2. The Complete Reference -Visual Basic .NET – Jefr ey R. Shapiro
3· Murach's VB.NET database programming with ADO.NET -Anne Prince and Doug Lowe
4· The Visual Basic.NET COACH
5· Visual Basic .NET 2003 in 21 Days. – Steven Holz ner, SAMS Publications.
6· Mastering Crystal Report - BPB Publication
7· Crystal Report – The Complete Reference :- Tata McGraw Hill

B.C.A. (Semester V)

504 : Object Oriented Software Engineering

Objectives:-

1. **To Understand concept of system design using UML.**
2. **To understand system development through object oriented techniques.**

Unit No.	Topic	No. of Lectures	Reference Books
1	**Object Oriented Concepts, Modeling and UML** 1.1 What is Object Orientation? (Introduction to class, object, inheritance, polymorphism) 1.2 Model 1.2.1 Introduction of Modeling 1.2.2 Object Oriented Modeling 1.3 Object oriented system development 1.3.1 Function/data methods 1.3.2 Object oriented analysis 1.3.3 Object oriented construction 1.3.4 Object oriented testing 1.4 Identifying the elements of an object model 1.4.1 Identifying classes and objects 1.4.2 Specifying the attributes 1.4.3 Defining operations 1.4.4 Finalizing the object definition 1.5 Introduction to UML 1.6 Overview of UML 1.7 Conceptual Model of UML 1.8 Architecture 1.9 Advantages of UML	08	1, 2, 3
2	**Basic and Advanced Structural Modeling** 2.1 Classes and Relationship 2.2 Common mechanism 2.3 Diagrams 2.4 Class diagram 2.5 Advanced classes 2.6 Advanced Relationship 2.7 Interface , Types and Roles 2.8 Packages 2.9 Object Diagram	12	1

3	**Basic Behavioral and Architectural Modeling** 3.1 Use cases, Use Case Diagram 3.2 Interaction Diagram 3.3 Sequence Diagram 3.4 Activity Diagram 3.5 State Chart Diagram 3.6 Collaboration Diagram 3.7 Components Diagram 3.8 Deployment Diagram **(Minimum 2 case studies for each diagram)**	12	1
4	**Object Oriented Analysis** 4.1 Iterative Development 4.2 Understanding requirements 4.3 Unified process & UP Phases Inception Elaboration Construction Transition	8	1,3
5	**Object Oriented Design** 5.1 The Booch Method, The Coad and Yourdon Method and Jacobson and Rambaugh Method 5.2 Generic components of OO Design model 5.3 System Design process 5.3.1 Partitioning the analysis model 5.3.2 Concurrency and subsystem allocation 5.3.3 Task Management component 5.3.4 Data Management component 5.3.5 Resource Management component 5.3.6 Inter sub-system communication 5.4 Object Design process	4	3
	Total no. of Lectures	**44**	

Reference Books:

1. The Unified Modeling Language User Guide by Grady Booch, James Raumbaugh, Ivar Jacobson.
2. Object Oriented Software Engineering by Ivar Jacobson
3. Software Engineering by Pressman

B.C.A. (Semester VI)

601 : Advanced Web Technologies

Objectives :-

1. **To know & understand concepts of internet programming.**
2. **To understand the concepts of XML and AJAX.**

Unit No.	Topics	No. of Lectures	Reference Books
1	**Introduction to Object Oriented Programming in PHP** 1.1 Classes 1.2 Objects 1.3 Introspection 1.4 Serialization 1.5 Inheritance 1.6 Interfaces 1.7 Encapsulation	6	1,2
2	**Web Techniques** 2.1 Web Variables 2.2 Server information 2.3 Self Processing forms 2.4 Setting response headers 2.5 Maintaining state (Cookies and Sessions)	8	1,2
3	**Databases** 3.1 Using PHP to access a databases 3.2 Mysql Database functions 3.3 Relational databases and SQL 3.4 PEAR DB basics 3.5 Advanced database techniques 3.6 Sample application	8	1,2

4	**XML** 4.1 What is XML? 4.2 XML document Structure 4.3 PHP and XML 4.4 XML parser 4.5 The document object model 4.6 The simple XML extension 4.7 Changing a value with simple XML	8	3
5	**Web services** 5.1 Web services concepts 5.2 WSDL, UDDI 5.3 Introduction to SOAP XML-RPC 5.4 Creating web services 5.5 Calling web services	8	3
6	**Ajax** 6.1 Understanding java scripts for AJAX 6.2 AJAX web application model 6.3 AJAX –PHP framework 6.4 Performing AJAX validation 6.5 Handling XML data using PHP and AJAX 6.6 Connecting database using PHP and AJAX	6	3
	Total no. of Lectures	**44**	

Reference Books :

1. Programming PHP - Rasmus Lerdorf and Kevin Tatroe, O'Reilly publication
2. Beginning PHP 5 - Wrox publication
3. PHP web sevices - Wrox publication

B. C. A. (Semester VI)

602 : Advanced Java

Objectives -:

1. **To know the concept of Java Programming.**
2. **To understand how to use programming in day to day applications.**
3. **To develop programming logic.**

Unit No.	Topic	No. of Lectures	Reference Books
1	**JDBC** 1.1 The design of JDBC 1.2 Basic JDBC program Concept 1.3 Drivers 1.4 Architecture of JDBC 1.5 Making the Connection, Statement , ResultSet , PreparedStatement, CollableStatement 1.6 Executing SQL commands 1.7 Executing queries	10	1,2
2	**Networking** 2.1 The java.net package 2.2 Connection oriented transmission – Stream Socket Class 2.3 Creating a Socket to a remote host on a port (creating TCP client and server) 2.4 Simple Socket Program Example.	7	1,2
3	**Servlet and JSP** 3.1 Introduction 3.2 How It differ from CGI 3.3 Types of servlet 3.4 Life cycle of servlet 3.5 Execution process of Servlet Application 3.6 Session Tracking 3.7 Cookie class 3.8 Servlet- Jdbc	10	1,2

	JSP 3.9 Introduction to JSP 3.10 Components of JSP Directives , Tags, Scripting Elements 3.11 Execution process of JSP Application 3.12 Building a simple application using JSP 3.13 JSP with Database		
4	**Multithreading** 4.1 Introduction to Thread 4.2 Life cycle of thread 4.3 Thread Creation - By using Thread Class - By Using Runnable interface 4.4 Priorities and Synchronization 4.5 Inter thread communication 4.6 Implementation of Thread with Applet	8	1,2,3
5	**Java Beans and RMI** **Java Beans** 5.1 What is bean 5.2 Advantages 5.3 Using Bean Development kit(BDK) 5.4 Introduction to jar and manifest files 5.5 The java beans API **Remote Method Invocation** 5.6 Introduction to remote object RMI architecture 5.7 Stubs and skeleton 5.8 Registry 5.9 Setting up RMI 5.10 Using RMI with applet	9	1,2,3
	Total no. Of Lectures	**44**	

Reference Books :

1. The Complete Reference – JAVA Herbert Schildt
2. Core java –II By Cay S. Horstmann and Gary Corn ell
3. Compete Reference J2EE – Jim Keogh

B. C. A. (Semester VI)

603 : Recent Trends in IT

Objectives:-

1. **To introduce upcoming trends in Information technology.**
2. **To study Eco friendly software development.**

Unit No.	Topic	No. of Lectures	Reference Books
1	**Software Process And Project Metrics, Analysis Concepts And Principles** Measures, metric indicators, metric in process and the project domains, software measurement, metrics for software quality, software quality assurance, Requirement analysis, communication techniques, analysis principles, software prototyping, Case Study	6	1
2	**Distributed Databases** Standalone v/s Distributed databases, Replication, Fragmentation, Client / Server architecture, types of distributed databases **Object – Relational Databases** Abstract Data types, Nested Tables, Varying Arrays, Large Objects, Naming Conventions for Objects, Case Study	8	2
3	**Data Warehouse** What is Data Warehouse? , A Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Data cube Technology, From Data Warehousing to Data Mining, Data Mining, Functionalities, Data Cleaning, Data Integration and Transformation, Data Reduction	8	4
4	**Network Security** Cryptography; Introduction to Cryptography, Substitution Ciphers, Transposition Ciphers, One-Time Pads, Two Fundamental Cryptographic Principles; Symmetric Key Algorithms; DES-The Data Encryption Standards, AES – The Advances Encryption Standard; Public Key algorithms; RSA, Other Public Key algorithms; Digital Signatures, Symmetric-Key Signature, Public key Signature, Message Digests	14	5

5	**Computing and Informatics** Introduction to computing, Types of computing: Cloud, Green, Soft, Mobile, Case Study	8	5
	Total no. of lectures	**44**	

Reference Books :

1. Roger S. Pressman, Software Engineering **,** McGraw Hill(1997).
2. Database System Concepts by Korth, Silberschatz, Sudarshan - McGraw Hill
3. Oracle 8i – The Complete Reference, by Kevin Lon ey, Geroge Koch - Tata McGraw Hill
4. Jiawei Micheline Kamber, “Data Mining Concepts a nd Techniques”,Morgan Kauf Mann Publishers.
5. William Stallings, "Network Security Essentials", Prentice-Hall.
6. Artificial Intelligence by Elaine Rich, Kevin Knight, TMH, 2nd Edition.

B. C. A. (Semester VI)
604 : Software Testing

Objectives :-

1. **To know the concept of software testing.**
2. **To understand how to test bugs in software.**
3. **To develop programming logic.**

Unit No.	Topic	No. of lectures	Reference Books
1	**Software Testing** Introduction, Nature of errors, Testing principles & Testing fundamentals, Debugging	6	1, 2
2	**Approaches to Testing - I** White Box Testing, Black Box Testing, Gray Box Testing, Unit Testing Integration- Top-down ,Bottom up Big Bang Sandwich	10	1, 2
3	**Testing for Specialized Environments** Testing GUI's, Testing of Client/Server Architectures, Testing Documentation and Help Facilities, Testing for Real-Time Systems	10	1, 2
4	**Software Testing Strategies &Software metrics** Validation Testing, System Testing, verification, Performance Testing, Regression Testing, Agile testing, Acceptance testing ,Smoke Testing ,Load Testing, Introduction, Basic Metrics, Complexity Metrics	12	1, 2
5	**Specialized Testing & Testing Tools (Introduction)** Test Case Design, Junit, Apache Jmeter, Winrunner Loadrunner, Rational Robot	6	1, 2 www.open sourcetesting.org
	Total No. of lectures	**44**	

Reference Books:

1. Software Engineering – A Practitioners Approach, Roger S. Pressman, Tata McGraw Hill
2. Software Engineering for Students- A Programming Approach, Douglas Bell, Pearson Education