

**Solapur University, Solapur**  
**Faculty of Science**  
**Choice Based Credit System (CBCS)**  
**Structure for B. Sc (Entire Computer Science - ECS)-III**  
(w.e.f.2018-19)

Subject/ Core Course	Name and Type of the Paper		No. of papers/ Practical	Hrs/week			Total Marks Per Paper	UA	CA	Cr edi ts
	Type	Name		L	T	P				
<b>Class :→</b>	<b>B.Sc.- III Semester - V</b>									
	Ability Enhanceme nt Course (AECC)	English	Paper-III	4			100	70	30	4
	Course Course (CC)	Data Communication and Networking - I	Paper IX	3	--	--	100	70	30	3
		Theory of Computer Science	Paper X	3	--	--	100	70	30	3
		Visual Programming - I	Paper XI	3	--	--	100	70	30	3
	Discipline Specific Elective (DSE)	Web technology and E-commerce -I	Paper XII	3	--	--	100	70	30	3
		Python - I	Paper XII	3	--	--	100	70	30	3
<b>Grand Total</b>				<b>16</b>	<b>--</b>	<b>--</b>	<b>500</b>	<b>350</b>	<b>150</b>	<b>12</b>

Class :→	B.Sc.- III Semester -VI									
	Ability Enhancement Course (AE CC)	English	Paper-IV	4			100	70	30	4
	Core Course (CC)	Data Communication and Networking – II	Paper XIII	3	--	--	100	70	30	3
		Advanced Java	Paper XIV	3	--	--	100	70	30	3
		Visual Programming - II	Paper XV	3	--	--	100	70	30	3
	Discipline Specific Elective (DSE)	Web technology and E-commerce – II	Paper XVI	3	--	--	100	70	30	3
		Python - II	Paper XVI	3	--	--	100	70	30	3
<b>Total (Theory)</b>				<b>16</b>	--	--	<b>500</b>	<b>350</b>	<b>150</b>	<b>12</b>
	Core Course Practical	Based on Visual Programming – I & II	Practical IV	--	--	5	100	70	30	5
		Based on Advanced Java	Practical V	--	--	5	100	70	30	5
		Project	Software Project	--	--	5	100	70	30	5
	DSE Practical	Based on Web technology and E-commerce –I & II	Practical VII	--	--	5	100	70	30	5
		Based on Python – I & II								
<b>Total (Practicals)</b>						<b>20</b>	<b>400</b>	<b>280</b>	<b>120</b>	<b>20</b>
<b>Grand Total</b>				<b>16</b>		<b>20</b>	<b>900</b>	<b>630</b>	<b>270</b>	<b>44</b>

### Abbreviations :

- L: Lectures
- T: Tutorials
- P: Practicals
- UA : University Assessment
- CA : College Assessment
- CC: Core Course
- AEC : Ability Enhancement Course
- DSE : Discipline Specific Elective Paper

## **Data Communication and Networking - I**

### **Unit -I.**

**Introduction to Data Communication & Networking:** Data Communication: Internet: History of Internet, The ARPANET, NSFNET, Internet usage Architecture of the internet, Components, Data Representation, Data Flow, Communication Model.

Computer Network: Introduction of Network, Uses of a computer network, Network Criteria, Network Topologies, Types of Networks, Inter-networking, Applications of Internet. [6]

### **Unit -II.**

#### **Network Models:**

Protocols & Standards, Protocol Hierarchies, Design Issues of Layers, Services Primitives, Connection oriented and connection less services Reference Model: ISO-OSI reference model, TCP/IP reference model. [6]

### **Unit -III.**

#### **Physical layer :**

Signals: Analog & Digital Signals, Period, Frequency, Phase, Amplitude, Bandwidth, Bit Rate, Bit Length, Fourier analysis. Transmission Impairment: Attenuation, Distortion, Noise, Nyquist Theorem, Shannon Capacity Theorem. Transmission Media: Guided Media-Magnetic Media, Twisted Pair, Coaxial Cable, Fiber Optic Cable, Unguided Media- Wireless Radio Waves, Microwaves, Infrared, Satellite Communication Analog Transmission: Modem, Telephone System, RS232C, Modulation - Amplitude Modulation, Frequency Modulation, Phase Modulation Digital Transmission: Pulse Code Modulation, Manchester & Differential Manchester Coding. Transmission Mode: Parallel, Serial, Synchronous Transmission, Asynchronous Transmission. Multiplexing- Frequency Division Multiplexing, Time Division Multiplexing, Wavelength Division Multiplexing. Switching- Circuit Switching, Message Switching, Packet Switching. [14]

### **Unit -IV.**

#### **Data link layer:**

Data link layer Design issues, Error Detection & Correction: Types of Errors, Hamming Distance, Error Detection: Parity Check, Cyclic Redundancy Check, Checksum Check Error correction, Data Link Control: Framing, Flow & Error Control, Protocols: Simplex, Stop and Wait, Stop and Wait ARQ, Go Back N ARQ, Selective repeat ARQ. Multiple Access Protocol: ALOHA, CSMA, CSMA/CD, CSMA/CA Channelization, FDMA, TDMA, CDMA [10]

### **Unit -V.**

#### **Network layer:**

Network layer Design issues, Routing Algorithm: Optimality Principle, Shortest Path Routing, Distance Vector Routing, Link State Routing, Broadcast Routing, Multicast Routing Congestion Control Algorithm: General principle of congestion control, Congestion prevention policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram Subnets. [08]

#### **Reference Books:**

1. Computer Networking by Tannenbaum.
2. Data communication and networking by William Stallings
3. Data communication and networking by B A Forouzan
4. Data communication and networking by Jain

## Theory of computer science

### Unit -I

**Preliminaries:** Basic Definitions, Sets, Various ways of describing a Set, Subsets, operations on Sets, Infinite Sets Relations, Properties of relations, Equivalence of relations. [02]

### Unit -II

#### Finite Automata:

Introduction, Deterministic Finite Automata, Non Deterministic Finite Automata, The Equivalence of DFA's and NFA's, Finite Automata with  $\epsilon$  Moves, Equivalence of NFA with  $\epsilon$  Transitions and NFA without Transitions, Finite Automata with output, Moore Machine, Melay Machine Equivalence of Moore and Melay Machine. [12]

### Unit-III

#### Regular Expression and Properties of Regular Sets:

Regular Expression Operations on set of strings, Regular Expression, Regular Sets, Equivalence of finite automata and regular expression Properties of Regular Sets Closure properties, The pumping lemma of regular sets, Application of pumping lemma. [12]

### Unit-IV

#### Regular and Context Free Grammars:

Context Free Grammars (CFG) Derivation and Language generated by grammar, Derivation Trees, Ambiguity of CFG, Simplification of CFG, Normal forms of CFG Regular Grammars Equivalence of regular grammars and finite automata Closure properties of CFG. [08]

### Unit-V

#### Pushdown Automata:

Introduction, Definitions, Equivalence of acceptance by final state and empty stack, Definition of DPDA and NPDA their correlation and examples of NPDA, CFG(in GNF) to PDA: Method and example, Closure properties of Regular language, Application of PDA. [06]

### Unit-VI

#### Introduction of Turing Machine:

Turing Machine model and definition of TM, Language accepted by TM, Design of TM and examples. [04]

#### Reference books:

- 1) J.P. Hopcroft, Rajeev Motwani, J.D. Ullman, Introduction to Automata Theory, Languages and Computation, II Edition, Pearson Education, 2001.
- 2) John Martin, Introduction to Languages and Theory of Computation, Tata McGraw Hill, 2003.
- 3) Daniel I.A., Cohen, Introduction to Computer Theory, 2 nd Edition, John Wiley and Sons, Inc, 2000.

## Visual Programming - I

### Unit -I

#### **.NET Architecture:**

Block diagram of .net framework, The Common Language Runtime, Advantages of Managed Code, A Closer Look at Intermediate Language & Assemblies-Support for Object Orientation and Interfaces, Distinct Value and Reference Types, Strong Data Typing, Garbage Collection. [04]

### Unit –II

#### **C# Basics:**

Compiling and Running the Program, Variables, Data Types, Flow Control, Enumerations, Namespaces-The using Statement, Namespace Aliases, The Main() Method-Multiple Main() Methods, defining & using functions & its scope, Passing Arguments to Main(), Parameter passing technique. [06]

### Unit-III

#### **Objects and Types:**

Classes and Structs, Class Members- Data Members, Function Members read-only Fields, properties and indexer, The Object Class-System, Object Methods, The ToString() Method. [06]

### Unit-IV

#### **Inheritance and Polymorphism:**

Introduction-Types of Inheritance, Implementation Inheritance- Abstract Classes and Functions, Sealed Classes and Functions, Constructors and its types, Destructor, Interfaces-Defining and Implementing Interfaces, Derived Interfaces, Polymorphism - Method overloading, Operator overloading. [06]

### Unit –V

#### **Memory Management and Pointers:**

Value data types, Reference data types, Garbage collection, pointer. [06]

### Unit-VI

#### **Exception Handling:**

Introduction to Exceptions, Exception handling, The Exception Class, C# Exception Handling Keywords, The Exception Chain, Exception Hierarchy, Pre-defined Exception Classes, Catching Specific Exceptions, Throwing Objects. [04]

### Unit –VII

#### **Threading:**

Introduction- Applications with Multiple Threads, Thread Priorities, Synchronization, Life Cycle.[04]

### Unit-VIII

#### **File I/O and Streams:**

Stream Classes, Console I/O, File Stream & Byte-Oriented File I/O, Character based File I/O [04]

### Unit –IX

#### **Collection Classes:**

Generic collection, Non generic collection. [04]

**Reference books:**

1. Professional C# - Wrox Publication by Simon Robinson, Christain Nagel, Karli Watson, Jay Glynn, Morgan Skinner, Bill Evjen.
2. Inside C# - Microsoft Press by Tom Archer, Andrew Whitechapel.
3. Programming Microsoft Visual C# 2005 - The Language (Microsoft Press) by Donis Marshall

## Web Technology and E-Commerce-I

### Unit-I

#### Introduction to ASP.Net:

Introduction & difference between ASP & ASP.Net 1.1 & 2.0 Application, Web Architecture Model, Introduction to Visual Studio for Web Application. [04]

### Unit-II

#### Application and Page Frameworks:

Application Location Options-Built-In Web Server, IIS, FTP, Web Site Requiring FrontPage Extensions. The ASP.NET Page Life Cycle, the ASP.NET Page Structure Options- Inline Coding, New Code-Behind Pages. ASP.NET 2.0 Page Directives-@Page, @Master, @Control, @Import, @Implements, @Register, @Assembly, @PreviousPageType, @MasterType, @OutputCache, @Reference. ASP.NET Page Events, Dealing with PostBacks-Cross-Page Posting, ASP.NET Application Folders- \App\_Code Folder, \App\_Data Folder, \App\_Themes Folder, \App\_GlobalResourcesFolder,\App\_LocalResources, \App\_WebReferences, \App\_Browsers, Compilation, Global.asax. [08]

### Unit –III

#### ASP.NET Server Controls and Validation Controls:

ASP.Net Server Controls, Understanding Validation, Client-Side versus Server-Side Validation, Turning Off Client-Side Validation. [08]

### Unit-IV

#### Working with Master Pages:

Need and basics of Master Pages, Master Page and Content Page, Programmatically Assigning the Master Page, Nesting Master Pages, Master Page Events. [08]

### Unit –V

#### State Management:

Application State, Session State, Client & server storing, View state, Cache, Hidden Variable, Session object. [04]

### Unit-VI

#### Data Access with ADO.NET:

ADO.NET Overview, Using Database Connections, Commands-Executing Commands, Calling Stored Procedures, Fast Data Access: The Data Reader, Data Adapter. [08]

### Unit-VII

#### Introduction to electronic commerce:

Electronic commerce- The scope of electronic commerce ,definition of electronic commerce, Electronic commerce and the trade cycle, electronic markets, electronic data interchange, internet commerce, e-Commerce Perspectives. [04]

#### Reference books:

1. Professional ASP.NET 2.0 - Wrox Publication by Bill Evjen, Scott Hanselman, Farhan Muhammed, Simivasa Sivakumar, Devin Rader.
2. Microsoft ASP.NET 2.0 Step by Step - Microsoft Press By George Shepherd.
3. E-Commerce by David Whitley Tata McGraw-Hill

## Python-I

### Unit - I

#### Introduction to Python:

Features/Characteristics of Python, Installation and Working with Python, Structure of a Python Program, Writing simple python program, Executing python program using command line window and IDLE graphics window, Python Virtual Machine, Identifiers and Keywords, Operators (Arithmetic operators, Relational operators, Logical or Boolean operators, Assignment Operators, Bit wise operators, Membership operators, Identity operators), Operator Precedence and Associativity [04]

### Unit - II

#### Python Data Types:

Python Variables, Data types in python : Built-in Datatypes, Booldatatype, Sequences in python, Sets, Literals in python, User Defined Datatypes, Constants in python, Type conversion, Input and Output Statements, Command line arguments [04]

### Unit - III

#### Control Statements:

Conditional Statements: if, if-else, nested if –else,

Looping: for, while, nested loops

Loop manipulation using pass, continue, break, assert and else suite [04]

### Unit - IV

#### Strings, Collection Lists, Tuples and Dictionaries:

Strings: Introduction to String, String Manipulation.

Collection List: Introduction to List, Manipulating list.

Tuples: Introduction to Tuples, Manipulating Tuples.

Dictionaries: Concept of Dictionary, Techniques to create, update &delete dictionary items.[06]

### Unit - V

#### Functions, Modules ,Packages :

Difference between a Function and a Method

Functions: Defining a function, Calling a function, Advantages of functions, Types of functions,

Function parameters, Formal parameters, Actual parameters, Anonymous functions, Global and

Local variables

Modules: Importing module, Creating & exploring modules, Mathmodule, Random module, Time module

Understanding Packages, Programming using external packages [06]

### Unit - VI

#### Object Oriented Programming:

Features, Concept of Class & Objects, Constructor, Types of Variables, Namespaces, Types of Methods, Inner Classes, Constructors in Inheritance, Overriding Super Class Constructors and Methods, Types of Inheritance, Abstract Classes and Interfaces, The Super( ) Method, Operator Overloading, Method Overloading, Method Overriding [06]



## **Unit - VII**

### **Regular Expressions**

Introduction to Regular Expression, Advantages & Operations, Sequence characters in Regular Expression, Powerful pattern matching and searching, Password, email, url validation using regular expression, Pattern finding programs using regular expression [04]

## **Unit - VIII**

### **Exception Handling**

Errors in a Program, Exceptions, Exception handling, Types of Exceptions, User-defined Exceptions [06]

## **Unit - IX**

### **Python File Operation**

Types of File, Opening and Closing a File, Reading and writing to files, Manipulating directories [04]

### **Reference Books:**

1. Introduction to Computer Science using Python- Charles Dierbach
2. Beginning Python: Using Python 2.6 and Python 3- James Payne
3. Practical Programming: An Introduction to Computer Science Using Python 3- Paul Gries , Jennifer Campbell, Jason Montojo
4. Programming Languages – Principles and Paradigms- AdeshPandey
5. MySQL for Python: Database Access Made Easy- A. Lukaszewski

## **Data Communication and Networking - II**

### **Unit-I**

#### **Transport, Session, Presentation & Application layers:**

Elements of Transport Protocols-Addressing, Connection establishment, Connection Release, Flow Control & Buffering, TCP/IP protocol suite- Transmission Control Protocol, User Datagram Protocol, IP, Real Time Transport Protocol, FTP, DNS, TelNet, SMTP, POP, HTTP, WWW, SNMP, ARP, RARP etc., Data Compression-Audio Compression, Video Compression. [10]

### **Unit-II**

#### **Network Security:**

Introduction about Network security, Security Techniques- Encryption & decryption, Digital Signatures, Cryptography, Firewall Security Services, Authentication Mechanisms- Passwords, Smart Card, Biometrics. [10]

### **Unit-III**

#### **Network Devices & Services:**

Network Devices-Hubs, Switches, Repeaters, Bridges, Routers, Gateways Network Services- VPN, Virtual LAN, Wi-Fi Network, Remote Sensing, GPS GPRS, GSM, Bluetooth, Video Conferencing. [10]

### **Unit-IV**

#### **Web Security:**

SSL Encryption, TLS, SET, E-mail Security, PGP's / MIME, IP Security. [06]

### **Unit-V**

#### **CASE study-Linux:**

Installing client & server, Roles & responsibility of Network Administrator Server Management- Login Script, Ftp Server, News & search server, Web Server, Samba Server, Mail Server, Proxy Server, Print Server, User & group management. [06]

#### **References Books :**

1. Computer Networking by Tannenbaum.
2. Network Security Essentials by William Stallings
3. Dorothy E. Denning, "Cryptography and Data Security", Addison-Wesley
4. Data communication and networking by William Stallings
5. Complete Reference Red Hat Enterprise Linux & Fedora Edition by Petersen Haddan

## Advanced Java

### Unit-I

#### Networking:

Basics, networking classes and interfaces, using java.net package, doing TCP/IP and Datagram Programming. [04]

### Unit-II

#### Introduction to Swing Technology:

JApplet, JFrame and JComponent, Icons and Labels, Handling Threading issues, Text fields, Buttons - The JButton class, Check Boxes, Radio buttons, Combo boxes, Tabbed panes, Scroll panes, Tree, Table. [04]

### Unit-III

#### Working with databases:

Connecting to databases, Driver types, Handling Exceptions, Creating and Using Statement Objects, Using Statements to Insert, Update, Delete Data into a Database, Using the ResultSet Class, Data navigation, Prepared Statements, Callable Statements. [08]

### Unit-IV

#### Servlets:

HTTP and Server Programs, Request Methods, The Servlets Model and HTTPServletsBasic Servlet Design, A Servlet That Responds to POST Requests, The Request Object, The Response Object, Deployment Descriptors, Servlet Lifecycle, Event Logging in Servlets, Multithreading in Servlets, Session Management- Creating and Using Session, Using Cookies in Place of Sessions, Filter- Implementing the Filter Interface, Modifying the Deployment Descriptor to Use a Filter, The MVC Architecture. [12]

### Unit-V

#### JavaServer Pages:

Introduction to JSP- JSP Development, Basic JSP Lifecycle, JSP Elements, Creating and Deploying a JSP Web Application, Using Implicit Objects- The Request Object, The Response Object, The Out Object-The Session Object, The config Object, The Exception Object, The Application Object, Using Standard Actions and Implicit Objects in JSP Pages, Translation and Compilation, Handling Error and Exceptions-Dealing with Exceptions through the Page Directive, Dealing with Exceptions in the Deployment Descriptor, Adding Exception Handling in JSP Pages, Including and Forwarding from JSP Pages- Expression Language, Custom Actions and Tag Handlers JSP Standard Tag Library (JSTL). [12]

#### References books:

1. Java The complete Reference by Herbert Schildt
2. Java Servlet Programming by Jasan Hunter
3. Beginning Java EE5 from Novice to Professionals by K. Makhar & C. Zelenk
4. Java Server Programming by Bayross & Shah
5. Thinking in java by Bruceel.

## Visual Programming - II

### Unit-I

#### Delegates and Events:

Delegates-Types of Delegates, Events- The Receiver's View of Events, Generating Events [08]

### Unit-II

#### Windows base application:

Creating a Windows Form Application, Standard Controls and Components, Properties and Events of the controls, Forms-Form Class, Multiple Document Interface (MDI), Custom Controls (user Controls). [10]

### Unit-III

#### LINQ :

LINQ introduction, LINQ to SQL, Simple query, Filter value, Sort result, Group result. [08]

### Unit-IV

#### Crystal Reports:

Simple report, Conditional report [08]

### Unit-V

#### Assemblies and deployment:

Introduction, Types of assemblies, Component of assemblies, Creating assemblies, Deployment of application. [10]

### References:

1. Professional C# by Simon Robinson, Christain Nagel, Karli Watson, Jay Glynn, Morgan Skinner, Bill Evjen.
2. Inside C# - Microsoft Press by Tom Archer, Andrew Whitechapel.
3. Programming Microsoft Visual C# 2005 - The Language (Microsoft Press) by Donis Marshall

## Web Technology and E-Commerce-II

### Unit-I

#### Site Navigation:

Site Navigation technique, SiteMap file, SiteMapPath, TreeView and MenuView control, Using XML file. [04]

### Unit-II

#### ASP.Net State Management:

Application State, Session State, Client & server storing, View state, Cache, Hidden Variable, Session object, Profiles, Overview of HTTP Handler & Modules. [06]

### Unit-III

#### Security:

What is Authentication and Authorization?, Windows Authentication, Forms Authentication Passport Authentication, Anonymous Authentication, Securing pages & folders, Roles Management, Creating & Authenticating Roles, Creating & Authenticating Users Using Membership. [06]

### Unit-IV

#### Working with MVC:

Introduction to .Net MVC Framework, MVC Framework Features, MVC Architecture, MVC Components, MVC Application Folders, Configuration files, global.asax, packages.config, web.config, Working with Views, Working with Controls. [10]

### Unit-V

#### Introduction to AJAX:

What is AJAX?, Features of AJAX, Pros & Cons of AJAX, AJAX Architecture, AJAX Extension Controls, Script Manager, Update Panel Control, Update Progress, Timer, ASP.NET AJAX , Control Toolkit, Creating AJAX Application Using ASP.NET. [10]

### Unit-VI

#### Business to Business Electronic commerce:

Inter-organizational Transactions- Inter-organizational Transactions, The credit Transaction Trade cycle, A Variety of Transactions, Electronic markets, Usages of electronic markets, Advantages and disadvantages of electronic markets-Future of electronic markets, Electronic data interchange (EDI)-Introduction to EDI, EDI Definition, The benefits of EDI, EDI Example, The Elements of e-commerce- Elements, E-visibility, The e-shop, Online Payments, Delivering the goods, After sales service, Internet e-commerce security. [08]

#### Reference Books:

1. Professional ASP.NET 2 by Bill Evjen, Scott Hanselman, Farhan Muhammed, Srinivasa Sivakumar, Devin Rader.
2. Ecommerce by David Whitley Tata McGraw-Hill
3. HTML, HTML, Java script, CGI, Perl by Ivan Bayross
4. ASP.NET Black book.
5. Professional Asp.net mvc by Jon Galloway, Wrox Publication.
6. Beginning ASP.NET AJAX by Wallace B. McClure, Wrox Publication.



## **Python-II**

### **Unit - I**

#### **Multithreading :**

Understanding threads, Difference between Process and a Thread, Creating Threads, Thread Synchronization, Deadlock of Threads, Avoiding Deadlock in a Program [06]

### **Unit - II**

#### **GUI Programming**

GUI in Python, Advantages of GUI, Introduction to GUI library, Root Window, Working with Containers: Frame, Canvas

Layout Management, Events and Bindings, Font, Colors, drawing on Canvas (line, oval, rectangle, etc.)

Widgets: Label, Button, Checkbutton, Entry, Listbox, Message, Radiobutton, Text, Spinbox, Scrollbar, Menu etc.

Writing Python Programs for GUI applications [08]

### **Unit - III**

#### **Database Connectivity using MySQL**

Installation of MySQL Database Software, Installing MySQL Connector, Steps for Database Connectivity,

Working with MySQL Database : Inserting, Retrieving, Deleting and Updating the data

Working with Stored Procedure [08]

### **Unit - IV**

#### **Introduction to CGI Programming**

What is CGI?, Architecture of CGI, Web Server Configuration, Http Header, CGI Environment Variables, GET and POST Methods, File Upload, Handling Cookies, Validation and Authentication, Accessing and Managing Users [08]

### **Unit - V**

#### **XML**

Introduction to XML, XML Parser Architecture and API's, Parsing XML with SAX API's,

Parsing XML with DOM API's [04]

### **Unit - VI**

#### **Networking in Python**

Introduction to Sockets Programming, Server Socket Methods, Client Socket Methods, IP

Address, URL, TCP/IP Server, TCP/IP Client, Sending E-mail Application [08]

#### **Reference Books:**

1. Introduction to Computer Science using Python- Charles Dierbach
2. Beginning Python: Using Python 2.6 and Python 3- James Payne
3. Practical Programming: An Introduction to Computer Science Using Python 3- Paul Gries , Jennifer Campbell, Jason Montojo
4. Programming Languages – Principles and Paradigms- AdeshPandey
5. MySQL for Python: Database Access Made Easy- A. Lukaszewski

## Assignments on Visual Programming

1. Write a menu driven of a]Face value b]Armstrong c]Palindrome.
2. Write a program that implement features of cross language support.
3. Write a program that implements the following string operations-
  - a] substring b]split c]replace d]insert e] padleft.
4. Write a program to overload method.
5. Write a program that method should return object, Array.
6. Write a program for destructor.
7. Write a program for static constructor.
8. Write a program for static class.
9. Write a program for partial class.
10. Write a program for static property.
11. Write a program for indexer.
12. Write a program to implement inheritance.
13. Write a program on nesting of a namespace.
14. Write a program to overloading operator.
15. Write a program that implement interface.
16. Write a program that implement hash table.
17. Write a program that implement arraylist by using windows application.
18. Write a program that implement data structure by using windows application.
19. Write a program for delegate.
20. Write a program for Reading/Writing file by using byte stream class.
21. Write a program for copy one file to another file.
22. Write a program for Random file.
23. Write a program creating files & directories & display the following attribute-
  - 1] Name 2] Size 3] Getcreationtime by using windows application.
24. Write a program for thread .



## Assignments on Advanced Java

1. Write a java socket programming in which client sends a text and server receives it.
2. Write a program to demonstrate URL class.
3. Write a program to demonstrate InetAddress class.
4. Write a program to demonstrate use of Datagram Socket.
5. Write a program to create Student registration form using Swing Component.
6. Write the following program using Swing component.  
An Election is conducted between 3 candidates. There are N number of voters. By clicking Next Voter Button textboxes and RadioButtons need to be cleared. By clicking Results, the votes obtained by each candidate and the winner candidate to be displayed in text area. Exit button should exit program.
7. Write a program for inserting data into table using PreparedStatement.
8. Write a program for updating data into table using PreparedStatement.
9. Write a program for deleting data into table using PreparedStatement.
10. Write a program to demonstrate callable statement.
11. Write a Servlet program to check that life cycle methods are called by web container.
12. Write a program to create simple servlet for displaying welcome message.
13. Write a program to create servlet for session management using cookies.
14. Write a program to create servlet for session management using Hidden Form Field.
15. Write a program to create servlet for session management using URL Rewriting.
16. Write a simple program of authenticating user using filter.
17. Write a simple program to demonstrate the use of request dispatcher.
18. Write a simple program to demonstrate the use of Send Redirect.
19. Write a JSP program to count number of visitors.
20. Write a program for communication between HTML & JSP.

## **Assignment on Web technology**

1. Write a JavaScript for Addition, Subtraction, Division, and Multiplication of two numbers.
2. Design Webpage for employee registration form using all HTML controls and CSS.
3. Design web page for simple calculator By using class. Command name property. Button event.
4. Design web page of online shopping form which used textbox, label, buttons, and all type list controls.
5. Design Application for cross page posting.
6. Design This year calendar with all holidays in red color.
7. Design web page for image map by using Both method.
8. Design Advertisement web page.
9. Design web page which uses Multiview & View control. Wizard control. File upload control
10. Design web page for all validation control & validation Groups.
11. Create nested master pages.
12. Design web site which uses all site navigation Control.
13. Design web page which shows list of employees in selected dept.
14. Create XML & it's styles Sheet file.
15. Create Master Detail Form.

## Assignment on Python

- 1) Installing Python and setting up Python environment.
- 2) Write a program to print strings, numbers and perform simple mathematical calculations.
- 3) Write a program to implement command line arguments.
- 4) Write a program to implements conditional statements -if, if-else, nested if.
- 5) Write a program to implement loops.
- 6) Write a program to manipulate strings like string copy, string concatenation, string comparison, string length, string reverse etc.
- 7) Write program to show use of Lists and Tuples.
- 8) Write program which uses dictionaries
- 9) Write program to implement functions & Modules
- 10) Write program to implement Package.
- 11) Write a program to implement Constructors.
- 12) Write a program to implement types of Inheritance and Interfaces.
- 13) Write a program to implement Method Overloading and Method Overriding.
- 14) Write a program to implement Operator Overloading.
- 15) Write a program in to read and write contents in a file.
- 16) Write a program to demonstrate Exception handling
- 17) Write a program to demonstrate user defined exception.
- 18) Write a program to demonstrate the use of regular expressions
- 19) Write a program to draw different shapes
- 20) Write a program to develop GUI applications
- 21) Write a program to show database connectivity using MySQL to perform Insert, update and delete operations.
- 22) Write a program to implement Threads.
- 23) Write a program to implement Thread Synchronization.
- 24) Write a program in CGI to implement GET and POST methods.
- 25) Write a program to implement Client methods.
- 26) Write a program to implement Server methods
- 27) Write a program to demonstrate use of XML file.