

SHIVAJI UNIVERSITY, KOLHAPUR.



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2009

Revised Syllabus For M.Sc. Computer Science Part-I

(Subject to modifications to be made time to time)

Syllabus to be implemented from June 2013

Course structure

M.Sc. Part I - Semester I

Course Code	Title of the Course	Credits	Teaching Scheme (h/w)		Evaluation Scheme (marks)		
			L	P	CIE	SE	Total
CS2111	Theory of Languages	4	4	-	20	80	100
CS2112	Advanced Computer Networks	4	4	-	20	80	100
CS2113	Advanced Data Base Theory	4	4	-	20	80	100
CS2114	Design and Analysis of Algorithms	4	4	-	20	80	100
CS2115	Data Base Lab	4	-	12	20	80	100
CS2116	DAA and TL Lab	4	-	12	20	80	100
CS2131	CBCS (Comp.Sci / Other Dept.)	4	4	-	20	80	100
Total		28	20	24	140	560	700

M.Sc. Part I - Semester II

Course Code	Title of the Course	Credits	Teaching Scheme (h/w)		Evaluation Scheme (marks)		
			L	P	CIE	SE	Total
CS2211	Compiler Techniques	4	4	-	20	80	100
CS2212	Artificial Intelligence	4	4	-	20	80	100
CS2213	Java Programming	4	4	-	20	80	100
CS2221	Elective - I	4	4	-	20	80	100
CS2214	Java Lab	4	-	12	20	80	100
CS2215	Project	4	-	12	20	80	100
CS2231	CBCS (Comp.Sci / Other Dept.)	4	4	-	20	80	100
Total		28	20	24	140	560	700



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Master of Computer Science
Semester -I

Paper-I (CS2111): Theory Of Languages

UNIT – I

(15)

Preliminaries of F.A: Strings, alphabets and languages, graphs and trees, inductive proofs, set notations. Finite automata and regular expression: Finite state machine, Basic definitions, deterministic and non- deterministic finite automata., regular expression, Conversion of NFA to DFA.

UNIT – II

(15)

Properties of regular sets: The pumping lemma for regular sets, Closure properties of regular sets, Decision algorithm for regular sets. Minimization of Deterministic finite automata, Automata with output, Moore machine & Mealy machine , Ardens theorem, application of finite automata

UNIT – III

(15)

Context free grammar , derivation trees, simplification of Context free grammar, Chomsky normal form, Greibach normal form existence of inherently ambiguous CFL , Pumping lemma for CFL, applications.

UNIT - IV

(15)

Introduction to push down automata: Deterministic and non Deterministic push down automata. Turing Machine: Introduction, The Turing Machine Model, Computable functions, languages and Techniques for Turing Machine construction, Types of Turing machine. Unsolvable Problem: Decision problem, the halting problem.

References:

1. Theory of computer science by Mishra & chandrasekharan. 6
2. Introduction to automata theory, languages and computation –John E. Hopcroft , Rajeev motwani and Jeffery D. Ullmann Pearson education
3. Introduction to languages and the theory of computation , John C. Martin



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Semester -I
Paper-II (CS2112): Advanced Computer Networks

UNIT – I **[15]**

Introduction to computer network Fundamentals of telecommunication theory, synchronous And asynchronous transmission, Digital and analog transmission OSI architecture, TCP/IP Architecture. Local area network - Ethernet, Token Bus, Token ring, LLC and MAC Protocols, ANSI fiber distributed data interface, Multiple Access Protocols (ALOHA, CSMA/CD, CSMA/CA).

UNIT – II **[15]**

Switching and Routing - TDM, FDM, Circuit switching, Packet switching, message Switching, datagram and virtual circuit, concept of routing, routing algorithm (shortest path, Flooding, distance vector, link state routing, hierarchical) Congestion control algorithms (Leaking bucket, Token Bucket)
Wireless LAN IEEE 802.11 – architecture, physical layer, MAC layers, Bluetooth architecture, Layers- Bluetooth, radio, Base band, other upper layers.

UNIT – III **[15]**

Network Security: Traditional Cryptography-Substitution Ciphers, Transposition Ciphers, One Time Pads, Fundamental Cryptographic Principles, Digital signature(Symmetric key, public key, message digest)X.25 Network and Supporting Protocols - Features, Layers, Channel Options, Flow Control Principle, Logical Channel Status, Packet Formats, Frame Relay Architecture TCP/IP - Internetworking , IP address structure , IP datagram, Process-to Process Delivery ,UDP, TCP services and features , TCP segment .

UNIT – IV **[15]**

UNIX Networking Concepts and socket programming -Berkeley socket overview, UNIX domain protocols, socket addresses,Socket system calls, reserved ports, passing file descriptors, I/O asynchronous and multiplexing socket implementation WINSOCK programmingApplication - - Concept of well known ports, DNS, OSI application – VTAM, FTAM, Client server application – network file server Time and date routine, ping, FTP, remote logging , E-mail architecture etc.

References:

Computer Networks Protocols, Standards and Interface – Black C.
Computer Networks – Stalling A.S.
Computer Networks – Tannenbaum A.S.
Internetworking with TCP/IP : Principles, Protocols and Architecture – Comer
Computer Networks and Distributed Processing - Martin J.
Windows Network Programming – Devis R.
Unix Network Programming – Steven W.R.
Advanced Programming in unix Environment – Steven W.R.

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Semester -I
Paper-III (CS2113): Advanced Database Theory

UNIT-I (15)

Introduction to DBMS: Concept and architecture of DBMS, Introduction to conventional data models (Network, Hierarchical and Relational), Relational model : Concept, Set operations, Aggregate Function, Relational Algebra, Relational calculus, Tuple and Domain Calculus. SQL, PL/SQL.

UNIT-II (15)

Database Design: Overview of the design process, Relational database design : Functional dependencies , Normal Forms , Loss less join and Dependencies preserving decomposition
Query Optimization: Overview, Transformation of Relational expressions, Estimation of result set, Evaluation plans.

UNIT-III (15)

Transactions and Concurrency Control:- Transaction concept, transaction state, concurrent execution ,
serializability, Recoverability, Locking , Time stamp ordering , Multiple Granularity of data items.

Recovery System: - Failure classification, storage structure, recovery and atomicity, Log-based recovery

Security and protection: Role of DBA , File structure , table space , segments , User Database, Data dictionary management , memory structure , process structure .

UNIT-IV (15)

Advance techniques in databases: History of ODBMS, Concept of persistence, Problems posed by persistent objects, RDBMS to solve persistent objects, designing Object database, concept of ODBC, Object Oriented verses Relational, Introduction to parallel, distributed databases.

References:

1. Korth and Silderschut - "Database systems concepts" (TMH)
2. C.J.Date - "Introduction to database systems" (Narosa)
3. Desai B. - "Introduction to database concepts"(Galgotia)
4. Ulman J.D. - "Principles of database systems" (Galgotia)
5. Oracle installation and user manual
6. Raghu Ramakrishna-"Database management system"



Semester -I
Paper-IV (CS2114): Design and analysis of Algorithms

UNIT-I **[15]**

Introduction to algorithms, analyzing and designing algorithms, Growth functions, asymptotic notations, standard notations, Stassen's algorithm for matrix multiplication, Recurrence: Substitution method, recursion tree method, master method. Sorting and linear order statistics: Heap sort, Quick sort, Counting sort, Radix sort, Bucket sort.

UNIT-II **[15]**

Elementary Data Structures: Stacks, Queues, Linked list, applications of elementary data structures. Trees: General tree, Binary tree, binary search tree, operations on binary search tree, threaded binary search tree, AVL tree, Trie tree, Red-Black Trees, Augmenting data structures.

B-trees, B+-tree, B*-tree

UNIT-III **[15]**

Hash tables: Direct address tables, Hash tables, Hash functions, Open addressing Graphs: Representations of graph, Breadth-first search, Depth-First Search, topological sort. Minimum spanning tree: Kruskal and Prim algorithm, Single source shortest path: Bellman-Ford algorithm, Dijkstra's algorithm. All pairs shortest path: Floyd-Warshall algorithm.

UNIT-IV **[15]**

Advanced design and analysis techniques: Dynamic programming, Greedy algorithms, Divide and Conquer, Backtracking.

References:

1. Introduction to algorithms, Third Edition. by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, PHI
2. Fundamentals of Computer Algorithms, Second edition. By Ellis Horowitz, Sartaj Sahani, Sanguthevar Rajasekaran, University Press.
3. Data structures and algorithm analysis in C, Second edition. By Mark Allen weiss
4. Fundamental algorithms by Donald E. Knuth, Pearson Education.



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Semester -II

Paper-V(CS2211): Compiler Techniques

UNIT 1: (15)

Introduction to Compiling: Compilers, Phases of a compiler, Compiler construction tools, cousins of compiler. Lexical Analysis: Role of a Lexical analyzer, input buffering, specification and recognition of tokens, finite automata implications, designing a lexical analyzer generator.

UNIT 2: (15)

Syntax Analysis: Role of Parser, Writing grammars for context free environments, Top-down parsing, Recursive descent and predictive parsers (LL), Bottom-Up parsing, Operator precedence parsing, LR, SLR and LALR parsers.

UNIT 3: (15)

Syntax Directed Translation: Syntax directed definitions, construction of syntax tree, Bottom-up evaluation of S-attributed definitions, L-attributed definitions, Top-down translation and Bottom-up evaluation of inherited attributes. Intermediate Code Generation: Intermediate languages, declarations, assignment statements and Boolean expressions, case statements, back patching.

UNIT 4: (15)

Code Generation: Issues in design of a code generator and target machine, Run time storage management, code generation from Dags and the dynamic code generation algorithm. Code Optimization: Sources of optimization, Data flow analysis and equations, code improving transformation and aliases, Data flow analysis and algorithms.

References:

1. Compilers - Principles, Techniques and Tools - A.V. Aho, R. Shethi and J.D. Ullman (Pearson Education.)
2. Compiler Construction - Dhamdere (Mc-Millan)
3. Compilers - Principles, Techniques and Tools - A.V. Aho, R. Shethi and J.D. Ullman (Addison Wesley publishing company)
4. Compiler Construction - Barret, Bates, Couch (Galgotia)



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Semester -II

Paper-VI (CS2212): Artificial Intelligence

Unit I: (15)

AI Problem solving: Historical development of AI, Role of heuristic in problem solving, AI problems and Expert problems, Knowledge representation and inference, Comparison of database with knowledgebase.

Unit II: (15)

Fuzzy Systems and ANN: Predicate logic, Fact-table, Rulebase, Fuzzy logic, Case based reasoning, Design of fuzzy rulebase, Construction and implementation of knowledgebase systems, Artificial Neural Networks — concept and ANN architectures, Perceptron learning, Training and implementation of a neural network.

Unit III: (15)

Genetic Algorithms and other hybrid models: Genetic Algorithms: History and evolution of G.A, Modeling a problem for the application of G.A.—Representation of data in chromosomes, Fitness function, reproduction and convergence, Comparison of ANN and GA, Applications of G.A., Hybrid models: Combinations of ANN, Fuzzy and GA and their applications.

Unit IV: (15)

AI research: Natural Language Processing—Text categorization, text summarization, Vision and perception, image analysis and pattern matching, Robotics

References:

1. Neural networks, fuzzy logic and genetic algorithms, synthesis and applications by S. Rajsekaran, G.A. Vijayalaxmi Pai (EEE)
2. Genetic algorithms by David Goldberg (Addison and Wesley)
3. Principles of AI and Expert system development by David Rolston (MGH)
4. Artificial Intelligence by E. Ritch and K. Knight (MGH)



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Semester -II
Paper-VII(CS2213): Java Programming

Unit –I : (15)
Overview of features of java,Java virtual machine, JIT, Garbage collection, Exception handling, object serialization , Threading Swings: Introduction of JFC, swing features, model-view architecture, Heavyweight v/s lightweight components, setting pluggable look and feel for components, Swing components.

Unit-II (15)
JDBC overview , Architecture , Drivers,database connection statements , Result sets, transaction,Java Beans: Basics of designing JavaBeans, creating and using properties, using events to communicate with other components.

Unit-III (15)
Java Networking: Remote Method –introduction , architecture,defining remote objects,creating stubs and skeleton, object serialization, dynamically loaded classes, RMI activation, registrating remote objects,marshaled objects.
CORBA-concepts,object bus, distributed objects,interoperability of distributed objects, concept of open object bus, a java interface to CORBA, creating a basic CORBA server, creating CORBA clients with JavaIDL , RMI v/s CORBA. Basics of EJB

Unit-IV (15)
JSP(Java Server Pages: Introduction to JSP, Use of JSP, JSP Architecture, JSP tags, Implicit and Explicit objects, Request forward, Request –time include ,use of Beans in JSP and their scopes . Introduction to Hibernnet and Strut.
Java Servlets : servlet life cycle , servlet basics , HTTP servlets, The Servlets API , request server side – Cookies , session tracking , databases ans non-HTML content , request dispatching , shared attributes, resource abstraction.

References:-

1. The Complete Reference : Herbert Schildt-Tata McGraw Hill
2. Java Primer : Balguruswamy
3. Java 2.0 : Ivan Bayross
4. Java developer- Erik Hatcher, steve Loughran
5. Java server pages
6. Advanced Java programming- Rajendra Salokhe, Suresh Nalawade- Aruta Publication.
- 7.Black Book-Java 6—Kogent solution Inc, Dreamtech.



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Semester -II
Paper-VIII (CS2221) Elective-I : Computer Architecture

Basic Computer Organization and Design: Instruction codes, computer registers, computer instructions, timing and control, instruction cycle, memory-reference instructions, input-output and interrupt, complete computer descriptions, design of basic computer, design of accumulator logic.

Unit-II

(15)

Central Processing Unit: Introduction, General register organization, stack organization, instruction format, address modes, data transfer and manipulation, program control, reduced instruction set computer(RISC), Pipeline and vector processing: parallel processing, pipelining, arithmetic pipeline, instruction pipeline, RISC pipeline, vector processing, array processors.

Unit-III

(15)

Input-Output organization: Peripheral devices, input-output interface, asynchronous data transfer, modes of data transfer, priority interrupt, DMA, input-output processor, serial communications.

Unit-IV

(15)

Memory organization: memory hierarchy, main memory, auxiliary memory, associative memory, cache memory, virtual memory, memory management hardware, Multiprocessors: Characteristics of multiprocessors, interconnections structures.

References:

- 1) Computer System Architecture ----- M Morris Mano (Pearson Education)
- 2) Computer Architecture ---- William Stallings
- 3) Computer Architecture ----- Hwang Briggs
- 4) Computer Architecture and Organization ----- J P Hayes (MGH)
- 5) Computer System Architecture ----- Baer J L (Computer Science press)



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Master of Computer Science

Semester -II

Paper-VIII (CS2221) Elective-I : Data Warehouse

Unit-I

(15)

Data Warehouse: The Building Blocks Defining features, Data warehouses and Data Marts, Overview of the Components, Metadata in the Data Warehouse, The Architectural Components: Understanding Data Warehouse Architecture, Distinguishing characteristics, Architectural Framework, Technical Architecture

Unit-II (15)

The Significant Role of Metadata: Importance of Metadata, Metadata Types by Functional Areas, Business Metadata, Technical Metadata, How to Provide Metadata,

Unit-III (15)

Principles of Dimensional Modeling: From Requirements to Data Design, The STAR Schema, STAR Schema Keys, Advantages of the STAR Schema, Dimensional Modeling Advanced Topics: Updates to the Dimension Tables, Miscellaneous Dimensions, The Snowflake Schema, Aggregate Fact Tables, Families of STARS

Unit-IV (15)

Data Extraction, Transformation, and Loading: ETL Overview, Data Extraction, Data Transformation, Data Loading, OLAP in the Data Warehouse: Demand for Online Analytical Processing, Major Features and Functions, OLAP Models, OLAP Implementation considerations.

References:

- 1) Data Warehousing Fundamentals ---Paulraj Ponniah (Wiley Publications)
- 2) data Warehousing in real world – Sam Anahory, dennis murray
- 3) data Warehousing – Amitesh sinha
- 4)Data mining – Pieter adrians, dolf zantinge.



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Semester -II
Paper-VIII (CS2221) Elective-I : Network Security

Unit I: (15)

Introduction: Attacks, Services and Mechanisms, Security Attacks, Security Services, Integrity check, digital Signature, authentication, hash algorithms. Secret Key Cryptography: Block Encryption, DES rounds, S-Boxes IDEA: Overview, comparison with DES, Key expansion,

IDEA rounds, Uses of Secret key Cryptography; ECB, CBC, OFB, CFB, Multiple encryptions DES.

Unit II: (15)

Hash Functions and Message Digests: Length of hash, uses, algorithms (MD2, MD4, MD5, SHA) MD2: Algorithm (Padding, checksum, passes.) MD4 and 5: algorithm (padding, stages, digest computation.) SHA: Overview, padding, stages. Public key Cryptography: Algorithms, examples, Modular arithmetic (addition, multiplication, inverse, and exponentiation) RSA: generating keys, encryption and decryption. Other Algorithms: PKCS, Diffie-Hellman, El-Gamal signatures, DSS, Zero-knowledge signatures.

Unit III: (15)

Authentication: Password Based, Address Based, Cryptographic Authentication. Passwords in distributed systems, on-line vs offline guessing, storing. Cryptographic Authentication: passwords as keys, protocols, KDC's Certification Revocation, Interdomain, groups, delegation. Authentication of People: Verification techniques, passwords, length of passwords, password distribution, smart cards, biometrics. Security Policies and Security Handshake Pitfalls: Protocol problems, assumptions, Shared secret protocols, public key protocols, mutual authentication, reflection attacks, use of timestamps, nonce and sequence numbers, session keys, one-and two-way public key based authentication.

Unit IV: (15)

Example System: Kerberos: purpose, authentication, server and ticket granting server, keys and tickets, use of AS and TGS, replicated servers. Kerberos V4: names, inter-realm authentication, Key version numbers. Kerberos V5: names, realms, delegation, forwarding and proxies, ticket lifetimes, revoking tickets, multiple Realms. Network Security: Electronic mail security, IP security, Network management security. Security for electronic commerce: SSL, SET .System Security: Intruders and Viruses, Firewalls, Intrusion Detection

References:

1. Atul Kahate, Cryptography and Network Security, McGraw Hill.
2. Kaufman, c., Perlman, R., and Speciner, M., Network Security, Private Communication in a public world, 2nd ed., Prentice Hall PTR., 2002.
3. Stallings, W., Cryptography and Network Security: Principles and Practice, 3rd ed., Prentice Hall PTR., 2003.
4. Stallings, W. Network security Essentials: Applications and standards, Prentice Hall, 2000.
5. Cryptography and Network Security; McGraw Hill; Behrouz A Forouzan.
6. Information Security Intelligence Cryptographic Principles and App. Calabrese Thomson.
7. Securing A Wireless Network Chris Hurley SPD.



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Master of Computer Science

Semester -II

Paper-VIII (CS2221) Elective-I : Parallel Computing

Unit-I (15)

Parallel Computer Models – Multiprocessors and Multicomputers – Multi Vector and SIMD Computers – Conditions of Parallelism – Program flow Mechanisms – System Interconnect architecture – Parallel Processing Applications. Introduction of Parallel Computing, Implicit Parallelism, Dichotomy of Parallel Computing Platforms, Physical Organizations of Parallel Platforms, Cache Coherence in Multiprocessor System, Communication Costs in parallel

machines. Routing mechanism for interconnection networks, Impact of process-processor mapping and mapping techniques.

Unit-II

(15)

Principles Of Parallel Algorithm Design: Basics of computation, Decomposition techniques, mapping techniques for load balancing. Parallel Algorithm Models. Communication Operations: One-to-All Broadcast and All-to-one reduction, All-to-All Broadcast and Reduction, All-Reduce and prefix-Sum operations. Scatter and Gather All to-All personalized communication, Circular Shift.

Unit-III

(15)

Message Passing Computing : Principles of Message Passing Programming , send and receive operations , Message passing interface, Topologies and embedding, Overlapping Communication with computation, Collective communication and Computation Operations, Groups and communicators, MPI programming.

Unit-IV

(15)

SELECTION: Introduction , The problem and a lower bound, Sequential algorithm, Parallel algorithm. Merging, Merging network, merging on PRAM models , Sequential and , Parallel Merging. Sorting on linear array, Sorting on PRAM models. Searching on PRAM model , Matrix Operations on PRAM models.

References :

1. Anath Grama, Anshul Gupta, George Karypis and Vipin Kumar-Introduction to parallel Computing.
2. V. Rajaraman - Elements of Parallel Computing (PHI)
3. Selim Akl - The design and analysis of parallel algorithms (PHI)
4. Kai Hwang, Advanced Computer Architecture Parallelism Scalability Programmability, TMH (2001)
5. Michael J. Quinn, Parallel Computing Theory and Practice, McGrawHill
6. Michael J. Quinn Parallel Programming in C with MPI and OpenMP McGrawHill



Shivaji University, Kolhapur
Department of Computer Science

Courses under CBCS for MSc

Odd Semester

Course Code	Title of the Course	Credits	Teaching Scheme (h/w)		Evaluation Scheme (marks)		
			L	P	CIE	SE	Total
CS2131 [MSc]	Web Designing	4	4	-	20	80	100

Even Semester

Course Code	Title of the Course	Credits	Teaching Scheme (h/w)		Evaluation Scheme (marks)		
			L	P	CIE	SE	Total
CS2231[MSc]	Software Engineering	4	4	-	20	80	100

Department of Computer Science,

Shivaji University, Kolhapur.

A Course under Choice Based Credit System (CBCS)

- **Course code:** CS2131
- **Title of the course :**Web Designing
- **Department at which course will be conducted :**Department of Computer Science, Shivaji University, Kolhapur.
- **Duration:** 8 weeks
- **Contact Session:** Theory 30 Hours and Practical: 24 Hours
- **Credits:** 4
(2 credit for 30 Theory hrs. and 2 credit for 24 Practical hrs)
- **Course Coordinator/Instructor:**
- **Eligibility:** Any Graduate
- **Intake:** Min: (30) max.: (70)
- **Course Fee:** Rs. 3,000/- only for students of other departments
- **Course offered during :** Odd Semester
- **Course Contents:**

Semester –I

Web Designing

Unit 1: (15 Lectures)

Introduction to Internet: Definition of Internet – History of Internet - Packet Switching – Different types of Connections : Dial-up connection – ISDN – Advantages and Disadvantages – ADSL Connection – Advantages and Disadvantages – DSL – Leased Line – Satellite Connections - Modem - Cable Modem – Internet tools - Web server - Domain name - Search Engines – Web browser – IP address – Versions (concepts only) – Internet Protocols – TCP/IP – FTP – HTTP – TelNet –WAIS

Unit 2: (15 Lectures)

Introduction to HTML: Introduction - Basic Tags of HTML - HTML Tag - TITLE Tag - BODY Tag ; Formatting of Text : Headers - Formatting Tags: BOLD, ITALICS, UNDERLINE, PARAGRAPH, TT, STRIKETHROUGH, EM, BR and HR tags - PRE Tag - FONT Tag - Special Characters - Working with Images - META Tag

Unit 3: (15 Lectures)

Advanced HTML: Links - Anchor tag – Lists - Unordered Lists - Ordered Lists – Definition Lists; Tables - TABLE, TR and TD Tags - Colspan and Rowspan; Frames: Frameset - FRAME Tag – Frame inside other frames – NOFRAMES Tag ; Forms : FORM and INPUT Tag - Text Box - Radio Button – Checkbox – SELECT Tag and Pull Down Lists : Hidden - Submit and Reset ; Some Special Tags: COLGROUP - THREAD, TBODY, TFOOT - _blank, _self, _parent, _top – IFRAME – LABEL - Attribute for <SELECT> - TEXTAREA

Unit 4: (15 Lectures)

CSS: Introduction – Features – Style Sheet basics - Working with CSS files – Syntax - Types of Style Sheets Inline Styles - Embedded Styles - External or Linked Styles

Formatting Text and Fonts: Font Families Font Size Kerning, Leading, and Indenting - Formatting Colors and Backgrounds: The Color Attribute The Background Attribute Background Colors and Images

Exploring CSS Class and ID Attributes: Defining the CSS Class Attribute – Defining the CSS ID Attribute - Dynamic effects with CSS - Lists- Tables – Forms - simple Examples using above properties.

Lab Exercises

Assignment HTML 1: Lab Exercises

The following exercises are designed to give you practice in writing HTML code and creating a web page. After completing the following exercises, give your trainer the disk with the files that you have created and saved.

Before starting this set of exercises you must understand the process of editing HTML. The most basic method is to use a simple word processor like Note Pad or Word Pad (found in the Windows Accessories group) or SimpleText for the Mac. Here's the drill:

1. Type your HTML code into the editor.
2. Save the file (you can do this at any point if you want to view your work). Remember where you save it to.

3. View your work by going to your WWW browser and choosing **Open File** from the **File** Menu and navigate to your saved html file to view it. When you go back to the editor to make more additions or changes, and then you come back to the browser, you don't need to re-open the page each time. Use the **Refresh** or **Reload** Button to get the most recent version of your file.
4. Tip: If you leave both the editor and browser open you can toggle back and forth between them using the **alt-tab** command or the program buttons on the task bar (PC only). On a Mac you will need to cascade the two windows.

Basic Tags: Lab Exercise

1. Create a simple HTML document about yourself or a topic of your choice using the basic tags learned in the first lesson. (Keep it simple for these exercises. You will be designing a "real" web page later.)
 2. Save the document as an .htm file and remember where you saved it (name it yournamefile1.htm). If you are using a Mac, you should use the .html file extension.
 3. Launch your WWW browser. If you are already in your web browser (reading this tutorial!), you may want to open a second browser window.
 4. View your file in the browser by selecting **Open File** from the **File** menu. This may differ somewhat from browser to browser.
 5. Add bold and italic words to your document, save and view.
 6. Add a header to your document, save and view.
 7. Add paragraph and break tags to your document, save and view.
 8. Add a horizontal rule where appropriate, save and view.
-

Lists: Lab Exercise

1. Add an unordered list to your document, save and view.
 2. Add an ordered list to your document, save and view.
 3. Add a definition list to your document, save and view.
-

Links: Lab Exercise

1. Create a new file called *yournamefile2.htm* (it can be very basic).
 2. Create a link to Yahoo (<http://www.yahoo.com>).
 3. Create a link from *yournamefile2.htm* to *yournamefile1.htm*.
-

Images: Lab Exercise

1. Open one of your HTML files in your editor.
2. Add an image to your document using the tag, `<IMG SRC="image.gif">` (Note: **image.gif** is a generic name. Your image may be **horse.gif** or **scenery.gif**. Also, the

image must be placed in the same directory or folder as your HTML file. Although the image *can* be in another directory, the way to reference that image in your image tag isn't a part of this exercise). Save and view. You can obtain images in several ways:

1. You can save any image off the Internet by clicking on the image (click and hold down on the Mac til the pop-up menu appears)(right-click for PC's) and saving it to disk. There are many free resources out there on the Internet that you can take advantage of. Note that many images are copyrighted and may not be freely used.
 2. You can scan an image and save it as a .gif or .jpg file with image editing software.
 3. You can create your own images with image editing software.
 3. Align a short description to the bottom of you image, save and view.
 4. Align the description to the top of the image, save and view.
-

Tables: Lab Exercise

1. Add a simple table to *yournamefile1.htm* without borders. Make the table with 2 rows and columns, save and view.
 2. Add border value of 1, save and view.
 3. Add a border value of 5, save and view.
 4. Make the top row a table header, save and view.
 5. Align all data elements to the middle of their cells, save and view.
-

Netscape Extensions: Lab Exercise

1. Center one of your headers in *yournamefile1.htm*, save and view.
2. Center your image, save and view.
3. Align the image to the right, save and view.
4. Put a border around the image with a value of 1; save and view each.
5. Add a horizontal rule that is aligned to the left, is 50% of the width of the page and has a size value of 5, save and view.
6. Give some text (non-header) a font size value of +3, save and view.
7. Put a background color and text color on your page. In order to do this you must obtain the hexadecimal value for the color you want to use. Click [here](#) to view colors and their associated hexadecimal values. The hex values are at the top of each color swatch (a 6 digit alpha-numeric number). Just plug the value in at the appropriate place in your **Body** tag.

Back to [Netscape Extensions](#) tutorial

Assignment HTML 2: Your Personal Web Page

As a final exercise, try to put all of the HTML tags that you have learned to use by creating a real page; either a personal home page or something relating to your work or some other interest you have. Submit this web page to your trainer after saving it on a disk.

Optional

Once your page is complete, you must find a WWW server to host your page if you want anyone to be able to access it. Here are a few options:

1. You may have a personal web site that comes with your Internet account. You should ask your Internet Service Provider (ISP) how to place your page on this personal web site. It differs from one ISP to another.
 2. You may have a web server at your place of work where you can post your page. Ask your system administrator if this is available to you.
 3. You can rent space on a commercial web server. Most ISP's offer this service.
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Editors

We have attempted to teach you some of the basic HTML tags in this tutorial. Many people don't feel that it is important to learn HTML code anymore, since there are many editors and document converters out there that don't require any knowledge of HTML. Our experience has been that even with these tools there are often times when you still need to edit the code to make things look right. There are four basic types of editors:

1. Basic text editors like Wordpad and SimpleText
2. HTML editors that provide many shortcuts to hand coding, but still basically work with HTML.
3. WYSIWYG (what you see is what you get) editors that add html code automatically.
4. Document converters that allow conversion of word processor documents and spreadsheets .

- **Examination:**

Theory: 50 Marks (25 Objective Questions)

Practical: 50 Marks

Four Questions-30 Marks (Solve any two)

Two Questions – 20 Marks (Solve any one)

- **Text Books/Reference Books:**

TEXT BOOKS

- Web Technology - N.P. Goplan, J.Akilandeswari
- Internet Technology and Web Design - ISRD Group
- HTML and Web designing - Kris Jamsa and Konrad King
- Ajax for Beginners - Ivon Bayross Sharanam Shah

REFERENCES

- Teach yourself Web Technologies - Ivan Bayross - Reprinted 2011 Second Edition
- Web Technology - Ramesh Bangia - Reprint 2008
- HTML for Beginners - Firuza Aibava- Second Edition
- Internet and Web Design - Ramesh Bangia, Firewall Media
- Web Design - Jenkins, Wiley India
- HTML and Web designing - Kris Jama and Konrad King, Tata McGraw Hill Publishing Ltd
- Using HTML 4, XML and Java 1.2 - Eric Ladd and Jin O' Donwell, Prentice Hall of India, New Delhi
- Web Technology and Design- C. Xavier, New Age International Publishers
- Java Server Pages-Ivan Bayross, Shroff publishers & Distributors Pvt Ltd, Delhi
- Teach yourself web Technologies - Ivon Bayross , BPB publications – 2002
- Web programming -Chris Bates, Wiley – Dreamtech India Pvt Ltd

• Any other information:

COMPUTER ROOM RULES

- No eating or drinking
- Any internet searching must be assigned and related to classroom assignments or your account will be disabled for 2 days for the first offense, 3 days for the second, and so on (this includes checking personal email). PLAYING GAMES IS NEVER TOLERATED!!!!
- Do not download anything from the internet/email without approval from the teacher.

Department of Computer Science,
Shivaji University, Kolhapur
A Course under Choice Based Credit System (CBCS)

- **Course code:** CS2231
- **Title of the course :** Software Engineering
- **Department at which course will be conducted:** Department of Computer Science, Shivaji University, Kolhapur.
- **Duration:** 15 weeks
- **Contact Session:** Theory 60 Hours
- **Credits:** 4
(4 credit for 60 Theory hrs.)
- **Course Coordinator/Instructor:**
- **Eligibility:** Any Graduate
- **Intake : Minimum 30 and Maximum 70**
- **Course Fee:** Rs. 3,000/- only for students of other departments
- **Course offered during :** Even Semester
- **Course Contents:**

Master of Computer Science

Semester –II

Software Engineering

UNIT-I

(15)

Introduction to Software Engineering: The Software Engineering Discipline, Evolution of an art into engineering discipline, A solution to the software crisis. Software development projects: Programs versus products, types of software development projects, Emergence of software Engineering.

UNIT-II

(15)

Scheduling and Management: Staffing level estimation, Effect of schedule change on cost, Work Breakdown structure, Gantt chart, PERT charts, Project monitoring and control. Organization and Team structure, staffing, Software Configuration Management, SCCS and RCS, Risk Management

UNIT-III

(15)

Requirement Analysis and Specification : Requirement gathering and analysis
Software requirement specification(SRS): Characteristics, Functional requirements, Identification and documentation of requirement, Example.

UNIT-IV

(15)

Coding and Testing: Introduction, coding standards, code review. Software documentation: Internal Documentation and External Documentation.
Testing: Basic concepts and terminologies, testing in large system versus small system, types of testing, debugging.

- Text Books/Reference Books:

- 1) Fundamentals of Software Engineering-Rajib Mall
- 2) E Awad System Analysis and Design
- 3) Fairly Software engineering concepts
- 4) Krishna Moorthy Handbook of Software engineering
- 5) Perry Edwards System Analysis and Design
- 6) Pankaj Jalote Integrated approaches to Software engineering
- 7) R S Pressman Software engineering -- Practitioners approach



Shivaji University, Kolhapur
Department of Computer Science

Add-on Courses under CBCS

Odd Semester

Course Code	Title of the Course	Credits	Teaching Scheme (h/w)		Evaluation Scheme (marks)		
			L	P	CIE	SE	Total
CSA11	Fundamentals of C Programming	2	1	3	10	40	50
CSA12	Fundamentals of C++ Programming	2	1	3	10	40	50
CSA13	Core Java Programming	2	1	3	10	40	50
CSA14	Web Programming	2	1	3	10	40	50
CSA15	PHP	2	1	3	10	40	50
CSA16	Visual Basic	2	1	3	10	40	50
CSA17	Android	1	1	-	05	20	25
CSA18	Silver Light	1	1	-	05	20	25

Even Semester

Course Code	Title of the Course	Credits	Teaching Scheme (h/w)		Evaluation Scheme (marks)		
			L	P	CIE	SE	Total
CSA01	Advanced C Programming	2	1	3	10	40	50
CSA02	Advanced C++ Programming	2	1	3	10	40	50
CSA03	Advanced Java Programming	2	1	3	10	40	50
CSA04	Dot Net Programming	2	1	3	10	40	50
CSA05	Computer Networks	2	1	3	10	40	50
CSA06	Tally	2	1	3	10	40	50
CSA07	Hadoop	1	1	-	05	20	25

Department of Computer Science,
Shivaji University, Kolhapur
Add-on Course under CBCS

- **Course code:** CSA11
- **Title of the course :** Fundamental of C Programming
- **Department at which course will be conducted :** Computer Science
- **Duration:** 4 weeks
- **Contact Session:** Theory- 15 Hours and Practical 12 Hours
- **Credits:** 2
(1 Credit for 15 Theory Hrs and 1 Credit for 12 Practical Hrs)
- **Course Coordinator/Instructor:**
- **Eligibility:** Any graduate with computer knowledge
- **Intake:** Min: (10) Max.: (15)
- **Course offered during :** Odd semester
- **Course Fee:** Rs 3000/-
- **Course Contents:**

Unit-I:

(15)

Introduction to C : History, Structure of a C program, Keywords, Identifiers - Variables, Constants, Escape sequences, Data types – built-in and user defined, Operators, Formatted input and output. **Control Structures:**

Decision making structure, switch, Loops **Functions in C:** Introduction, Advantages, User defined functions: Declaration, definition, function call, parameter passing (by value), return keyword, void, Scope of variables.

Practical:

(12)

Programs, Decision making using control statements, looping, Declaring functions.

- **Text Books/Reference Books:**

1. Yashwant Kanetkar : Let Us C
2. Kernighan and Ritchie : The C Programming language
3. Herbert Schildt : Complete C Reference

**Department of Computer Science,
Shivaji University, Kolhapur
Add-on Course under CBCS**

- **Course code:** CSA12
- **Title of the course :** Fundamentals of C++ Programming
- **Department at which course will be conducted:** Computer Science
- **Duration:** 4 weeks
- **Contact Session:** Theory- 15 Hours and Practical -12Hours
- **Credits:** 2
(1 credit for 15 Theory hrs. and 1 credit for 12 Practical hrs. per week)
- **Course Coordinator/Instructor:**
- **Eligibility:** Any Graduate with knowledge of C language.
- **Intake:** Min: (10) Max.: (15)
- **Course offered during :** Even semester
- **Course Fee:** Rs 3000/-
- **Course Contents:**

UNIT-I

(15)

Introduction to Object Oriented Paradigms: Basic Terminology and features.

Skeleton of an Object Oriented Program: Creating and Using Classes and members, Constructors, Destructors. Static data members and functions, friend function, this pointer, composition Operator Overloading fundamentals: Overloading unary and binary operator.

Practical Work: Creating and Using Classes, operator overloading concepts, friend Function.

Practical Assignment:

1. Write a program to implement student class and access its data members.
2. Write a Program to implement Account class with member functions to Interest, show balance, withdraw and deposit amount from account.
3. Write a program to implement flight class with data members as flight_no, source, destination and fare. Write a copy constructor and member function to display information.
4. Write a program to implement friend function.
5. Write a class fraction and overload following operators: +, -, *, /.

6. Design and implement a class “MyMatrix” that can store a matrix as a two dimensional array size 3*3. The class have a constructor that initializes all the elements of array to 0. Also write two functions one for displaying the matrix and one for input of the elements of matrix. Finally, write an overloaded multiplication (*) operator that multiplies two matrices.
7. Design and implement a class “MyDate” using C++ that stores day, month and year as variable. The class has a constructor that initializes the date to '01-01-2013'. The class has a function that allows changes in the date, but only after proper checking about the validity of the date. You may assume that this date class can have date in the range 01-01-2013 to 01-01-2020. The class has an overloaded minus operator (-) function that finds the difference in the years of the two dates and a function to display the date.
8. Design and implement a class “MyArray” using C++ that stores a single dimensional array of a maximum size 10. An array in this class may consist of upto 10 elements. The size of stored array is also kept in a number variable. The class should have appropriate constructor. Also implement an overloaded ‘+’ operator that allows addition of two arrays as follows:
 - a.If the size of the two arrays being added is not same it returns an error message.
 - b.Otherwise it adds each corresponding elements of the array.
9. Design and implement a class Daymonth using C++. The Daymonth class stores the day and month of the current year in two variables. (For example 5th March 2009 will be stored as dd=5 and mm=3). This class has a function to find the day of the year. (For example, 5th March is 31+28+5 = 64th day of the year 2009). The class also has a function to print the data stored in the object. Implement the class with suitable constructor, and member variables.
10. Create a class “time” that has separate int data member for hours, minutes and seconds. One constructor should initialize this data to 0 and another should initialize it to fixed values. Write a member function to display the time in the format 11 : 40 : 30. The final member function should add two objects of type time passed as argument.

• **Text Books/Reference Books:**

- 1.C++ Primer – Lippman
- 2.C++ How to program – Deitel & Deitel (Pearson Education)
3. A.L.Stevens - " C++ database development"
4. Mastering C++ - K.R.VenuGopal, Rajkumar, T. RaniShankar (TMG)
5. Effective C++ - Scott Meyers (Pearson Education)
6. Object Oriented Programming in C++ - R. Subburaj (Vikas Publication)
7. Rambaugh et.al. - " Object Oriented Modeling and Designing"
9. Grady Booch -"Object Orient Analysis and Design with applications"
10. Bjarne Stroustrup - "The C++ programming language"(Addison Wesley)

**Department of Computer Science,
Shivaji University, Kolhapur
Add-on Course under CBCS**

- **Course code:** CSA13
- **Title of the course :** Core Java Programming

- **Department at which course will be conducted:** Computer Science
- **Duration:** 4 weeks
- **Contact Session:** Theory- 15 Hours and Practical: 12 hours
- **Credits:** 2
(1 credit for 15 Theory hrs. and 1 credit for 12 Practical hrs. per week)
- **Course Coordinator/Instructor:**
- **Eligibility:** Science graduate and knowledge of C++
- **Intake:** Min: (10) Max.: (15)
- **Course offered during :** Odd semester
- **Course Fee:** Rs. 4,000/-
- **Course Contents:**

Unit-I

(15 hrs)

Introduction: Introduction about JAVA, JVM(JAVA Virtual Machine), JAVA Class, Creating Object for class, References, The Java.lang.Object class. Method Signature, Garbage Collection, Accessing Methods and Fields, Constructor, Super key, final key.

Advanced Concepts: Inheritance, is a relationship, Packages overview, adding class to packages, directory structure of packages, Exception Handling. A Simple Java Program, Object Creation, Using Java.lang.Object class in program, programs using inheritance, using packages in java program.

Programs on Exception handling.

Practical Assignments

1. Develop a class name HelloWorld.
2. Develop a java application which creates Employee class with Emp object.
3. Develop a class which provides a constructor having 2 parameters.
4. Create a Employee class with its id, name, add, salary as the class fields.
5. Develop a java application having Person class which inherits 2 other subclasses named as male and female .
6. Develop a class Vehicle having package in it.
7. Develop a class PrimeNumber which throws multiple exceptions.
8. Develop a java application for the Employee class having name, id, address, salary, as the fields also calculate salary of a employee by using computePay() method.
9. Develop a java application calling objects, methods by super key.
10. Develop a java application named as FinalDemo using final key.

- **Text Books/Reference Books:**

- 1) Learning Java- Rich Raposa-Wiley, DreamTech Publication
- 2) The complete Reference Java- 5th edition – Herbert Schildt- Tata McGraw Hill

Department of Computer Science,

Shivaji University, Kolhapur

Add-on Course under CBCS

- **Course code:** CSA14
- **Title of the course:** Web Programming
- **Department at which course will be conducted:** Computer Science
- **Duration:** 4 weeks
- **Contact Session:** Theory- 15 Hours and Practical : 12 Hours
- **Credits:** 2
(1 Credit for 15 Theory Hrs and 1 Credit for 12 Practical Hrs)
- **Course Coordinator/Instructor:**
- **Eligibility:** Programming knowledge of C.
- **Intake:** Min: (10) Max.: (15)
- **Course offered during :** Odd Semester
- **Course Fee:** Rs. 4000/-
- **Course Contents :**

UNIT I:

15 Hours

HTML: WWW, Basic tags of HTML, Formatting Tags, Images and Linking, List and Table Structure. Forms and Controls: Form, Text box, Radio, Checkbox, Button **CSS:** Concept of style sheet, Types of Style sheet, Inline Style Sheet, External Style sheet and examples on it, Embedded Style Sheet and Examples **Java Script:** Introduction to Java Script, Variables, Keywords, operators, statements, iterative statements, Functions.

- **Text Books/Reference Books:**
 1. Teach yourself web technologies part I & II- I. Bayross. BPB
 2. Beginning PHP and MySQL From Novice to Professional - W. Jason Gilmore
 3. Professional JavaScript for Web Developers – Nicholas C. Zakas

Department of Computer Science,
Shivaji University, Kolhapur
Add-on Course under CBCS

- **Course code:** CSA15
- **Title of the course :** PHP
- **Department at which course will be conducted :** Computer Science
- **Duration:** 4 weeks
- **Contact Session:** Theory- 15 Hours and Practical: 12 hours
- **Credits:** 2

(1 credit for 15 Theory hrs. and 1 credit for 12 Practical hrs. per week)

- **Course Coordinator/Instructor:**
- **Eligibility:** Science graduate, knowledge of C.
- **Intake:** Min: (10) Max.: (15)
- **Course offered during :** Odd semester
- **Course Fee:** Rs. 4,000/-
- **Course Contents:**

Unit-I

(15 hrs)

What is PHP, HTML, XML, Basic Introduction to PHP, Installation, Syntax, Variables, String, Operators, Control structure if, If...Else, while, do...while, Switch, Arrays, Loops, Functions, PHP Forms, \$_GET, \$_POST method. PHP Concepts: Date, Include, File, File Upload, Cookies, Sessions, PHP Secure E-mail, PHP Errors, PHP Exception, PHP Filter etc. MySQL Introduction, Creation, Connection, Implementing queries as Insert, Select, Where, Order By, Update, Delete, PHP ODBC...Advanced Concepts in PHP: Web designing using advanced concepts PHP XML: XML Expat Parser, XML DOM, SimpleXML

- **Text Books/Reference Books:**

1. PHP & MySQL the missing manual by Breet McLaughlin 1st edition
2. PHP 5 Power Programming by Andi Gutmans, Stig Saether Bakken, And Derick Rethans.
3. PHP, MySQL, CSS by Robin Nixon 4th edition.

Department of Computer Science,

Shivaji University, Kolhapur

Add-on Course under CBCS

- **Course code:** CSA16
- **Title of the course:** Visual Basic
- **Department at which course will be conducted :** Computer Science
- **Duration:** 4 weeks
- **Contact Session:** Theory-15 Hours and Practical:12 Hours
- **Credits:** 2
(1 Credit for 15 Theory Hrs and 1 Credit for 12 Practical Hrs)
- **Course Coordinator/Instructor:**
- **Eligibility:** Programming knowledge of C.
- **Intake:** Min: (10) Max.: (15)
- **Course offered during :** Odd Semester
- **Course Fee:** Rs. 3000/-
- **Course Contents :**

UNIT 1:

15 Hours

Introduction Graphical User Interface (GUI), Programming Language (Procedural, Object Oriented, Event Driven), The Visual Basic Environment. Textbox, Frames, Check Boxes , Option Buttons, Images, tab controls, shapes, List box. Variables, Constants, Data Types, Scope of variable. If Statement, If ?then-else Statement, Comparing Strings, Compound Conditions, Nested If Statements, Case Structure ,Using If statements with Option Buttons & Check Boxes, Message Box, Using Call Statement to call a procedure. Defining / Creating and Modifying a Menu, Using common dialog box, Creating a new sub-procedure, Passing Variables to Procedures, Passing Argument ByVal or ByRef, Writing a Function Procedure.

- **Text Books/Reference Books:**
 1. Steven Holzner, Visual BASIC - programming Black Book (BPB)
 2. Steve Brown, Visual BASIC (BPB)
 3. Evangelos Petroustos, Mastering Visual BASIC (BPB)

Department of Computer Science,

Shivaji University, Kolhapur
Add-on Course under CBCS

- **Course Code:** CSA17
- **Title of the course :** Android
- **Department at which course will be conducted :** Computer Science,
- **Duration:** 4 Weeks
- **Contact Session:** Theory-15 Hours
- **Credits:**1
(1 Credit for 15 Theory Hrs)
- **Course Coordinator/Instructor:**
- **Eligibility:** Any Graduate
- **Intake:** Min: (10) Max.: (20)
- **Course offered during :** Odd Semester
- **Course Fee:** Rs 3000/-
- **Course Contents:**

Unit1

(15 Lectures)

Introduction to Android, Android Architecture, Basics of android application development, Working with android user interfaces, File management in android, Working with multimedia objects, Database management in android , Distributive computing in android, Working with real-time application scenarios.

• **Text Books/Reference Books:**

1. Learning Android (Paperback) by Marko Gargenta
2. Android in Action by W. Frank Ableson (Author)
3. Hello, Android: Introducing Google's Mobile Development Platform
by Ed Burnette

Department of Computer Science,
Shivaji University, Kolhapur

Add-on Course under CBCS

- **Course Code:** CSA18
- **Title of the course:** Silverlight
- **Department at which course will be conducted :** Computer Science
- **Duration:** 2 weeks
- **Contact Session:** Theory- 15 Hours
- **Credits:** 1
(1 Credit for 15 Theory Hrs)
- **Course Coordinator/Instructor:**
- **Eligibility:** Programming knowledge of .NET Technology
- **Intake:** Min: (10) Max.: (15)
- **Course offered during :** Odd Semester
- **Course Fee:** Rs. 3000/-
- **Course Contents :**

UNIT I:

15 Hours

Introduction to Silverlight:

The Evolution of the User Interface, What is Silverlight, benefit of Silverlight, Silverlight development environment.**Layout Management in Silverlight:** Stack Panel Control, grid control, Nesting a Grid and Spanning a Column, The WrapPanel Control, The DockPanel Control.**Silverlight Controls:** Nesting Controls within Controls, Handling Events in Silverlight, User Input Controls, Extended Controls.**Data Binding and Silverlight List Controls:** Data binding, data grid control, List box control.

- **Text Books/Reference Books:**
 1. Beginning Silverlight 5 in C# - Robert Lair
 2. Pro Silverlight 5 in C# - Matthew MacDonald

**Department of Computer Science,
Shivaji University, Kolhapur
A Course under Choice Based Credit System (CBCS)**

- **Course code:** CSA01
- **Title of the course:** Advanced C Programming
- **Department at which course will be conducted:** Computer Science
- **Duration:** 4 weeks
- **Contact Session:** Theory- 15 Hours and Practical 12 Hours
- **Credits:** 2
(1 Credit for 15 Theory Hrs and 1 Credit for 12 Practical Hrs)

- **Course Coordinator/Instructor:**
- **Eligibility:** Basic Knowledge of C
- **Intake:** Min: (10) Max.: (15)
- **Course offered during:** Even semester
- **Course Fee:** Rs 3000/-
- **Course Contents:**

Unit-I :

(15)

Arrays : Declaration, initialization, Types – one, two and multidimensional, Passing arrays to functions, **Strings :**Declaration and initialization, Standard library functions.

Pointers : Declaration, initialization, Pointer arithmetic.

Structures and Unions: Creating structures, Accessing structure members (dot Operator), Array of structures, Unions, Difference between structures and unions.

File Handling: Types of Files, Operations on files, Random access to files.

Practical: (12)

Creating arrays, String initialization, Standard library functions, creating structures, Operations on files

- **Text Books/Reference Books:**
 1. Yashwant Kanetkar : Let Us C
 2. Kernighan and Ritchie : The C Programming language
 3. Herbert Schildt : Complete C Reference

Department of Computer Science,
Shivaji University, Kolhapur
Add-on Course under CBCS

- **Course code:** CSA02
- **Title of the course :** Advanced C++ Programming
- **Department at which course will be conducted :** Computer Science
- **Duration:** 4 weeks
- **Contact Session:** Theory- 15 Hours and Practical -12Hours
- **Credits:** 2
(1 credit for 15 Theory hrs. and 1 credit for 12 Practical hrs. per week)
- **Course Coordinator/Instructor:**
- **Eligibility:** Any Graduate with knowledge of Fundamentals of C++ language.
- **Intake:** Min: (10) max.: (15)
- **Course offered during :** Even semester
- **Course Fee:** Rs 4000
- **Course Contents:**

UNIT-I

Inheritance: Defining a class hierarchy, Base and Derived class constructor, types of Inheritance, Object slicing.

Polymorphism: early and late binding, Virtual Base Class.

Exception handling basics: basics of C++ exceptions.

UNIT-III

Practical Work: Defining Class hierarchy , Virtual base classes, catching an exception.

Practical Assignment:

11. Write a program to show single inheritance.
12. Write a program to implement multilevel inheritance to demonstrate base and derived class constructor.
13. Write a program to implement a class 'Complex' of complex numbers.

- The class should include the member functions to add and multiply two complex numbers.
14. Write a program to implement a string class. Overload + operator to concatenate two strings.
 15. Write a program to demonstrate use of virtual functions.

- **Text Books/Reference Books:**

- 1.C++ Primer – Lippman
- 2.C++ How to program – Deitel & Deitel (Pearson Education)
3. A.L.Stevens - " C++ database development"
4. Mastering C++ - K.R.VenuGopal, Rajkumar, T. RaniShankar (TMG)
5. Effective C++ - Scott Meyers (Pearson Education)
6. Object Oriented Programming in C++ - R. Subburaj (Vikas Publication)
7. Rambaugh et.al. - " Object Oriented Modeling and Designing"
9. Grady Booch -"Object Orient Analysis and Design with applications"
10. Bjarne Stroustrup - "The C++ programming language"(Addison Wesley)

Shivaji University, Kolhapur

Add-on Course under CBCS

- **Course code:** CSA03
- **Title of the course :** Advanced Java Programming
- **Department at which course will be conducted :**Computer Science
- **Duration:** 4 weeks
- **Contact Session:** Theory- **15 Hours** and Practical: 12 hours
- **Credits:** 2
(1 credit for 15 Theory hrs. and 1 credit for 12 Practical hrs. per week)
- **Course Coordinator/Instructor**
- **Eligibility:** Science graduate: basic knowledge of Java
- **Intake:**15 Min: (**10**) max.: (**15**)
- **Course offered during :** Even / Odd semester
- **Course Fee:** Rs. 4,000/-
- **Course Contents:**

Unit-I

(8 hrs)

Introduction: Introduction to JAVA, JVM, Swing, JDBC overview, Architecture, Java Servlet: Servlet life Cycle, Servlet Basics, JSP: Introduction to JSP, Architecture of JSP, Use of JSP.

Advanced Concepts: Java Beans: Creating and Designing JavaBean, using properties of Beans, Java Networking: RMI, Remote Method introduction, RMI architecture,

Unit-II

(7 hrs)

Layout Managers: FlowLayout, BorderLayout, GridLayout, CardLayout, GridBagLayout. JDBC Connection, A Simple Servlet Programs, Simple JSP Programs. RMI: Creating stub, Creating skeleton, using interface .

Practical Assignments

1. Develop a class to design a FlowLayout
2. Develop a class to design a GridLayout
3. Develop a class to design a CardLayout
4. Develop a class to design a BorderLayout
5. Develop a class to design a GridBagLayout
6. Creating a JDBC connection which is connect to any class in java.
7. Develop a Servlet for prime number.
8. Develop a java applications which are creates skeleton and stub objects for RMI
9. Develop a Servlet in package and execute it on Tomcat Server
10. Develop the page that uses expression , directives and script let.
11. Design a webpage to display Hit Counter or Access Counter.

Books/References

- 1) Learning Java- Rich Raposa-Willey, dreamTech Publication
- 2) The complete Reference Java- 5th edition – Herbert Schildt- Tata McGraw Hill

**Department of Computer Science,
Shivaji University, Kolhapur
A Course under Choice Based Credit System (CBCS)**

- **Course code:** CSA04
- **Title of the course:** Dot Net Programming
- **Department at which course will be conducted :** Computer Science
- **Duration:** 4 weeks

- **Contact Session:** Theory: 15 Hours and Practical : 12 Hours

- **Credits:** 2
(1 Credit for 15 Theory Hrs and 1 Credit for 12 Practical Hrs)

- **Course Coordinator/Instructor:**

- **Eligibility:** Programing knowledge of C.

- **Intake:** Min: (10) Max.: (15)

- **Course offered during :** Even semester

- **Course Fee:** Rs. 4000/-

- **Course Contents :**

UNIT I:

15 Hours

.NET Framework, CLR, CLS, CTS, .NET framework class library, visual studio IDE, data types, operators, control statement, switch statement, loops. Array: one-dimensional array, multi-dimensional array, jagged array, Exception handling. ASP.NET Basics: page structure, TextBox, Label, Button, LinkButton, CheckBox, RadioButton, Panel, Dropdown List, ListBox, Calendar, Adrotator. Crating a website for database use: use of SqlClient Namespace, SqlConnection, SqlCommand, SqlDataReader, adding data with insert, removing data with delete. Validation controls: Where to validate, Client side validation, Types of validations, Rich data controls. ASP. NET AJAX Controls: What is AJAX, Partial page updates, Simple User Control AJAX Demonstration, TextCaseExtenderControl, HilightedHyperLink,

- **Text Books/Reference Books:**

3. The complete reference – Herbert Schildt
4. ASP.NET 3.5 BEGINERS GUIDE - William B. Sanders
5. Build your own ASP.NET 3.0 website using c# and VB – cristian darie and zal ruvalcaba
6. Pro ASP. NET 3.5 Server controls and AJAX components - Rob Cameron and Dale Michalk

**Department of Computer Science,
Shivaji University, Kolhapur
A course under Choice Based Credit System (CBCS)**

- **Course code:** CSA05
- **Title of the course :** Computer Networks
- **Department at which course will be conducted :** Computer Science
- **Duration:** 4 weeks
- **Contact Session:** Theory- 30 Hours
- **Credits:** 2
(1 credit for 15 Theory hrs. per week)
- **Course Coordinator/Instructor:**
- **Eligibility:** knowledge of C++/ Java language
- **Intake:** Min: (10) Max.: (15)
- **Course offered during :** Even Semester
- **Course Fee:** Rs. 3,000/-
- **Course Contents:**

Unit-I **(15 hrs)**

Network fundamentals of communication theory, Network Topologies. Asynchronous and synchronous Transmission. Transmission Media: Guided media - twisted-pair cable, coaxial cable, fiber-optic Cable. Unguided media (wireless) - radio waves, microwaves, infrared. Transmission Impairment - attenuation, distortion, noise. Connection-oriented and connectionless Services, Service primitives.

Unit-II **(15 hrs)**

Goals of layered protocols, network design problems, OSI model and it's all layer's services.

Token passing– Token ring, Token bus, Token passing (priority systems).

ANSI Fiber Distributed Data Interface (FDDI), **Switching** - Circuit, switching, Message Switching, Packet Switching.

Routing – characteristics, routing algorithms(strategies)- optimality principle, shortest path routing, flooding, distance vector routing, link-state routing, hierarchical routing, broadcast routing, multicast routing. Congestion control and its prevention policies.

Text Books/Reference Books:

1. Black C “Computer networks protocols, standards and Interface”, prentice hall of India, 1996
2. Stilling W, “Computer communication network” (4th Edition), prentice hall of India, 1993
3. Tanenbaum A.S. “Computer Network”, prentice hall of India, 1981
4. Internetworking with TCP/IP: Principles, Protocols and Architecture- Comer

**Department of Computer Science,
Shivaji University, Kolhapur
Add-on Course under CBCS**

- **Course code:** CSA06
- **Title of the course:** Tally
- **Department at which course will be conducted:** Computer Science
- **Duration:** 4 weeks
- **Contact Session:** Theory- 15 Hours and Practical 12 Hours
- **Credits:** 2
(1 Credit for 15 Theory Hrs and 1 Credit for 12 Practical Hrs)
- **Course Coordinator/Instructor:**
- **Eligibility:** Any graduate with computer knowledge
- **Intake:** Min: (10) Max.: (15)
- **Course offered during:** Even semester
- **Course Fee:** Rs 4000/-
- **Course Contents:**

Unit-I:

(15)

Introduction to Tally :

Introduction, Creation of Company, Introduction to Gateway of Tally, Menu, Company Info menu. Accounts Configuration & Classification : Features & Configuration options for company maintaining accounts, Planning about organization of Chart of Accounts, Group and Ledgers.

Practical: (12)

Balance Sheet, P& LAccount, Trial Balance using Talley.

- **Text Books/Reference Books:**

1. Implementing Tally 6.3 by A.K.Nadhani, K.K.Nadhani, BPB Pub.
2. Accounting by Tally (Illustrated) by L.B.Singh & V.P.Singh, Asian Pub.

Department of Computer Science,

**Shivaji University, Kolhapur
Add-on Course under CBCS**

- **Course code:** CSA07
- **Title of the course :** Hadoop
- **Department at which course will be conducted :** Computer Science
- **Duration:** 2 weeks
- **Contact Session:** Theory- 15 Hours
- **Credits:** 1
(1 credit for 15 Theory hrs.)
- **Course Coordinator/Instructor:**
- **Eligibility:** Knowledge of Unix, Distributed Computing, Cloud Computing, Networking.
- **Intake:** Min: (10) max.: (15)
- **Course offered during :** Even semester
- **Course Fee:** Rs 3000/-
- **Course Contents:**

UNIT-I

Introduction of Hadoop, History, Comparison between Cloud Computing, Distributed Computing and Grid Computing, Architecture of Hadoop Distributed File System, Goals of HDFS, Data Flow in Hadoop Cloud, Hive- Data Warehouse.

- **Text Books/Reference Books:**
 1. Hadoop: The Definite Guide-Tom White
 2. Hadoop In Practice- Alex Holmes
 3. Understanding Big Data- Ibm Paul Zikopoulos, Chris Eaton