

**Department of Computer Science
University of Peshawar**

UNDERGRADUATE CURRICULUM

BCS

Code: BCS351

Credit Hours: 3

Internet Programming

HTML(Hypertext Markup Language)

- a) Internet, Web and HTML Fundamentals
- b) What is HTML
- c) The World Wide Web and Web Servers
- d) Working of Web Browsers
- e) HTML's Role on the Web
- f) Way of launching the Web Site

Creating Static Web Pages with HTML

- a) Creating a Web page and entering Text
- b) Changing and Customizations
- c) Display Text in List
- d) Adding Graphics into Web Pages
- e) Hypertext and Creating Links
- f) Issuing Links with other HTML Tags

Advance HTML

- a) Tables, Forms, Images
- b) Frames
- c) Multimedia Objects

Java Script

- a) Data types
- b) Control Structures
- c) Object & Function
- d) Event Handling

VB Script

Introduction, Data Types, Syntax, Controls, etc.

Active Server Pages

Personal Home Page

Common Gateway Interface(CGI) Script

Database Connectivity

- a) Using ASP
- b) Using CGI
- c) Using PHP

Books:

1. Thomas A. Powell, *HTML The Complete Reference, 2nd Edition, McGraw Hill, 1999.*
2. Ann Navarro, Todd Stauffer, *HTML by Example, 1st Edition, Que Corp, 1999.*

3. *Andrew Wooldridge, Mike Morgan, Mona Everett, Scott J. Walter, Special Edition Using Java Script, Que Corp, 1997.*

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Artificial Intelligence

Basic Concepts: Intelligence, Artificial Intelligence, Branches of Artificial Intelligence.

Tools: Prolog language, LISP language, Introduction to Small Talk, Expert System Shells.

Techniques: Searching (Blind search, knowledge-directed search); Knowledge Representation (Logic, Rules, Semantic Networks, scripts).

Applications: Natural Language Processing, Expert System, Speech Processing, Computer Vision, Robotics, Neural Networks, Machine Learning.

Books:

1. *D. Partridge, Artificial Intelligence applications in the future of software engineering, International Edition, Halsted Press, 1986.*
2. *Elaine Rich, Kevin Knight, Artificial Intelligence, 2nd Edition, McGraw Hill 1990.*
3. *Steven L. Tanimoto, The Elements of Artificial Intelligence: An Introduction using LISP, W.H.Freeman and Company, New York, 1987.*
4. *G.A. Orban, H. H. Hagel, Artificial and Biological Vision Systems, Springer-Verlag, 1992.*

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Analysis of Algorithm

Introduction, Properties of algorithms, features of algorithms, factors influencing the performance of algorithms (not in control of the programmer), Analysis of Algorithms, classification of algorithms, computational complexity, Asymptotic Notations, usefulness and limitations of the Asymptotic notation, Basic Recurrences, Recurrence Solutions, Factors influencing the execution time of an algorithm, some examples to calculate the T(n) of algorithms (including examples from searching and sorting), implementation of algorithms, rules for implementation, empirical analysis, Introduction to Generation functions, system approach, algorithms and systems, dynamic programming, greedy algorithms, divide and conquer approach.

Books:

1. *Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Introduction to Algorithms, 2nd Edition, The MIT Press, 2001.*
2. *Robert Sedgewick, Philippe Flajolet, An Introduction to the Analysis of Algorithms, 1st Edition, Addison Wesley Publishing Company, 1995.*

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Cred Hrs: 4

Programming Language III

Introduction to Java

- a) Introduction, Data Types, Syntax etc.
- b) Writing Simple Java Console Application

Applets

- a) Introduction to AWT and Applets, Use of AWT components in Java Application
- b) Writing Simple Applets

Servlets

- a) Introduction to Servlets, Servlets Life Cycle
- b) Developing Basic Servlets
- c) Using doPost, doGet, Service according to HTML Form Methods
- d) SSI (Server Side Include)
- e) Session Management

Advanced Java

- a) Packages and Interface
- b) Exceptions

Java Class Libraries

- a) Threads
- b) Writing Java Application
- c) The Java Class Libraries

Books:

1. *Jamie Jaworski, Java Developer's Guide, Macmillan Computer Pub. 1996.*
2. *Dustin R. Callaway, Inside Servlets : Server-side Programming for Java Platform, 2nd Edition, Addison Wesley Publishing Company, 2001.*

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Cred Hrs: 3

Software Engineering-I**Introduction**

- a) The Evolving Role of Software
- b) Software: A Crisis on the horizon, Software Myths

The Process

- a) Software Engineering- A Layered Technology
- b) The Software Process. Software Process Models, The Linear Sequential Model
- c) The prototyping Model, The Red Model, Evolutionary Software Process Models

Project Management Concepts

The Management Spectrum, People, The Problem, The Process.

System Engineering

- a) Computer-Based System, the Modeling Engineering Hierarchy
- b) Information Engineering, Information Strategy planning, Business Area Analysis
- c) Product Engineering, Modeling The system Architecture
- d) System Modeling and Simulation, System Specification

Analysis Concepts and Principles

- a) Requirements analysis, Communication Techniques, Analysis Principle
- b) Software Prototyping, Specification Review

Analysis Modeling

- a) A Brief History, the Elements of the analysis Model, data Modeling
- b) Functional Modeling and information Flow, Behavioral Modeling
- c) The Mechanics of STRUCTURED Analysis, The Data Dictionary
- d) An Overview of Other Classical Analysis Methods

Design Concept and Principle

- a) The Design process, Design Principles, Design Concepts, Effective Modular Design
- b) Design Heuristics for Effective Modularity, the Design Model, Design Documentation

Design Methods

- a) Data Design, Architectural Design, The Architectural Design Process
- b) Transform Mapping, Transaction Mapping, Design Post Processing
- c) Architectural Design Optimization, interface Design, Human Computer Interface Design
- d) Interface Design Guidelines, Procedural Design

Software Testing Methods

- a) Software Testing Fundamental, test case Design, White Box
- b) Basic path testing, Control Structure Testing, Black Box Testing
- c) Testing for Specialised Environments
- d) Strategies approaches to software testing and strategic issues
- e) Unit testing and Integrating testing.

Books:

Roger Pressman, Software Engineering, 6th Edition, McGraw Hill, 1997.

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Network Strategies

Switching circuit and packet switching

- a) switching networks, circuit-switching networks, switching concepts
- b) Routing in circuit in switched networks, control signaling
- c) Packet switching principles, routing , congestion control,X.25 protocols

Frame relay and asynchronous transfer mode (ATM) :

- a) beak ground ,frame relay protocol architecture frame relay ,call control
- b) user data transfer, network function ,congestion control,
- c) protocol architecture ,ATM logical connection ,ATM cells ,transmission of ATM cards
- d) ATM adaption layer , traffic and conjunction control
- e) ISDN and broad band ISDN , channels, user access ,isdn protocol, broad band protocol

Internetworking and network security:

- a) principles of internetworking connectionless and connection oriented internetworking
- b) the internet protocol ,routing protocol,IPv4,Ipv6(IPng),ICMPv6
- c) security requirements and attacks, privacy with conventional encryption message
- d) authentication and hash function ,public key encryption and digital signatures
- e) NetBIOS Names, NetBIOS background and names

Protocols and architecture:

- a) Internet protocol address resolution protocols(ARP)
- b) Internet control message protocol(ICMP)
- c) Internet group management protocol(IGMP)
- d) Border gateway protocol (BGP).
- e) Routing information protocol (RIP), Open shortest path first (OSPF),

Transport protocol

- a) Transport layer , transport services, protocol mechanisms
- b) Transmission control protocol, TCP header
- c) User data gram protocol, UDP header
- d) Ports and sockets

Network/Data Link Control protocol and Microsoft networking protocol suite:

- a) High level data link control protocols (HDLC), Serial Line Internet Control protocol (SLIP), Point –to-point protocol (PPP)
- b) Application /file System driver, Transport driver interface
- c) Protocol (TCP/IP, NW link, NetBEUI, AFP, DLC), network driver interface specification (NDIS)

Distributed application protocol:

- a) Abstract syntax notation one (ASN 1), network management –SNMPV2
- b) Electronic mail –SMTP and MIME

URL and URI

- a) Uniform resource locators (URL) and Universal resource identifiers (URI).

HTTP, FTP, TFTP:

- a) Hypertext transfer protocol(HTTP),Dynamic host configuration protocol (DHCP)
File transfer protocol(FTP),TFTP

Books:

1. *William Stallings, Data and Computer Communications, 5th Edition, Prentice Hall, 1994.*
2. *Andrew S. Tanenbaum, Computer Networks, 2nd Edition, Prentice Hall Inc, 1995.*