

## Chapter 1 Introduction to Computers and the Internet

- The Internet in Industry & Research
  - E-Commerce & Business
  - Mobile Computing and SmartPhone
  - Electronic Health Record
  - Cloud Computing
  - SmartGrid
  - Email, Instant Messaging, Video Chat, etc
- Evolution of the Internet & WWW
  - ARPANET
  - Packet switching
  - TCP/IP
  - World Wide Web, HTML, HTTP, HTTPs
- Web Basics
  - Hyperlinks
  - URIs, URLs, URNs
  - Web servers and clients
  - Making a Request and Receiving a Response
    - Get /books/downloads.html HTTP/1.1
    - Status of the transactions
      - HTTP/1.1 200 OK
      - HTTP/1.1 404 Not found
      - [www.w3.org/Protocols/rfc2616/rfc2616-sec10.html](http://www.w3.org/Protocols/rfc2616/rfc2616-sec10.html)
  - HTTP Headers
    - Content-type" text/html
    - MIME type (Multipurpose Internet Mail Extensions)
      - Image/jpeg
  - HTTP get and post Requests
    - Get (Client <= Server)
    - Post (Client => Server)
- Muirtier Application Architecture

- o Three-Tier Architecture
  - Client Tier (Browser) ⇔ Business Logic Tier (Web Server) ⇔ Data tier (Databases)
- Client-Side Scripting versus Server-side Scripting
- World Wide Web Consortium (W3C)
- Web 2.0, Search Engine, Social Media, Web Services, AJAX
- Social Applications
  - o Facebook
  - o Twitter
  - o Groupon
  - o Foursquare
  - o Skepe
  - o YouTube
- Data Hierarchy
- Operating Systems
- Mobile Operating Systems
- Types of Programming Languages
- Object Technology

## **Chapter 2 Introduction to HTML 5 (Part 1)**

- Components of HTML5
- Tools for creating HTML5 documents
- Add images
- Create and use hyperlinks
- Create tables
- Create and use forms to get user input

## Chapter 3 Introduction to HTML 5 (Parts1)

- New input types
  - Input type **color**
  - Input Type **date**
  - Input Type **datetime**
  - Input Type **datetime-local**
  - Input Type **email**
  - Input Type **month**
  - Input Type **number**
  - Input Type **range**
  - Input Type **tel** (Telephone)
  - Input Type **time**
  - Input Type **url**
  - Input Type **week**

## Chapter 4 Introduction to Cascading Style Sheets (CSS): Part 1

- Purposes
  - Control a website's appearance
  - Use style sheets to separate presentation from content
  - Use a style sheet to give all the pages of a website the same look and feel
  - Class attribute
  - Specify the Font, Size, Color, and other properties of displayed text
  - Specify element backgrounds and colors
- Types of Style Sheets
  - Inline Styles
  - Embedded Style Sheets
  - External Styles Sheets & Methods of Linking

## Chapter 5 Introduction to Cascading Style Sheets (CSS): Part 2 (Skipped)

- Advanced features

## Chapter 6 JavaScript: Introduction to Scripting

```
<!DOCTYPE html>
<html>
  <head>
    <meta charset = "utf-8">
    <title>
    <script type = "text/javascript">
    ...
    ...
    ...
    </script>
  </head>
  <body>
  ...
  </body>
</html>
```

- Document object
  - o Methods
    - document.writeln()
    - document.write()
- Window object
  - o Methods
    - document.writeln()
    - window.alert(), with OK button
    - window.prompt(), Prompt, Get user input, OK & Cancel buttons
- Other System wide methods
  - o parseInt()
- Javascript programming
  - o Arithmetic Operators
    - +, -, \*, /, %
  - o Decision Making and Related Operators
    - >, <, >= <=, ==, !=
    - If, else
  - o Adding integers example
    - Variables
    - Operators

## Chapter 7 JavaScript: Control Statements I

- `<script type = "text/javascript"> .... </script>`
- JavaScript Keywords (commonly used)
  - o `var`
  - o `if, else, true, false`
  - o `for, do, while`
  - o `switch, case, break, continue, default`
- Conditional Operator
  - o `(? : )`
- Assignment Operators
  - o `+=, -=, *=, /=, %=`
- Increment and Decrement Operators
  - o `++ (++a, Pre-increment); (a++, Post-increment)`
  - o `-- (--a, Pre-decrement); (a--, Post-decrement)`
- Nested if, else
- Repetition Statements
  - o `while`

## Chapter 8 JavaScript: Control Statements II

- Counter-Controlled Repetition
  - o `while Loop`
  - o `for loop`
- do-while Repetition
- Switch Multiple-Selection
  - o `switch()`
    - `case`
    - `break`
    - `default`
- `continue, break`
- Logical Operators
  - o `&& (AND), || (OR), ! (NOT)`
  - o `>, >=, <, <=`
  - o `==, !=`
- Conditional Operator
  - o `?:`

## Chapter 9 JavaScript: Functions

- Program Modules
- Function Definitions
- User Defined Function
  - Scope Rules
    - Global variables (script-level)
    - Local variables (function-level)
- JavaScript System Support Objects/Functions

## Chapter 10 JavaScript: Arrays

- Arrays
  - Declaring and Allocating Array Objects
    - `var c = new Array(100);`
  - Zeroth element
  - length property
- Passing Arrays to Functions
- Sorting Arrays
- Searching Arrays
- Multi-Dimensional Arrays

## Chapter 11 JavaScript: Objects

- Math Objects
  - Methods
    - `Math.sqrt()`, `Math.pow()`, `Math.exp()`, `Mth.log()`
    - `Math.abs()`, `Math.min()`, `Math.max()`, `Math.round()`, `Math.ceil()`
    - `Math.cos()`, `Math.sin()`, `Math.tan()`
  - Properties
    - `Math.E`, `MART.SQRT2`, `Math.LN2`, `Math.LN10`, etc
- String Object
  - `charAt()`
  - `concat()`
  - `split()`
  - `substring()`
  - `toLowerCase()`, `toUpperCase()`
  - etc

- Date Object
  - o getDate()
  - o getDay()
  - o getFullYear()
  - o getHours()
  - o getMinutes()
  - o getMonth()
  - o getSeconds()
  - o getTime()
  - o etc
- Boolean and Number Objects
  - o toString(radix)
  - o valueOf()
  - o etc
- Document Object
  - o getElementById(id)
  - o getElementsByTagName(tagName)
- localStorage and sessionStorage

## **Chapter 12 Document Object Model (DOM): Objects and Collection**

- DOM Nodes and Trees
- DOM Collections
  - o images collection
  - o link collection
  - o forms collection
  - o anchors collection
- Dynamic Styles and Animated Effects
  - o window.setInterval()
  - o window.clearInterval()

## **Chapter 13 JavaScript Event Handling**

- load event
  - o onload
- mousemove event
  - o mouseover

- o mouseout
- Form processing with focus and blur events

## Chapter 15 XML

- XML Basic
  - o Elements
  - o Vocabularies
  - o Viewing and Modifying XML Documents
  - o Processing XML documents
  - o Validating XML documents
- Structuring Data
  - o XML declaration
  - o Root nodes and XML prolog
  - o XML Element Names
  - o Viewing an XML Document in a Web Browser
- Application Examples
  - o A Business Letter
  - o XML document
  - o DTD(Data Type Definition) file
- XML Namespaces
  - o xmlns attribute
  - o unique URIs
  - o Namespace Prefix
  - o Namespaces in CML vocabularies
- Data Type Definition (DTD)
  - o !Element
  - o !ATTLIST
  - o CDATA, #PCDATA
  - o #REQUIRED, #IMPLIED, #FIXED, EMPTY
- W3C XML Schema Documents
  - o Defining an element in XML schema
    - string, Boolean, decimal, float, double, long, int, short, date, time, ...
- MathML

## Chapter 16 Ajax-Enables Rich Internet Applications with XML and JSON

- Ajax Application vs Traditional Web Application
  - o Asynchronous
  - o Callback function
- AJAX Technologies
  - o HTML
  - o JavaScript
  - o CSS
  - o DOM
  - o XML
- XMLHttpRequest object
  - o Asynchronous Requests
    - addEventListener()
    - open()
    - send()
    - setRequestHeader()
    - getResponseHeader()
    - getAllResponseHeaders()
    - abort()
  - o Properties
    - Readystatechange
    - readyState
    - responseText
    - responseXML
    - status
    - statusText
- Exception Handling
  - o try
  - o catch

## Chapter 18 Database: SQL, MySQL, LINQ and Java DB

- Relational Databases
- Tables
  - o Rows, columns

- o Primary key
  - o Foreign keys
- A Books Database Example
  - o Author table
  - o AuthorISBN table
  - o Titles table
- Entity-Relationship (ER) Diagram
  - o One-to-many
  - o Many-to-one
  - o Many-to-Many
- SQL keywords
  - o SELECT, FROM, WHERE, GROUP BY, ORDER BY, INNER JOIN, INSERT, UPDATE, DELETE
- SQL Examples