

## **IT1305 : Web Application Development I (Compulsory)**

### **INTRODUCTION**

This is one of four compulsory modules designed for Semester 1 of the Bachelor of Information Technology Degree programme. This module on web application development provides an introduction to the basic concepts, methods and tools needed to develop basic web sites.

### **CREDITS: 04**

### **LEARNING OUTCOMES**

After successful completion of this module students will be able to:

- Describe the fundamental concepts of the Internet and the World Wide Web
- Employ HTML and CSS to create web pages
- Employ client-side programming using JavaScript to add interactivity to web pages
- Describe and employ the fundamental concepts of XML

### **ONLINE LEARNING MATERIALS AND ACTIVITIES**

You can access all learning materials and this syllabus in the VLE: <http://vle.bit.lk>, if you are a registered student of the BIT degree programme. It is important to participate in learning activities provided in the VLE to learn this subject.

### **ONLINE ASSIGNMENTS**

The assignments consist of two quizzes; assignment quiz 1 (covers the first half of the syllabus) and assignment quiz 2 (covers the second half of the syllabus). The maximum marks for a question is 10, while the minimum mark for a question is 0 (irrespective of negative scores). Final mark is calculated considering 40% of assignment quiz 1 and 60% of assignment quiz 2. The pass mark of the online assignment in a course is 50%. You are advised to do online assignments before the final examination of the course. It is compulsory to pass all online assignments to partially qualify to obtain the year 1 certificate.

### **FINAL EXAMINATION**

Final exam of the course will be held at the end of the semester. Each course in the semester 1 is evaluated using a two-hour question paper that consists of 40-60 Multiple Choice Questions.

### OUTLINE OF SYLLABUS

Topic	Hours
1. Introduction to the Internet and Word Wide Web	7
2. Fundamentals of Hyper Text Markup Language (HTML)	12
3. Cascading Style Sheets (CSS)	7
4. Client-side programming using JavaScript	12
5. Fundamentals of Extensible Markup Language (XML)	7
<b>TOTAL</b>	<b>45</b>

### REQUIRED MATERIALS

#### Main Reading

Ref 1: HTML5: Black Book, Kogent Learning Solutions Inc., 2011

Ref 2: <http://en.wikipedia.org/wiki/Internet>

Ref 3: [http://en.wikipedia.org/wiki/Internet\\_protocol\\_suite](http://en.wikipedia.org/wiki/Internet_protocol_suite)

Ref 4: <http://en.wikipedia.org/wiki/Routing>

Ref 5: [https://en.wikipedia.org/wiki/Distributed\\_computing](https://en.wikipedia.org/wiki/Distributed_computing)

Ref 6: [http://en.wikipedia.org/wiki/Cloud\\_computing](http://en.wikipedia.org/wiki/Cloud_computing)

Ref 7: [http://en.wikipedia.org/wiki/World\\_Wide\\_Web](http://en.wikipedia.org/wiki/World_Wide_Web)

Ref 8: [http://en.wikipedia.org/wiki/Ip\\_address](http://en.wikipedia.org/wiki/Ip_address)

Ref 9: [http://en.wikipedia.org/wiki/Domain\\_name](http://en.wikipedia.org/wiki/Domain_name)

Ref 10: [www.w3schools.com/jsref/dom\\_obj\\_style.asp](http://www.w3schools.com/jsref/dom_obj_style.asp)

Ref 11: [www.w3schools.com/js/js\\_html\\_dom\\_css.asp](http://www.w3schools.com/js/js_html_dom_css.asp)

Ref 12: [www.w3schools.com/xml/xml\\_dtd.asp](http://www.w3schools.com/xml/xml_dtd.asp)

Ref 13: [http://en.wikipedia.org/wiki/Well-formed\\_document](http://en.wikipedia.org/wiki/Well-formed_document)

Ref 14: [http://www.w3schools.com/xml/xml\\_display.asp](http://www.w3schools.com/xml/xml_display.asp)

Ref 15: [http://www.w3schools.com/html/html\\_blocks.asp](http://www.w3schools.com/html/html_blocks.asp)

Ref 16: Web Application Architecture, Leon Shklar & Rich Rosen, John Wiley & Sons, Ltd 2003.

### DETAILED SYLLABUS

## 1. Introduction to the Internet and World Wide Web (7 hrs.)

### Instructional Objectives

- Explain what is referred to as the Internet.
- List and describe different technologies and services of the Internet
- Describe the World Wide Web.
- Describe various aspects of the World Wide Web and how it works.
- Explain how the HTTP protocol works.

### Material/Sub Topics

- 1.1 What is the Internet? [Ref 2]
  - 1.1.1 Introduction to protocols and routing [Ref 3, Ref 4]
  - 1.1.2 Some service on the Internet [Ref 2]
    - 1.1.2.1 WWW
    - 1.1.2.2 Data transfer
    - 1.1.2.3 Communication
    - 1.1.2.4 Distributed and Cloud Computing
  - 1.1.3 Social aspects of the Internet [Ref 2]
    - 1.1.3.1 Social Networking
    - 1.1.3.2 e-Learning
    - 1.1.3.3 e-Commerce
    - 1.1.3.4 e-Governance
    - 1.1.3.5 Telecommuting
    - 1.1.3.6 Politics and Activism
    - 1.1.3.7 Censorship
- 1.2 What is the World Wide Web? [Ref 7]
- 1.3 How the Web works?
  - 1.3.1 Web application architecture [Ref 16: pg. 201-205]
  - 1.3.2 IP addresses and Domain Names [Ref 8, Ref 9]
  - 1.3.3 URL and URI [Ref 16: pg. 30-33]
  - 1.3.4 The HTTP protocol and how it works [Ref 16: pg. 32-42]

## 2. Fundamentals of Hyper Text Markup Language 5 (12 hrs.)

### Instructional Objectives

- Describe the structure of and HTML document
- Explain different Content models
- Describe what a doctypes with reference to the HTML 5 doctype
- Explain the advantages of XHTML over HTML
- Employ HTML elements to create a website with form functionality and embedded multimedia

### Material/Sub Topics

- 2.1 Document Object Model [Ref 1: pg. 406 - 424]
- 2.2 Basic Structure of an (X)HTML document [Ref 1: pg. 20 -23]
- 2.3 Content models: Blocks and inline elements [Ref 15]
- 2.4 Basic HTML elements [Ref 1: pg. 32 – 188]
- 2.5 Doctypes, and the HTML 5 doctype [Ref 1: pg. 23]
- 2.6 Advantages of XHTML [Ref 1: pg 5]
- 2.7 HTML forms [Ref 1: pg. 190 – 232]
  - 2.7.1 How forms work, GET and POST
  - 2.7.2 Form controls and attributes
  - 2.7.3 Form elements
  - 2.7.4 Various input types
- 2.8 Multimedia in HTML [Ref 1: pg. 246 – 264]

### **3. Cascading Style Sheets Version 3.0 (7 hrs.)**

#### **Instructional Objectives**

- Describe the basic concepts of CSS
- Explain what Cascading and Inheritance is in CSS
- Employ various elements of CSS in a website

#### **Material/Sub Topics**

- 3.1 Basics [Ref 1: pg. 466 – 474]
  - 3.1.1 Standards and rules
  - 3.1.2 Validation
  - 3.1.3 How to add CSS
  - 3.1.4 CSS selectors
  - 3.1.5 Classes and Ids
  - 3.1.6 Attribute selectors
  - 3.1.7 Pseudo classes and elements
  - 3.1.8 Combinators
  - 3.1.9 Selector grouping
- 3.2 Cascading and Inheritance [Ref 1: pg. 475]
- 3.3 Properties and Values [Ref 1: Chapters 19, 20, 21, 22, 24]
- 3.4 Fonts, colours and backgrounds [Ref 1: Chapters 19, 20, 21, 22, 24]
- 3.5 Box Model [Ref 1: pg. 546 – 653]
- 3.6 Positioning [Ref 1: pg. 562]
- 3.7 Table layouts [Ref 1: pg. 636 – 652]

### **4. Client-side programming using JavaScript (12 hrs.)**

#### **Instructional Objectives**

- Describe the basic syntax, variables, operators and primitives in JavaScript
- Explain event handling in JavaScript
- Employ JavaScript in combination with CSS

- Develop a website employing HTML, CSS and JavaScript

### **Material/Sub Topics**

- 4.1 Adding JavaScript to a document [Ref 1: pg. 266 – 268, 285 – 287]
- 4.2 Basic syntax rules [Ref 1: pg. 269 – 274, 284, 301 – 304, 388 - 390]
- 4.3 Variables [Ref 1: pg. 275, 278]
- 4.4 Operators & Control Flow statements [Ref 1: pg. 275 – 281, 290-294]
- 4.5 Primitives [Ref 1: pg. 271- 273 (Literals)]
- 4.6 Function and Events [Ref 1: pg. 306 – 309, 310 – 313]
- 4.7 JavaScript & CSS [Ref 10, Ref 11]

## **5. Fundamentals of XML (7 hrs.)**

### **Instructional Objectives**

- Describe the basic concepts behind XML
- Employ CSS and XSL to format XML documents
- Explain different XML Document APIs

### **Material/Sub Topics**

- 5.1 Basic XML [Ref 1: pg. 762 – 768]
  - 5.1.1 Well-formedness & Validity [Ref 12, Ref 13]
  - 5.1.2 DTDs and Schemas [Ref 1: pg. 769 – 774]
  - 5.1.3 Namespace and RDF [Ref 1: pg. 788 – 802, 805 – 807]
  - 5.1.4 Introduction to XPath, XPointer and XLink [Ref 1: pg. 808 – 887]
- 5.2 Formatting XML documents
  - 5.2.1 CSS [Ref 14]
  - 5.2.2 XSL [Ref 1: pg. 844 – 878]
- 5.3 XML Document APIs
  - 5.3.1 DOM [Ref 1: pg. 820, 829 – 831]
  - 5.3.2 SAX [Ref 1: pg. 821, 831 – 835]