

IT5403 Internet Application Development (Optional)

INTRODUCTION

This is one of the optional courses designed for Semester 5 of the Bachelor of Information Technology Degree program. This course on Internet Application Development focuses on building web applications using latest Internet Application Development technologies.

CREDITS: 04

LEARNING OUTCOMES

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

- Write server-side scripts to communicate with a web server
- Demonstrate the fundamental Web Application Architecture including Web Services
- Explain core XML concepts including DTD, Schema, Namespaces and XSL
- Develop XML applications by programming the SAX and DOM API's
- Explain the Web Services Technology stack and how each component relates to the other
- Build, compose, document, publish and consume Web Services
- Explain the basic security issues and implementation issues in Web Services

OUTLINE OF SYLLABUS

Topic	Hours
1- Web Applications Architecture	02
2- Introduction to Web Programming	04*
3- XML Fundamentals	22*
4- Processing XML Documents	10*
5- Web Services	22*
Total for the subject	60

** Students may need more time to do relevant practical work.*

SYNOPSIS/OVERVIEW

This course introduces the concepts and technologies of Internet Application Development, and provides the learner with most essential application development skills needed in developing Internet Applications.

PEDAGOGICAL FRAMEWORK

The main pedagogical framework of the course focuses on activity based learning. Students are expected to complete all the learning activities to cover the learning content.

EXPECTATIONS/EXAMINATIONS/REQUIREMENTS

The learners are expected to obtain knowledge on the concepts in Internet Application Development and master necessary skills to work with tools and technologies related to Internet Application Development. Learning activities and tutorials exercises are very important in this course, and they will help students to prepare themselves for the final semester exam. Final exam is a two hour structured written paper. [The question paper will clearly reflect the number of hours allocated for each section.](#)

REQUIRED MATERIALS**Main Reading**

Ref 1: Dave W.Mercer et. al. (2004). Beginning PHP5. Wiley

Ref 2: Michael Morrison (2006). Sams Teach Yourself XML in 24 Hours (3rd Edition). Pearson Education.

Ref 3: James Fuller et. al. (2003). Professional PHP Web Services. Wrox Press.

DETAILED SYLLABUS:

Section 1 : Web Applications Architecture (02 hrs)

Instructional Objectives

- Describe the Client-Server, N-Tier and P2P architectures of Web Applications
- Identify the need for and role of middleware in Web Applications
- Explain the need for the various components (Network/Transport, Messaging, Description, Discovery) of the Web Services Stack

Material /Sub Topics

- 1.1. Component-Based Development [Ref 3: pg 10]
- 1.2. Distributed Computing: Client-Server, N-Tier and P2P Architectures [Ref 3: pg 10-16]
- 1.3. Distributed Application Technologies: Platform-Specific Technologies, CORBA, DCOM, EJB [Ref 3: pg 16-19]
- 1.4. What are Web Services? [Ref 3: pg 21, 22]

Section 2 : Introduction to Web Programming (04 hrs)

Instructional Objectives

- Configure and run the Apache web server on Windows or Linux platforms
- Install and connect PHP to Apache server
- Revise basic syntax of PHP
- Describe the Web related features of PHP

Material /Sub Topics

- 2.1. PHP Installation and Apache Configuration [Ref 1: pg 2]
- 2.2. PHP: Revision (Syntax, Operators, Arrays,...) [Ref 1: pg 31-33, 41, 46, 62, 161]

Section 3 : XML Fundamentals (22 hrs)**Instructional Objectives**

- Explain the overall XML framework and how it relates to existing Web technology including (X)HTML
- Identify the distinction between presentation and content on the web and how it can be addressed using XML
- Explain the distinctions between Well-formedness and Validity, DTD's and Schema, XPointer and XLink
- Use style sheet technology and the XSL
- Discuss how XML document structure can be accessed using the SAX and DOM API's

Material /Sub Topics

- 3.1. Basic XML [Ref 2: pg 8-17,21-29, 32-38, 72-87]
 - 3.1.1. Well-formedness & Validity [Ref 2: pg 50]
 - 3.1.2. DTD's and Schema [Ref 2: pg 44-67, 130-155, 157-167]
 - 3.1.3. Namespaces and RDF [Ref 2: pg 89-98, 16, 521, 500-513]
 - 3.1.4. Introduction to XPath, XPointer, XLink [Ref 2: pg 439-467]
- 3.2. Formatting XML Documents [Ref 2: pg 173-186]
 - 3.2.1. Cascading Style Sheets [Ref 2: pg 189-220]
 - 3.2.2. XSL: XSLT & XSLFO [Ref 2: pg 223-241, 245-267, 287-302]
- 3.3. XML Document API's
 - 3.3.1. DOM: Document Object Model [Ref 2: pg 329-336]
 - 3.3.2. SAX: A Simple API for XML [Ref 2: pg 349-354]
- 3.4. XQuery [Ref 2: pg 367-380]
- 3.5. Using XML with Databases [Ref 2: pg 390-398]

Section 4 : Processing XML Documents (10 hrs)**Instructional Objectives**

- Manipulate XML document content using PHP SAX and DOM API's

Material /Sub Topics

- 4.1. Handling SAX with PHP [Refer Teachers Note]
- 4.2. Handling DOM with PHP [Refer Teachers Note]

Section 5 : Web Services (22 hrs)**Instructional Objectives**

- Describe the role of XML-RPC and SOAP in Messaging
- Use Web Services offered by third parties using XML-RPC and SOAP extensions in PHP
- Use of PHP's NuSOAP library
- Identify security issues in web services including file system access control, signature, encryption
- Describe Web Services using WSDL
- Explain the discovery mechanism for Web Services using UDDI

Material /Sub Topics

- 5.1. Web Services Architecture and Technology Stack [Ref 3: pg 21-40, 46, 91]
- 5.2. HTTP [Ref 3: pg 63-78]
- 5.3. Messaging with XML-RPC
 - 5.3.1. XML-RPC Basics [Ref 3: pg 93-112, 137-138]
- 5.4. Messaging with SOAP [Ref 3: pg 193-194, 236]
 - 5.4.1. SOAP Basics [Ref 3: pg 141-162]
 - 5.4.2. SOAP Data Encoding [Ref 3: pg 162-179]
 - 5.4.3. SOAP Transport Bindings [Ref 3: pg 179-182]
 - 5.4.4. SOAP Intermediaries [Ref 3: pg 182-186]
 - 5.4.5. SOAP with PHP: NuSOAP [Ref 3: pg 198-206, 212-221, 230-232]
- 5.5. Basic Web Services Security: XML Signature and Encryption [Ref 3: pg 239, 243-252, 269-271, 285, 294-295]

- 5.6. Describing Web Services with WSDL [Ref 3: pg 297-328, 344]
- 5.7. Discovery of Web Services with UDDI [Ref 3: pg 347-354]

PLATFORM

- Windows or Linux
- A XML editor of your choice
- PHP including NuSOAP

Activities -

Please refer to the activities on the e-learning material in your Learning Management System (LMS).

Assessment -

Final exam is a two hour paper which consists of 4 structured questions. [The question paper will clearly reflect the number of hours allocated for each section.](#) More details about the paper will be given in the Learning Management System (LMS) in due course.

Contact details -

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