

**Title (Units):** COMP4037 E-Technology Architectures, Tools and Applications (3,2,1)

**Course Aims:** To develop students' understanding of recent developments in e-technologies, including XML, Web services, service-oriented architecture, Web-enabled business processes, as well as related architectures, tools, and applications. To develop students' capability to design and develop software systems based on e-technologies and to apply them to some application domains.

**Prerequisite:** COMP2045 Programming and Problem Solving OR  
COMP3015 Data Communications and Networking

**Course Intended Learning Outcomes (CILOs):**

Upon successful completion of this course, students should be able to:

No.	Course Intended Learning Outcomes (CILOs)
	<b>Knowledge</b>
1	Explain standards and protocols such as XML, WSDL, SOAP and UDDI that are used to develop web services
2	Explain service oriented architecture and how web services can be used in system development and management
3	Explain web-based business process and its enabling tools and technologies
	<b>Professional Skill</b>
4	Produce requirements and specifications in the context of web services
5	Design and develop web service systems
	<b>Attitude</b>
6	Reflect that web technologies are continuously evolving and that their impacts on information systems and business process are also continuously evolving

**Calendar Description:** This course will develop students' understanding of recent developments in e-technologies, including XML, Web services, service-oriented architecture, Web-enabled business processes, as well as related architectures, tools, and applications. It will also enable students to acquire the capability to design and develop software systems based on e-technologies and to apply them to some domain applications.

**Teaching and Learning Activities (TLAs):**

CILOs	Type of TLA
1-6	Students will learn the web technology concepts via lectures and assignments.
4-5	Students will acquire hand-on experience via laboratory sections, and/or development projects.

**Assessment:**

No.	Assessment Methods	Weighting	CILOs to be addressed	Description of Assessment Tasks
1	Continuous Assessment	40%	1-5	Continuous assessment in the forms of assignments, exercises, individual and/or group projects will be used to evaluate students understanding of the basics of e-technology and to assess students' ability to design and develop web service systems.
2	Examination	60%	1-4	Examination will be used to evaluate students' knowledge of standards and protocols that are used to develop web services, to test students' understanding of web services and web-based business process, and the enabling technologies of web services.

**Assessment Rubrics:**

<b>Criteria</b>	<b>Excellent (A)</b>	<b>Good (B)</b>	<b>Satisfactory (C)</b>	<b>Marginal Pass (D)</b>	<b>Fail (F)</b>
<b>Use XML and Web Services technologies for service oriented system development</b>	Compare, contrast and design XML related schema based on some requirement of an application so as to support some requested queries on it; Use web services to develop a more sizeable web system with both web services and a client side program to invoke them	Identify the XML related schema based on different xml data files and make queries on it; Use web services to develop a more sizeable web system with both web services and a client side program to invoke them	Identify the XML related schema based on different xml data files and make queries on it; Use web services to develop a simple web system with both web services and a client side program to invoke them	Identify the XML related schema based on a simple xml data file; Develop a simple web system to invoke some web services.	Unable to use XML and web services to develop a simple web system
<b>Describe the key standards, protocols and design principle of the related technologies -- indicating their purposes and interactions among them</b>	Describe the features of various key standards, protocols and design principle on XML schema, queries, Web Services and Web-based Business processes in the context of some applications and how they are related to the better management and strategic development of an enterprise	Describe the features of various key standards, protocols and design principle on XML schema, queries, Web Services and Web-based Business processes in the context of some applications.	Describe the features of various key standards, protocols and design principle on XML schema, queries, Web Services and Web-based Business processes	Identify the purpose of various key standards, protocols and design principle on XML schema, queries, Web Services and Web-based Business processes	Unable to clearly identify the purpose and general principle for the current design of XML and Web Services technologies

**Course Content and CILOs Mapping:**

<b>Content</b>	<b>CILO No.</b>
I Introduction to Emerging Web Technologies	6
II The World Wide Web and XML	1, 4, 5
III Web services	1, 2, 4, 5
IV Web-based Business Process	3, 4, 5
V Other Advanced Topics on Web Technologies	3, 6
VI E-technology Application Case Studies	2, 3, 4, 6

**References:**

- Robert Daigneau, Service Design Patterns: Fundamental Design Solutions for SOAP/WSDL and RESTful Web Services, Addison-Wesley Professional, 2011

- Martin Kalin, Java Web Services: Up and Running, O' Reilly, 2013
- Dino Esposito, Architecting Mobile Solutions for the Enterprise. Microsoft Press, 2012
- Anders Møller and Michael I. Schwartzbach, An Introduction to XML and Web Technologies, Addison-Wesley, 2006
- Technical reports, standard specification and project documentations published by the World Wide Web Consortium (W3C) at <http://www.w3.org>.
- Relevant research papers published in journals and conference proceedings

**Course Content:**

**Topic**

- I. Introduction to Emerging Web Technologies
  - A. Service oriented computing
  - B. Web 2.0
  - C. Others
  
- II. The World Wide Web and XML
  - A. The evolution of the web related languages
  - B. XML language
  - C. XML document processing and management: technologies and tools
  
- III. Web services
  - A. Service oriented computing and architecture
  - B. Web service related technologies, including WSDL, SOAP/REST and UDDI
  - C. Web service oriented system development and management
  
- IV. Web-based Business Process
  - A. Business process management
  - B. Web process modeling and BPEL
  - C. Web process management: technologies and tools
  
- V. Other Advanced Topics on Web Technologies
  
- VI. E-technology Application Case Studies