Knight Foundation School of Computing and Information Sciences

Course Title: Component-Based Software Development **Date:** 02/24/2015

Course Number: COP 4814

Number of Credits: 3

Subject Area: Programming	**Subject Area Coordinator:** Antonio Hernandez **email:** antherna@fiu.edu
Catalog Description: Integrating, exchanging, and transforming XML data, building software from components, understanding security concepts, basic Web services.	
Textbooks: XML: Visual QuickStart Guide (2/e) by Kevin Howard Goldberg; Head First Design Patterns, by Eric Freeman, et al.	
References:	
Prerequisites Courses: COP 4703 and CGS 4854	
Corequisites Courses:	

Type: Required for IT major

Prerequisites Topics:

- Familiarity with CSS styles and XHTML
- Knowledge of creating web applications
- Experience with simple data validation techniques
- Knowledge of object-oriented programming, including composition, inheritance, and interfaces

Course Outcomes:

1. Identify principles and techniques for integrating and exchanging data
2. Use XML/DOM to integrate and exchange data, and use XSL/XSLT to transform data.
3. Recognize simple design patterns commonly used when creating software components.
4. Use objects and standard collection classes to build software components related to common business applications.
5. Demonstrate the process of creating unit tests and show a basic understanding of code access security.
6. Demonstrate the basic functions of a software version control system.
7. Produce and consume a simple Web service application.

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Relationship between Course Outcomes and Program Outcomes

BS in IT: Program Outcomes	Course Outcomes
a) Demonstrate practical hands-on expertise in selection, installation, customizing and maintenance of the state-of-the-art computing infrastructure.	
b) Demonstrate practical proficiency in selection, installation, customizing and maintenance of the state-of-the-art software systems.	
c) Demonstrate general understanding of at least one field where Information Technology plays a central role.	1, 2, 3, 4, 5, 6, 7
d) Demonstrate understanding of the social and ethical concerns of the practice of Information Technology.	
e) Demonstrate the ability to work cooperatively in teams.	
f) Demonstrate effective communication skills.	
g) Demonstrate familiarity with fundamental ideas and issues in the arts, humanities and social sciences.	

Assessment Plan for the Course & how Data in the Course are used to assess Program Outcomes

Student and Instructor Course Outcome Surveys are administered at the conclusion of each offering, and are evaluated as described in the School's Assessment Plan: https://abet.cs.fiu.edu/csassessment/

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Outline

Topic	Number of Lecture Hours	Outcome
• Data Representation and encoding o ASCII, Unicode o Binary, Octal, Hexadecimal	2	1
• XML Documents o Metadata o XML namespaces o Document Type Definition (DTD) o Querying documents using XPath	5	2
• XML Translation o XML schemas o XSLT template-based transformation o XSL files o translating XML to XHTML o Selecting XML data with XPath	6	2
• Integrative Coding o Interfaces (review) o Java Lists and Maps o Strategy, observer, decorator, factory method design patterns	8	3,4
• Overview of Architectures for Integrating Systems o DCOM, CORBA, RMI	2	3
• Web Services Overview o Applications of Web services o SOAP, UDDI, WSDL o Consuming Web services	4	7
• Unit Testing o Unit testing concepts and motivation o Creating unit tests	3	5
• Security Concepts o evidence-based security o code access security o overview of best security practices o authentication to system resources and services	3	5
• Versioning and Version Control o need for versioning o basic version control functions	3	6

Total: 39 hours

Course Outcomes Emphasized in Laboratory Projects / Assignments

	Outcome	Number of Weeks
1	XML documents and translation Outcomes: 1, 2	4
2	Design patterns Outcomes: 3	3
3	Objects and Collection Classes Outcomes: 4	2
4	Web Services Outcomes: 3, 6	2
5	Unit Tests and Code access security Outcomes: 4	2
6	Versioning Outcomes: 5	1

Oral and Written Communication: No significant coverage

Written Reports		Oral Presentations
Approx. Number of pages	Number Required	Approx. Time for each
0	0	0

Social and Ethical Implications of Computing Topics

No significant coverage

Topic	Class time	Student performance measures

Estimate Curriculum Category Content (credit hours)

Fundamental IT Area	Core	Advanced
Human computer interaction		
Information management		
Web systems and technologies	1.0	
System administration and maintenance		
Programming	1.0	
Networking		
Information assurance and security	0.5	
System integration and architecture	0.5	

Theoretical Contents

No Significant Coverage

Problem Analysis Experiences

1. Analyze application requirements and determine need for data exchange and transformation

Solution Design Experiences

1. Using XML/DOM API to integrate and exchange data
2. Using XSL/XSLT API to transform data
3. Implementation of applications that consume Web services