Course Title: Web Application Programming  
Date: October 13, 2009

Course Number: COP 4813

Number of Credits: 3

Subject Area: Application Development  
Subject Area Coordinator: Kip Irvine  
email: irvinek@cs.fiu.edu

Catalog Description: Programming of server-side Web applications with databases, state management, security, error handling, and Web services.


References:

Prerequisites Courses: CGS 4825 and COP 4005

Corequisites Courses: None

Type: Elective

Prerequisites Topics:

- Master classes and objects in multitier applications
- Master structured exception handling and interactive error trapping
- Be familiar with data-bound controls and database application programming interface
- Master client/server communication
- Be familiar with use of CSS 1 style sheets

Course Outcomes:

1. Master creating Web applications
2. Master interfacing Web applications with multiuser databases
3. Master commonly used Web server controls
4. Be familiar with error handling and input validation in Web applications
5. Master maintaining state in Web applications.
6. Be exposed to creating and consuming Web services
7. Be exposed to client-side scripting languages
8. Be familiar with user authentication and authorization techniques
9. Be exposed to Web-based reports
# COP 4813

## Web Application Programming

<table>
<thead>
<tr>
<th>Topic</th>
<th>Number of Lecture Hours</th>
<th>Outcome</th>
</tr>
</thead>
</table>
| • Introduction to Web-based application architecture  
  o Concepts  
  o Client-server model  
  o Page state  
  o Multi-tier design | 3 | 1 |
| • Web server controls  
  o Text and buttons  
  o List-oriented  
  o Template-based | 9 | 1, 3 |
| • Designing Web interfaces  
  o Design principles  
  o Layout techniques  
  o Cascading style sheets  
  o XHTML basics | 6 | 3 |
| • Error Handling and Input Validation  
  o Guidelines and principles  
  o Web validation controls | 3 | 4 |
| • Client-side programming  
  o Scripting languages | 3 | 7 |
| • User authentication and authorization  
  o Principles  
  o Server controls  
  o Role-based authorization | 3 | 8 |
| • Maintaining State  
  o Page state  
  o Session state  
  o Persistent cookies | 3 | 5 |
| • Reading and updating databases  
  o Data-bound controls  
  o Database objects API  
  o Data components | 6 | 2 |
| • Web services  
  o Creating  
  o Consuming | 2 | 6 |
| • Web reports | 1 | 9 |
# Course Outcomes Emphasized in Laboratory Projects / Assignments

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Number of Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Creating Web applications with user controls, input validation, and maintaining state.</td>
<td>4</td>
</tr>
<tr>
<td>Outcomes: 1, 3, 4, 5</td>
<td></td>
</tr>
<tr>
<td>2. Web applications with databases, Web services, client-side scripting, user authentication and authorization</td>
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</tr>
<tr>
<td>Outcomes: 1, 2</td>
<td></td>
</tr>
<tr>
<td>3. Web services</td>
<td>1</td>
</tr>
<tr>
<td>Outcomes: 6</td>
<td></td>
</tr>
<tr>
<td>4. Web applications with client-side scripting, user authentication and authorization</td>
<td>3</td>
</tr>
<tr>
<td>Outcomes: 7, 8</td>
<td></td>
</tr>
<tr>
<td>5. Web applications with reports.</td>
<td>1</td>
</tr>
<tr>
<td>Outcome: 9</td>
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</tbody>
</table>
The Coverage of Knowledge Units within IEEE/ACM Computing Curricula Guidelines

<table>
<thead>
<tr>
<th>Knowledge Unit</th>
<th>Topic</th>
<th>Lecture Hours</th>
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<tbody>
<tr>
<td>PF5</td>
<td>Event-driven programming</td>
<td>4</td>
</tr>
<tr>
<td>NC4</td>
<td>The web as an example of client-server computing</td>
<td>2</td>
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<tr>
<td>NC5</td>
<td>Building web applications</td>
<td>12</td>
</tr>
<tr>
<td>NC1</td>
<td>Introduction to net-centric computing</td>
<td>1</td>
</tr>
<tr>
<td>HC2</td>
<td>Building a simple graphical user interface</td>
<td>2</td>
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<tr>
<td>HC5</td>
<td>Graphical user-interface design</td>
<td>6</td>
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<tr>
<td>HC6</td>
<td>Graphical user-interface programming</td>
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<tr>
<td>IM5</td>
<td>Database query languages</td>
<td>3</td>
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<tr>
<td>IM7</td>
<td>Transaction processing</td>
<td>1</td>
</tr>
<tr>
<td>SE9</td>
<td>Component-based computing</td>
<td>2</td>
</tr>
<tr>
<td>SE1</td>
<td>Software design</td>
<td>2</td>
</tr>
<tr>
<td>SE2</td>
<td>Using APIs</td>
<td>3</td>
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