Al Akhawayn University in Ifrane

School of Science and Engineering

A. Course

Course:	CSC 3327 – Internet Technologies	**Room**:	05//107
Term:	Fall 2012	**Class hours**:	MW 12:00-13:20
		Office Hours:	MTWR 15:30-17:30

B. Instructor

Name	: O.IRAQI	**Office**	: 7//113 or ITS
E-mail	: o.iraqi@aui.ma	**Phone**	: 24-14

C. Course Description

This course provides a solid background – both theoretical and practical – on designing, developing, deploying and administering secure and scalable enterprise-class applications, according to best practices and design patterns, and based on state of the art technologies, frameworks, APIs and languages:

- **Concepts:** Protocol, Client, Server, Framework, IoC (Injection of Control), Caching, etc.
- **Protocols:** DNS, HTTP, XML/SOAP
- **Languages:** HTML, XML, WSDL
- **APIs:** Socket, Servlet/JSP, JDBC, Log4J, etc.
- **Frameworks:** Struts, Spring, Hibernate and Cayenne
- **Models:** ORM (Object-Relational Mapping), AOP (Aspect Oriented Programming), SOA (Service Oriented Architecture)
- **Design Patterns:** MVC, Front Controller, Chain of Responsibility, DTO (Data Transfer Object), etc.
- **Technologies:** JEE, Web Services
- **Security:** Session hijacking, Eavesdropping, DoS, XSS, SQL injection, SSL, safe coding, etc.

D. Prerequisite

CSC 2302, CSC3326 and extensive programming in Java

E. Intended Learning Outcomes (ILOs)

This course enables students to achieve, by the end of the semester, the ability to:

1. master the client/server model and programming in Java

2. describe DNS and HTTP protocols and use it in client/server programming
3. describe web server administration tasks and understand related performance and security issues
4. use languages such as HTML and XML
5. master APIs such as Servlets/JSP, JDBC, Log4J and JNDI
6. design architectures such as client/server, distributed and multi-tier
7. use modern web frameworks such as Struts and Spring
8. use ORM, SOA, IoC and AOP
9. use technologies such as JEE
10. design, develop and administer enterprise class applications according to best practices and design patterns
11. describe related security risks and corresponding countermeasures

F. Mapping between Course ILOs and Program Outcomes

Course ILO	Program Outcome
1	9
2	9
3	9
4	9
5	9
6	11
7	9
8	9
9	2, 3, 9, 11

G. Tools

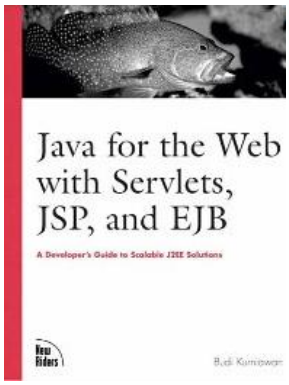
Apache Web Server

Tomcat Web Container

Borland JBuilder IDE

Eclipse IDE for Java EE Developers

H. Text Books



I. Course Content

Chapter 1: First Things First (2 weeks)

- What is a *Client*?
- What is a *Server*?
- What is a *Protocol*?
- Protocol design
- Client/Server-based development and socket programming

Chapter 2: Welcome to the Web! (2 weeks)

- The pillars: DNS, HTTP, HTML and XML
- Web proxying and load-balancing
- Web server administration
- Security: risks and countermeasures

Chapter 3: The Dynamic Web (4.5 weeks)

- Web application design and development: a container/framework approach
- The MVC paradigm and best web programming practices
- The Servlet/JSP container and API
- Struts framework
- Security: risks and countermeasures

Chapter 4: Persistence (2 weeks)

- Unified database access – DBMS independency
- ORM (Object-Relational Mapping)
- ORM frameworks: Hibernate and Cayenne
- Security: risks and countermeasures

Chapter 5: Remoting, Abstraction, Reusability and Scalability (2 weeks)

- Distributed computing
- SOA (Service Oriented Architecture)
- Security: risks and countermeasures

Chapter 6: Tying It All Together (3 weeks)

- Enterprise-class apps architecture and design: tiers and cross-cutting concerns
- IoC (Injection of Control) and AOP (Aspect Oriented Programming)
- JEE technology and Spring framework

J. Homework

- Will allow practicing covered topics and beyond
- Will be published on Jenzabar, timely

K. Assessment

Attendance & Participation: 10%

- Attendance: 50%
- Participation: 50%

Coursework: 90%

- Exams: 50%
  - Midterm (Date: last session before the midterm break): 40%
  - Final (Date: according to Enrollment Services): 60%
- Homework: 30%
  - Homework1: 30%
  - Homework2: 33%
  - Homework3: 37%
- Quizzes (~8 unannounced, weighted equally): 20%

☝ Think twice before missing an exam: the makeup shall be **much more difficult**

L. Resources

- HTTP Specification (RFC 2068)
- The Official Red Hat Linux Customization Guide
- Java 2 Platform, Standard Edition, v 1.4.0 API Specification
- JavaMail API specification
- Java 2 Platform, Enterprise Edition Specification, v 1.4
- Java Remote Method Invocation
- JDBC API Documentation
- Fundamentals of Java Servlets
- Developing Scalable, Reliable, Business Applications with Servlets
- Struts Framework, Spring framework

M. Academic Integrity

Students are reminded about AUI regulations on cheating and plagiarism as outlined on page 70 of the catalogue. In particular "complete honesty is required of students in the presentation of any and all phases of course work as their own. This applies to quizzes of any length, as well as to all examinations, daily reports, lab work and term papers".