**COEN 4620 Modern Programming Practices**

**Class schedule:** 3 credit course, meeting for 3 50-minute periods each week.

**Course coordinator:** Richard Povinelli

**Course materials:** None

**Catalog description:** Explores advanced topics in computer programming. Topics may include: design patterns, advanced graphical components, software component models such as Java Beans, the Java Security model, Java and databases, servlets, Java Server Pages, and Enterprise Java Beans.

**Prerequisites:** COSC 2100 Data Structures and Algorithms orCOSC 2010 Data Structures for Engineers or equivalent experience.

**Selected Elective** in ELEN Computer Hardware & Software area, COEN Software area (breadth and depth)

**Professional component:**

Engineering science – 25%

Engineering design – 75%

**Course Goals:**

This is an advanced programming class with an emphasis on designing and implementing substantial software systems using advanced concepts. The goals of this class will vary as programming practices continue to evolve. Students will be asked to submit their personal goals and specific outcomes during the first few weeks of the class. A sample set of course goals is as follows:

* Present the concept of design patterns and illustrate the use of design patterns in designing and implementing Java programs
* Introduce the Swing set of graphical components and illustrate their use in GUI front ends
* Introduce the Java Beans component model and several examples of using Java Beans in the design and implementation of Java software
* Present the Java Security Model and illustrate its use in the design and implementation of Java software
* Provide examples of the Java Database Connection model (JDBC) and illustrate the use of JDBC in the design and implementation of Java programs
* Present the servlet architecture and Java Server Pages (JSP) as models for client-server systems

**Specific outcomes of instruction**The outcomes for this class will vary as programming practices continue to evolve. Students will be asked to submit their personal goals and specific outcomes during the first few weeks of the class. A sample set of specific outcomes is as follows:

*By the end of this course, you should....*

1. Know what a design pattern is and how to use design patterns in software design.
2. Be able to use most of the graphical components in the Swing set.
3. Understand the Java Beans architecture and be able to design and implement simple Java Beans and use them to assemble more complex software systems.
4. Understand the Java Security model and be able to design and implement Java software systems that employ cryptography, digital signatures, and authentication.
5. Know how to integrate a Java program with a database using the JDBC API.
6. Understand the servlet architecture and be able to design and implement servlets to create a client server application.
7. Understand the JSP architecture and be able to design and implement an application that employs servlets and JSP.
8. Be able to use the RMI API to access remote methods on a server machine.

**Student outcomes addressed by the course:**Partial fulfillment of Criterion 3 objectives A, C, E, G, H, I, J, and K

**Brief list of topics to be covered**

The topics for this class will vary as programming practices continue to evolve, shaping student interests. A student survey completed on the first day of class is used to select the instructor’s lecture topics. Students teach much of the class themselves in presenting their programming projects to their classmates. An example set of topics focusing on advanced programming in Java is presented here.

Introduction to Design Patterns

Advanced Graphical Components

Java Beans

Java Security Model

JDBC

Servlets

JSP

RMI

Last modified: October 20, 2015