**CMPS 3390 Client, Server, Internet and Hand-held Device Programming**

**Catalog Description**

**CMPS 3390 Client, Server, Internet and Hand-held Device Programming (4)**

This course will use Java’s features and libraries to explore client-side, server-side, and internet programming. The concepts of multi-threading, synchronization, and network programming (socket and remote-method invocation) will be introduced and used to develop internet client-server programs such as chat room, on-line help, file transfer, etc. The concepts of graphic user interfaces (GUIs) and hand-held devices (such as Android phone or tablets) will be discussed and applied in student projects. Prerequisites: CMPS 2010 and CMPS 2020.

**Prerequisites by Topic**

Attendances should know C/C++, or C# programming language and data structures.

**Units and Contact Time**

4 semester units. 3 units lecture (150 minutes), 1 unit lab (150 minutes).

**Type**

Required for Computer Information System Track, and elective course Computer Science Track.

**Required Textbook**

**Recommended Textbook and Other Supplemental Materials**

1. ACM/IEEE Body of Knowledge Topics:
2. OS/Concurrency
3. NC/Networked Applications
4. NC/Mobile Computing
5. HC/Building GUI Interfaces
6. HC/GUI Design
7. HC/GUI Programming
8. HC/Interaction Design For New Environments

 **Coordinator(s)**

Huaqing Wang

**Student Learning Outcomes**

ACM/IEEE Body of Knowledge Topics:

**ABET Outcome Coverage**

1. 3c.  An ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs.
2. 3i.  An ability to use current techniques, skills, and tools necessary for computing practice.
3. 3j.  An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
4. 3k.  An ability to apply design and development principles in the construction of software systems of varying complexity.

**Lecture Topics and Rough Schedule**

Week 1 From C++(or C#) to Java, comparsons of C++ and Java on primitive data types used, OOP features.

 and C++. Apply OOP of Java to design a group of classes.

Week 2 Java user defined types, interfaces, inner classes, packages, and applications of classes, and interfaces

Week 3 Comparison of generic classes and functions of Java and C++. Apply the generic classes and functions to design and implement basic ADT such as lists, stacks, queue and hash table.

Week 4 Java Input and output package. Introduction to Java Byte-based and character-based I/O. The organizations of java.io package and application of file IO.

Week 5 Introduction of graphical user interface (GUI); the GUI components, events and event handling. Usage of

 GUI components in applications.

Week 6 Introduction of concurrency threads and applications of threads.

Week 7 Memory sharing and thread synchronization. Application of concurrency, multithreading and synchronization.

Week 8 Introduction of networking programming, Java sockets. Applications of GUI, threads,

 synchronization, and application-level concurrency.

Week 9 Remote Procedure calls and Remote Method Invocations (RMI)

Week 10 Piped Input and Output and Piping. The application of threading, synchronization and pipeline.

Week 11 Java applets and servlets and application of applet and servlet.

Week 12 Java Database Connectivity (JDBC). Application of servlet, RMI and JDBC

Week 13 Introduction of Android programming

Week 14 More Android programming

Week 15 Project week

**Design Content Description**

None

**Prepared By**

Huaqing Wang on [date]

**Approval**

Approved by CEE/CS Department on [date]
Effective [term]