**CMPS 394 Client, Server, Internet and Hand-held Device Programming**

**Catalog Description**

**CMPS 394 Client, Server, Internet and Hand-held Device Programming (5)**

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 those concepts will be 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 class projects. Meets for 200 minutes of lecture and 150 minutes of lab. Prerequisites: CMPS 222 and 223.

**Prerequisites by Topic**

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

**Units and Contact Time**

5 quarter units. 4 units lecture (200 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. Java Programming Language Specification : <http://docs.oracle.com/javase/specs/jls/se7/html/index.html>
2. Java programming language Application Programming Interface (API) <http://docs.oracle.com/javase/7/docs/api/>
3. Java Tutorial: <http://docs.oracle.com/javase/tutorial/>
4. Android Developer website (Android reference, training and sample programs): <http://developer.android.com/index.html>

 **Coordinator(s)**

Huaqing Wang

**Student Learning Outcomes**

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

**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 Basics of Java Languages, primitive data types, used defined types, OOP features, and comparison of Java

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

Week 2 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 3 Introduction of graphical user interface (GUI); the GUI components, events and event handling. Usage of

 GUI component in applications.

Week 4, 5 Introduction of threads and memory sharing, multithreading and synchronization, and concepts of concurrency. Applications of multithreading and synchronization to classic synchronization problems.

Week 6, 7 Introduction of networking programming; Sockets and remote method invocations. Applications of GUI,

 threads, synchronization, and application-level concurrency.

Week 8 Piped Input and Output and Piping. The application of threading, synchronization and pipeling.

Week 9 Introduction of applets, servlets, and JDBC. Application of servlet and JDBC.

Week 10 Introduction of Android programming.

**Design Content Description**

None

**Prepared By**

Huaqing Wang on [date]

**Approval**

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