<table>
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<tr>
<th>Dept Number</th>
<th>CS 412</th>
<th>Course Title</th>
<th>Programming Distributed Applications</th>
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<tr>
<td>Semester Hours</td>
<td>3</td>
<td>Course Coordinator</td>
<td>Shahram Rahimi</td>
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<td>Catalog Description</td>
<td>This course uses advanced features of the Java programming language to develop networked, distributed, and web-based applications. Topics covered include, but are not limited to, sockets, data grams, the Java security model, threads, multi-tier architectures, Java RMI, Java database connectivity, and Java-based mobile agents.</td>
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**Textbooks**


**References**

**Course Learning Outcomes**

- To learn to develop network and distributed applications and network components.
- To learn advanced topics in Java.

**Assessment of the Contribution to Program Outcomes**

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<th>Outcome</th>
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<tr>
<td>Assessed</td>
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**Prerequisites by Topic**

CS 306 with a grade of C or better.

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**Major Topics Covered in the Course**
1. Introduction to networking concepts: computer networks and the internet, overview of OSI reference model, overview of TCP and UDP, hosts, ports, sockets and datagram’s, client/server architecture {3 classes}

2. Java review: review of object-oriented programming concepts, objects, classes and interfaces in Java, applications vs. applets, programming with Java class libraries {5 classes}

3. Stream based I/O in Java: overview of I/O streams, Java’s stream classes, object serialization exception handling {5 classes}

4. Network programming in Java: the java.net package, sockets, data grams, URLs, introduction to Java security model, introduction to threads and concurrent servers {5 classes}

5. Introduction to distributed computing: distributed systems, multi-tier architectures, basic RPC mechanisms, distributed objects {5 classes}

6. Distributed computing with Java RMI: remote interfaces, objects and methods, passing object arguments via serialization, generating stubs and skeletons, registering remote objects, locating and using remote objects {5 classes}

7. Java database connectivity: structured query language, transaction processing {4 classes}

8. Java-based mobile agents: software agent technology, agent platforms {5 classes}

9. Server side programming: servlets and java server pages {3 classes}