<table>
<thead>
<tr>
<th>Dept Number</th>
<th>CS 412</th>
<th>Course Title</th>
<th>Programming Distributed Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester Hours</td>
<td>3</td>
<td>Course Coordinator</td>
<td>Nick Rahimi SP15</td>
</tr>
<tr>
<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, datagrams, the Java security model, threads, multi-tier architectures, Java RMI, Java database connectivity, and Java-based mobile agents.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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 Student Outcomes**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessed</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Prerequisites by Topic**

CS 306 with a grade of C or better.
### 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)