EE-4723
Computer and Network Security

Curricular Designation: EE: elective       CpE: elective

Catalog Description:
EE 4723 – Computer and Network Security Learn fundamental of cryptography and its application to network security. Understand network security threats, security services, and countermeasures. Acquire background knowledge on well known network security protocols. Address open research issues in network security. Credits: 3.0 Lec-Rec-Lab: (3-0-0)
Semesters Offered: Spring  Pre-requisites: EE 4272

Textbooks(s) and/or Other Required Materials:

Prerequisites by Topic:
1. Familiarity with principles and operations of architecture and protocols of the computer and data networks.
2. Familiarity with introduction to permutations and combinations.
3. Familiarity with high-level-language computer programming, including Java/C/C++.

Course Objectives:
1. Introduction to fundamental principles of cryptography and its applications to network and communication security.
2. Introduction of the fundamental tools in cryptography and the protocols that enable their applications to network and communication security.
4. Familiarity with various cryptography and key distribution and management algorithms.
5. Exposure to network security design pitfalls.
6. Exposure to well known network security protocols.
7. Exposure to wireless network design alternatives.

Topics Covered:
1. Cryptography and its application to network security.
2. Basic key distribution and management mechanisms.
4. Well known network security protocols such as Kerberos, IPSec, SSL, PGP& PKI, WEP.
8. Course project/Term paper.
### Relationship of the Course Content to Program Outcomes:

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Topics and Level of Coverage</th>
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<tbody>
<tr>
<td>a</td>
<td>an ability to apply knowledge of mathematics, science and engineering</td>
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<tr>
<td>b</td>
<td>an ability to design and conduct experiments, as well as to analyze and interpret data</td>
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<tr>
<td>c</td>
<td>the ability to design a system, component, or process to meet desired needs within realistic constraints such as...</td>
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<td>d</td>
<td>an ability to function on multi-disciplinary teams</td>
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<td>e</td>
<td>an ability to identify, formulate and solve engineering problems</td>
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<td>f</td>
<td>an understanding of professional and ethical responsibility</td>
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<td>g</td>
<td>an ability to communicate effectively</td>
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<td>h</td>
<td>the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context</td>
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<tr>
<td>i</td>
<td>a recognition of the need for, and an ability to engage in life-long learning</td>
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<td>j</td>
<td>a knowledge of contemporary issues</td>
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<td>k</td>
<td>the ability to use the techniques, skills, and modern engineering tools necessary for the practice of electrical engineering</td>
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### Contribution of Course to Meeting Degree Requirements:

**3 Credit Hours – Engineering Topics**

**Class/Laboratory Schedule** (note: 1 hour = 50 minutes):
Lecture: 42 hours = 3 hours/week for 14 weeks

**Prepared by:**
Chunxiao (Tricia) Chigan, Associate Professor, October 1, 2009