PURDUE UNIVERSITY  
REQUEST FOR ADDITION, EXPIRATION,  
OR REVISION OF AN UNDERGRADUATE COURSE  
(10000-40000 LEVEL)  

DEPARTMENT: Electrical and Computer Engineering  
EFFECTIVE SESSION: Fall 2009  

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- New course with supporting documents  
- Add existing course offered at another campus  
- Expiration of a course  
- Change in course number  
- Change in course title  
- Change in course credit/ype  
- Change in course attributes (department head signature only)  
- Change in instructional hours  
- Change in course description  
- Change in course requisites  
- Change in semesters offered (department head signature only)  
- Transfer from one department to another  

PROPOSED:  
Subject Abbreviation: ECE  
Course Number: 40400  
Long Title: Introduction to Computer Security  
Short Title: Intro to Computer Security  

EXISTING:  
Subject Abbreviation:  
Course Number:  
Long Title:  
Short Title:  
Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)  

TERMS OFFERED:  
Check All That Apply:  
- Summer  
- Fall  
- Spring  

CAMPUS(ES) INVOLVED:  
- Calumet  
- Cont Ed  
- Ft. Wayne  
- Indianapolis  
- N. Central  
- Tech Statewide  
- W. Lafayette  

CREDIT TYPE:  
1. Fixed Credit: Cr. Hrs. 3  
2. Variable Credit Range:  
   Minimum Cr. Hrs.  
   Maximum Cr. Hrs.  
   Equivalent Credit: Yes  

3. Equivalent Credit:  
   Minimum Cr. Hrs.  
   Maximum Cr. Hrs.  
   Equivalent Credit: Yes  
   No  

COURSE ATTRIBUTES:  
Check All That Apply:  
1. Pass/Fail Pass Only  
2. Satisfactory/Unsatisfactory Only  
3. Repeatable  
4. Credit by Examination  
5. Special Fees  
6. Registration Approval Type  
   Department  
   Instructor  
7. Variable Title  
8. Honors  
9. Full Time Privilege  
10. Off Campus Experience  

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):  
Introduction to security issues related to the operation of computers and the workings of computer networks. Topics covered include introduction to cryptography, authentication protocols, digital signature algorithms, internet vulnerabilities, worms and virus propagation, denial of service attacks, etc. The students will also learn how to design firewalls to protect a system against unwanted intrusions.  
Prerequisite: ECE 368  

Calumet Department Head:  
Date:  
Calumet School Dean:  
Date:  

Ft. Wayne Department Head:  
Date:  
Ft. Wayne School Dean:  
Date:  

Indianapolis Department Head:  
Date:  
Indianapolis School Dean:  
Date:  

North Central Department Head:  
Date:  
North Central Chancellor:  
Date:  

West Lafayette Department Head:  
Date:  
West Lafayette College/School Dean:  
Date:  

OFFICE OF THE REGISTRAR  

3/1/07  

3/6/09
TO: The Engineering Faculty
FROM: The Faculty of the School of Electrical and Computer Engineering
RE: New Undergraduate Level Course: ECE 404

The faculty of the School of Electrical and Computer Engineering has approved the following new course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

ECE 404  Introduction to Computer Security
Sem. 2, Class 3, Cr. 3.
Prerequisite: ECE 368.

Introduction to security issues related to the operation of computers and the workings of computer networks. Topics covered include introduction to cryptography, authentication protocols, digital signature algorithms, internet vulnerabilities, worms and virus propagation, denial of service attacks, etc. The students will also learn how to design firewalls to protect a system against unwanted intrusions.

Reason: This course will focus on security issues related to the operation of computers and computer networks. These topics are not covered by other ECE courses. The course will not only provide an overview of current technologies, but also identify security challenges that face computer engineers, software developers, and network designers and therefore prepare the students for both academic research, and careers in the software industry. This course has been taught previously as ECE 495F in Fall 2003, Spring 2005, Spring 2006, & Spring 2007 and is also being offered in Spring 2008.

M. J. T. Smith, Head
School of Electrical and Computer Engineering
ECE 495F Introduction to Computer Security
Lecture Hours: 3. Credits: 3.
This course may be used as a Computer Engineering Elective for the BScmpE.

Prerequisites: EE 368

Prerequisites by Topic: Knowledge of data structures and the ability to program in C.

Catalog Description: Introduction to security issues related to the operation of computers and the workings of computer networks. Topics covered include introduction to cryptography, authentication protocols, digital signature algorithms, internet vulnerabilities, worms and virus propagation, denial of service attacks, etc. The students will also learn how to design firewalls to protect a system against unwanted intrusions.

Required Text(s):

Recommended Reference(s):

Course Outcomes:
A student who successfully fulfills the course requirements will have demonstrated:
1. sufficient understanding of TCP/IP to understand vulnerabilities of and defenses for TCP/IP.
2. an introductory level of knowledge on secure protocols, their use and their limitations.
3. knowledge of how to access and understand CERT, IETF and SANS advisories.
4. an ability to implement and design basic rule-based firewall/intrusion detection systems.

Lecture Outline:
<table>
<thead>
<tr>
<th>Weeks</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Overview of security, history, legal issues</td>
</tr>
<tr>
<td>2</td>
<td>Review/introduction to TCP/IP</td>
</tr>
<tr>
<td>1</td>
<td>Reconnaissance and scanning</td>
</tr>
<tr>
<td>1</td>
<td>Sniffing and spoofing</td>
</tr>
<tr>
<td>1</td>
<td>Secure protocols, eg., SSL, IPSec</td>
</tr>
<tr>
<td>1</td>
<td>Authentication protocols</td>
</tr>
<tr>
<td>1</td>
<td>Brief introduction to cryptography</td>
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<tr>
<td>1</td>
<td>Man-in-the-middle attacks and session hijacking</td>
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<tr>
<td>3</td>
<td>Attacks: buffer overflows, password cracking, race conditions trojans, rootkits, denial of service</td>
</tr>
<tr>
<td>1</td>
<td>Firewalls and intrusion detection (signature and anomaly)</td>
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<tr>
<td>1</td>
<td>Viruses and worms</td>
</tr>
<tr>
<td>1</td>
<td>DNS vulnerabilities and DNSSec</td>
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