PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION, OR REVISION OF A GRADUATE COURSE (50000-60000 LEVEL)

DEPARTMENT

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

- [X] New course with supporting documents (complete proposal form)
- Change in course attributes
- Addition of course not offered at another campus
- Change in instructional hours
- Expiration of a course
- Change in course description
- Change in course number
- Change in course requisites
- Change in course title
- Change in semesters offered
- Change in course credit/type
- Transfer from one department to another

PROPOSED:

- Subject Abbreviation: ACS
- Course Number: 545
- Long Title: Cryptography and Network Security
- Short Title: Crypto & Net Security

EXISTING:

- Subject Abbreviation
- Course Number

TERMS OFFERED:

- Check All That Apply:
  - [X] Summer
  - [X] Fall
  - [X] Spring

CAMPUS(ES) INVOLVED:

- Column
- Cont Ed
- Tech Statewide
- Ft. Wayne
- Indianapolis
- W. Lafayette

CREDIT TYPE:

- Fixed Credit: Cr. Hrs.: 3
- Variable Credit Range: Minimum Cr. Hrs. (Check One) To Maximum Cr. Hrs.  Yes No
- Equivalent Credit: Yes No
- Thesis Credit: Yes No

COURSE ATTRIBUTES:

- Pass/No Pass Only
- Satisfactory/Unsatisfactory Only
- Repeatable
- Maximum Repeatable Credit:
- Credit by Examination
- Special Fees: Yes No
- Instructor
- Registration Approval Type: Department
- Variable Title
- Honors
- Full Time Privilege
- Off Campus Experience

Schedule Type

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Recitation</th>
<th>Presentation</th>
<th>Laboratory</th>
<th>Lab Prep</th>
<th>Studio</th>
<th>Distance</th>
<th>Clinic</th>
<th>Experiential</th>
<th>Research</th>
<th>Ind. Study</th>
<th>Pass/Diss</th>
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<table>
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<tr>
<th>Minutes Per Hour</th>
<th>Meetings Per Week</th>
<th>Weeks Offered</th>
<th>% of Credit Allocated</th>
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<tbody>
<tr>
<td>180</td>
<td>1</td>
<td>15</td>
<td>100</td>
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Cross-Listed Courses

OFFICE OF THE REGISTRAR

FOR: CS 374 and CS 486, or permission of instructor. This is an in-depth course to network security. The topics include cryptography, security principles, tests, architecture and protocol for security services, security verification and design, and securing network systems and applications. Design projects and/or research papers are required.
Supporting Document for a New Graduate Course

To: Purdue University Graduate Council
From: Faculty Member: David Q. Liu
Department: Computer Science
Campus: Fort Wayne
Date: March 31, 2009
Subject: Proposal for New Graduate Course-Documentation Required by the Graduate Council to Accompany Registrar’s Form 40G

Contact for information if questions arise:
Name: David Q. Liu
Phone Number: 260-481-0182
E-mail: llud@ipfw.edu
Campus Address: ET 125G, Fort Wayne

Course Subject Abbreviation and Number: ACS 545
Course Title: Cryptography and Network Security

A. Justification for the Course:

• Provide a complete and detailed explanation of the need for the course (e.g., in the preparation of students, in providing new knowledge/training in one or more topics, in meeting degree requirements, etc.), how the course contributes to existing fields of study and/or areas of specialization, and how the course relates to other graduate courses offered by the department, other departments, or interdisciplinary programs.

• Justify the level of the proposed graduate course (50000- or 60000-level) including statements on, but not limited to: (1) the target audience, including the anticipated number of undergraduate and graduate students who will enroll in the course; and (2) the rigor of the course.

B. Learning Outcomes and Method of Evaluation or Assessment:

• Describe the course objectives and student learning outcomes that address the objectives (i.e., knowledge, communication, critical thinking, ethical research, etc.).

• Describe the methods of evaluation or assessment of student learning outcomes. (Include evidence for both direct and indirect methods.)

• Grading criteria (select from dropdown box); include a statement describing the criteria that will be used to assess students and how the final grade will be determined.

Criteria: Exams and Quizzes
• Identify the method(s) of instruction (select from dropdown box) and describe how the
methods promote the likely success of the desired student learning outcomes.

Method of Instruction [Lecture]

C. Prerequisite(s):

• List prerequisite courses by subject abbreviation, number, and title.

• List other prerequisites and/or experiences/background required. If no prerequisites are indicated, provide an explanation for their absence.

D. Course Instructor(s):

• Provide the name, rank, and department/program affiliation of the instructor(s).

• Is the instructor currently a member of the Graduate Faculty?  X  Yes  ___ No
(If the answer is no, indicate when it is expected that a request will be submitted.)

E. Course Outline:

• Provide an outline of topics to be covered and indicate the relative amount of time or emphasis devoted to each topic. If laboratory or field experiences are used to supplement a lecture course, explain the value of the experience(s) to enhance the quality of the course and student learning. For special topics courses, include a sample outline of a course that would be offered under the proposed course.

F. Reading List (including course text):

• A primary reading list or bibliography should be limited to material the students will be required to read in order to successfully complete the course. It should not be a compilation of general reference material.

• A secondary reading list or bibliography should include material students may use as background information.

G. Library Resources

• Describe the library resources that are currently available or the resources needed to support this proposed course.

H. Example of a Course Syllabus  (While not a necessary component of this supporting document, an example of a course syllabus is available, for information, by clicking on the link below, which goes to the Graduate School’s Policies and Procedures Manual for Administering Graduate Student Programs. See Appendix K.)


(Revised and Approved by the Graduate Council 2/08)
ACS 545
Cryptography and Network Security

Course Description

This is an in-depth course to cryptography and network security. The topics include cryptography, security principles, treats, architecture and protocol for security services, security verification and design, and securing network systems and applications. Design projects and/or research papers are required.

Justification for the Course

Network security is one of the most active and important research and application areas in Computer Science. It is an essential that students understand network security issues and have a solid foundation in designing and developing secure network systems and application. This course will provide students with a practical and theoretical knowledge of cryptography and network security.

Level of the Course

This is designed as a graduate level course in applied computer science. The students will usually have undergraduate degrees and satisfy the course prerequisites. Estimated enrollments are 10 students the first year to a steady-state enrollment of about 20 students in the fifth year.

Learning Outcomes

1. Understand cryptography and network security concepts and application
2. Apply security principles to system design
3. Identify and investigate network security threat
4. Analyze and design network security protocols
5. Conduct research in network security

Method of Evaluation or Assessment

The students will be evaluated based on homework assignments, exams, design projects, and/or research papers.

Prerequisites

CS 374 and CS 486, or permission of instructor.
Course Instructor

David Q. Liu, Assistant Professor of Computer Science, Graduate Faculty

Course Outline:

Week 1: Overview of network security
Week 2: Secret key encryption
Week 3: Public key encryption
Week 4: Protocols for key distribution and management
Week 5: Digital Signatures
Week 6: Authentication Protocols
Week 7: Integrity, privacy, authorization
Week 8: Web security & Midterm
Week 9: System security
Week 10: Firewalls and intrusion detection
Week 11: IP security and Virtual Private Networks (VPNs)
Week 12: Security in routing
Week 13: Denial of Service (DoS) attacks and defense
Week 14: Wireless security
Week 15: Testing, verification and design of security properties, and integrating people, processes and technologies
Week 16: Final Exam

Reading List:

Text:


Reference texts and manuals


Library Resources:

IPFW library provides IEE and ACM digital libraries for study and research