ADVANCED NETWORK SECURITY

1. Thông tin về học phần (General Information)

Tên học phần (Course name):   Advanced Network Security

Mã học phần (Course code):   INT1483

Số tín chỉ (Number of credits):   3

Loại học phần (Course type):   Elective

Học phần tiên quyết (Prerequisites):

Học phần trước (Previous courses): Network Security (INT1482)

Học phần song hành (Parallel courses):

Các yêu cầu đối với học phần (Course requirements):

- Lecture room: Projector, microphone and speaker.
- Laboratory: LAN computers with internet connection.

Giờ tín chỉ đối với các hoạt động (Teaching and Learning hours):

- Lý thuyết (Lectures):   30h
- Bài tập (Exercises):   0h
- Bài tập lớn (Projects):   8h
- Thực hành (Labs):   7h
- Tự học (Individual reading):   0h

Địa chỉ Khoa/Bộ môn phụ trách học phần (Address of the Faculty/Department in charge of the course):

- Address: Faculty of Information Technology 1 - Posts and Telecommunications Institute of Technology, Km10, Nguyen Trai Street, Ha Dong District, Hanoi.
- Phone number: (024) 33510432

2. Mục tiêu học phần (Objectives)

Về kiến thức (Knowledge):

The aim of this course is to provide students with the in-depth knowledge network security, including:

- techniques and technologies to ensure security of network systems;
- secure communication protocols and techniques;
- cloud computing, its security issues and measures.

Kỹ năng (Skills):

The aim of this course is to equip students with skills in:

- advanced analyzing security risks and threats to the network systems;
- identifying network attack types and deploying appropriate solutions with advanced techniques.

Thái độ, Chuyên cần (Attitude):

Students must ensure the required class attendance, assigned projects & labs and self-studying hours.

3. Tóm tắt nội dung học phần (Description)

The course provides in-depth knowledge about the advanced techniques to ensure network security, including advanced security techniques for network infrastructure; information security techniques and protocols; security solutions for local area networks, wireless computer networks, Intranet network, and mobile networks; security issues, security architecture and measures to ensure data security in cloud computing.

4. Nội dung chi tiết học phần (Outlines)
Chapter 1: Techniques and technologies to ensure network security
1.1. Access control
  1.1.1. Physical security control
  1.1.2. Authentication method
  1.1.3. Access control method
1.2. Firewall
  1.2.1. Concept of firewalls
  1.2.2. Some kind of firewall
  1.2.3. Some auxiliary functions
  1.2.4. Deploy firewall
1.3. Virtual private network technology
  1.3.1. Mechanism of action
  1.3.2. Virtual private network protocols
  1.3.3. Deploy virtual private network
1.4. Honeypot system
  1.4.1. Concept of honeypot system
  1.4.2. Types of honeypot
  1.4.3. Deploying honeypot system
  1.4.4. Exercise on configuring and deploying honeypot
1.5. DDoS protection
  1.5.1. Analysis of DDoS attacks in the Internet
  1.5.2. DDoS prevention method
  1.5.3. The network architecture supports IP search

Chapter 2: Information security techniques on networks
2.1. Security requirements on the network
  2.1.1. Security of networks and network services
  2.1.2. Security in information exchange
  2.1.3. Security for e-commerce services
  2.1.4. Network security monitoring
2.2. Network security solutions based on encryption
  2.2.1. PKI public key infrastructure
  2.2.2. Digital signatures
  2.2.3. Digital certificate
  2.2.4. Hybrid cryptographic systems
2.3. Information security protocols
  2.3.1. IPSec
  2.3.2. SSL / TLS, SSH
  2.3.3. PGP and S-MIME
  2.3.4. Anonymous protocols

Chapter 3: Security for network systems
3.1. Security for local area network
  3.1.1. Risks and vulnerabilities
  3.1.2. Analyze and risks assessment
  3.1.3. Security Policy

3.1.4. Secure network design with access control, firewalls and IDS
3.2. Security for wireless local area network
    3.2.1. Wireless local area network
    3.2.2. Security protocols
3.3. Security for Intranet network
    3.3.1. Risks and vulnerabilities
    3.3.2. Analyze and risks assessment
    3.3.3. Authentication and encryption
    3.3.4. User training
3.4. Security for mobile networks
    3.4.1. Mobile network
    3.4.2. Secure routing
    3.4.3. Keys management

Chapter 4: Security for cloud computing
4.1. Overview of cloud computing
    4.1.1 Architecture of cloud computing
    4.1.2 Security for cloud computing
4.2. Security issues for cloud computing
    4.2.1. Virtualization
    4.2.2. Preventive
    4.2.3. Storage
    4.2.4. Activities and networks
4.3. Security architecture in cloud computing
    4.3.1. The requirements
    4.3.2. Security models
    4.3.3. Security architecture for cloud computing
    4.3.4. Planning of operational security strategies
4.4. Data security for cloud computing
    4.4.1. Data security for cloud computing
    4.4.2. Data encryption
    4.4.3. Data classification and security strategies

5. Học liệu (Textbooks)
5.1. Học liệu bắt buộc (Required Textbooks)

[1] Roberta Bragg, Mark Rhodes-Ousley and Keith Strassberg, Network Security: The Complete Reference, McGraw-Hill Osborne Media, 2013.

5.2. Học liệu tham khảo (Optional Textbooks)

[2] Vic J.R. Winkler, Securing the Cloud: Cloud Computer Security Techniques and Tactics, Syngress, 2011.

[3] John Chirillo, Hack attacks revealed: A complete reference with custom security hacking toolkit, John Wiley & Sons, 2001.

[4] Jie Wang, Computer Network Security: Theory and Practice, Springer, 2009.

[5] Michael T. Simpson, Kent Backman, Hands-On Ethical Hacking and Network Defense, Delmar Cengage Learning, 2010.

[6] Stuart McClure, Joel Scambray and George Kurtz, Hacking Exposed 7: Network Security Secrets & Solutions, McGraw-Hill Osborne Media, 2012.

[7] William Stallings, Cryptography and Network Security, Prentice Hall, 2010.

6. Phương pháp, hình thức kiểm tra – đánh giá kết quả học tập học phần (Grading Policy)

Grading method	Percentage	Group/Individual
- Attendance	10%	Individual
- Mid-term exams	10%	Individual
- Projects	30%	Group or individual
- Final examination	50%	Individual

Trưởng Bộ môn
(Head of Department)

Giảng viên biên soạn
(Lecturer)

Hoàng Xuân Dậu

Đặng Minh Tuấn