

# SECURE SOFTWARE DEVELOPMENT

## 1. Thông tin về học phần (General Information):

**Tên học phần (Course name):** Secure Software Development

**Mã học phần (Course code):** INT1463

**Số tín chỉ (Number of credits):** 3

**Loại học phần (Course type):** Tự chọn (Elective)

**Học phần tiên quyết (Prerequisites):**

**Học phần trước (Previous courses):**

**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 Virtual machine running Linux

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

- Lý thuyết (Lectures): 34h
- Bài tập (Exercises): 0h
- Bài tập lớn (Projects): 6h
- Thực hành (Labs): 5h
- 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: Khoa Công nghệ Thông tin 1 - Học viện Công nghệ Bưu chính Viễn thông, Km10, Nguyễn Trãi, Hà Đông, Hà Nội  
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 basic knowledge about analyzing software security requirements as well as designing and implementing software securely; methods for security software testing and secure software development integration.

**Kỹ năng (Skills):**

After completing the course, students master the knowledge about developing secure software; students are capable of analyzing and verifying security requirements and incorporating them into the process of developing and implementing software projects that ensure the security requirements.

**Thái độ, Chuyên cần (Attitude):**

Students are required to attend at least 80% of lectures during the course and actively participated in discussions on given topics. Also, students must fulfill lab exercises and project by the end of the course.

### **3. Tóm tắt nội dung học phần (Abstract) (5- 6 dòng)**

The course provides basic knowledge of how to collect and analyze security requirements in software development. In addition, the course introduces security design and implementation as well as assessing the security response level of software. Finally, the course presents methods and tools to facilitate the integration between the security software development process (SSD) and the common software development process (SDLC).

### **4. Nội dung chi tiết học phần (Outlines)**

#### **Chapter 5.** Overview of secure software development (SSD)

- 5.1. Software security requirements and challenges
- 5.2. Current and future risks of insecurity
- 5.3. Effect of network environment
- 5.4. Security issues of the programming language

#### **Chapter 6.** Analyzing software security requirements

- 6.1. Collect requirements
- 6.2. Functional and non-functional security requirements
- 6.3. Mapping vulnerable components
- 6.4. Evaluation of requirements

#### **Chapter 7.** Design and implementation

- 7.1. Design
- 7.2. Implementation
- 7.3. Class level security issues
- 7.4. Procedure level security
- 7.5. Evaluation of design and implementation

#### **Chapter 8.** Software security testing

- 8.1. Static analysis
- 8.2. Dynamic analysis
- 8.3. Testing security requirements
- 8.4. Evaluation of test results

#### **Chapter 9.** Combining SSD and SDLC

- 9.1. Develop plan responding to security incidents
- 9.2. Final evaluation of security
- 9.3. Building culture in software development
- 9.4. Tools to support SSD and SDLC combination

**Project and assignment.** Students are assigned a small project and work with a group of 4 persons

4. Project requirements and guidelines is presented at the beginning of the course
5. Project outcomes are revised in the middle of the course
6. Project results are presented and graded at the end of the course

**Lab exercise.**

Students are required to complete Lab exercises under the provision and guidance of the lecturer

## **5. Học liệu (Textbooks)**

### **5.1. Học liệu bắt buộc (Required Textbooks)**

[1] Theodor Richardson, Charles N. Thies, *Secure Software Design*, Jones & Bartlett Learning, 2013.

### **5.2. Học liệu tham khảo (Reference Textbooks)**

[2] Mark Dowd; John McDonald; Justin Schuh, *The Art of Software Security Assessment: Identifying and Preventing Software Vulnerabilities*, Addison-Wesley Professional, 2006.

[3] Michael Howard, Steve Lipner, *The Security Development Lifecycle: SDL: A Process for Developing Demonstrably More Secure Software*, Microsoft Press, 2006.

[4] Mano Paul, *The 7 Qualities of Highly Secure Software*, CRC Press, 2012.

[5] Asoke K. Talukder, Manish Chaitanya, *Architecting Secure Software Systems*, Auerbach, 2009.

[6] Ian Sommerville, *Software Engineering (9th Edition)*, Addison-Wesley, 2010.

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

<b>Grading method</b>	<b>Percentage</b>	<b>Group/Individual</b>
- Attendance	10%	Individual
- Mid-term exams	10%	Individual
- Projects and Assignment	20%	Group or Individual
- Final examination	60%	Individual

**Trưởng Bộ môn  
(Head of Department)**

**Hoàng Xuân Dậu**

**Giảng viên biên soạn  
(Lecturer)**

**Phạm Hoàng Duy**