IMI62-332

Medical Information Security

Course Syllabus

Semester 2 / Academic Year 2025

Instructor:
Asst. Prof. Dr. Chananthorn Chandaeng
School of Medical Information Innovation
Walailak University

1. Course Information

Course Code: IMI62-332

Course Title: Medical Information Security

Credits: 3(3–0–6)

Class Schedule:

📅 Friday, 15:00–18:00

📍 Computer and Digital Technology Laboratory 1

2. Course Description

This course introduces the principles of cybersecurity in the context of healthcare. Students will explore cyber threats, vulnerabilities, risk assessment, IoMT security, health data protection, incident response, and the legal/ethical frameworks governing health information such as PDPA, HIPAA, ISO/IEC 27001, and relevant international standards.

3. Prerequisites

Students must complete:

- IMI62-232 Computer Networks
- ITD62-231 Internet Technology

4. Course Learning Outcomes (CLOs)

CLO1 – Knowledge (Understand)

Explain the fundamental principles and components of medical information security.

CLO2 – Skills (Analyze)

Analyze threats, vulnerabilities, and risks in healthcare environments.

CLO3 – Competency (Evaluate/Create)

Evaluate and design security controls aligned with international standards.

CLO4 – Ethics (Apply)

Apply legal, regulatory, and ethical principles related to health data protection.

5. Course Content (8 Modules)

1. Introduction to Medical Information Security
2. Health Information Systems (HIS/EHR/EMR/HIE)
3. Secure Health Data Communication (HL7, FHIR, DICOM)
4. Cyber Threats, Vulnerabilities, and Attacks
5. IoMT Security
6. Risk Assessment & Data Protection
7. Incident Response & Digital Forensics
8. Healthcare Laws, Standards, and Ethics

6. Weekly Teaching Plan (12 Weeks)

Week	Topics / Content	TLA	*Assessment	CLOs
1	Introduction to Medical Information Security	Lecture, Q&A, introductory discussion	Quiz 1	CLO1
2	Cyber Threats in Healthcare Systems	Case analysis of real incidents, discussion of ransomware cases	Worksheet 1	CLO1, CLO2
3	Health Information Systems (HIS/EHR/EMR/HIE)	Lecture, system architecture walkthrough	Quiz 2	CLO1

6. Weekly Teaching Plan (12 Weeks)

Week	Topics / Content	TLA	*Assessment	CLOs
4	Security of Health Data Communication (HL7, FHIR, DICOM)	Demonstration of data exchange, communication threat analysis	Quiz 3	CLO1, CLO2
5	Cyberattacks, Vulnerabilities, and Exploits	Workshop: Vulnerability scenario analysis	Participation	CLO2
6	**Midterm Examination (Covering Week 1–4)**	–	Midterm Exam (15%)	CLO1, CLO2

6. Weekly Teaching Plan (12 Weeks)

Week	Topics / Content	TLA	*Assessment	CLOs
7	IoMT Security (Medical Devices & Connected Systems)	Case Study: Attacks on infusion pumps, pacemakers	Worksheet 2	CLO2
8	Risk Assessment in Healthcare Environments	Workshop: Risk identification, analysis, mitigation planning	Risk Analysis Exercise	CLO2, CLO3
9	Data Protection & Data Governance	Group activity: Designing Data Protection Policy	Group Report (10%)	CLO3

6. Weekly Teaching Plan (12 Weeks)

Week	Topics / Content	TLA	*Assessment	CLOs
10	Incident Response & Data Breach Handling	Tabletop simulation of cyber incident	Participation + Scenario Analysis	CLO3
11	Healthcare Regulations, Standards, and Ethics (PDPA, HIPAA, ISO 27001)	Discussion: Case studies of patient data breaches	Analytical Report (10%)	CLO4
12	Course Review & Final Exam Preparation	Q&A, exam preparation, content summary	Participation	CLO1–4

7. Teaching Methods

- Lectures and demonstrations
- Case study discussions
- Workshop: Risk & threat analysis
- Tabletop simulation: Incident response
- Analytical report and group presentation

8. Assessment Overview

Assessment Item	Weight
Weekly Quizzes	30%
Analytical Report	10%
Class Participation & Activities	25%
Midterm Exam	15%
Final Exam	20%

9. Study Materials

Core Standards & Frameworks

- PDPA (Thailand)
- HIPAA Security Rule
- ISO/IEC 27001 & ISO 27799
- NIST Cybersecurity Framework
- HC3 & WHO Cybersecurity Reports

Supplementary Materials

- Weekly lecture notes
- Research articles on IoMT & Healthcare Cybersecurity

10. Course Policies

- Minimum 80% attendance required
- Academic integrity is mandatory
- Assignments must be submitted on time
- Respect patient privacy and ethical responsibilities
- Follow PDPA and institutional data governance rules

11. Instructor Contact

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Welcome to IMI62-332

Medical Information Security

Let’s explore and strengthen cybersecurity in the healthcare world together.