



Master of Science Program in Professional Cybersecurity
(International Program)
New Curriculum, Year 2023

Faculty of Engineering and Technology
Siam Technology College

1. Curriculum

1.1 Total Credits **36 credits**

1.2 Curriculum Structure

Plan 2 (Independent Study)

Non-Credit Courses	0	credits
Core Course	3	credits
Required Courses	9	credits
Elective Courses	18	credits
Independent Study	6	credits

2. Courses According to the Curriculum Structure

2.1 Core Course 3 credits

Code	Course name	Credit	Prerequisite
870 501	Research Methodology	3(3-0-6)	

2.2 Required Courses 9 credits

Code	Course name	Credit	Prerequisite
871 501	Ethical Hacking	3(3-0-6)	
871 502	Computer Networks & Security	3(3-0-6)	
871 601	Advanced Programming	3(2-2-5)	

2.3 Elective Courses 18 credits

Code	Course name	Credit	Prerequisite
872 501	Digital and Network Forensics	3(3-0-6)	
872 502	Penetration Testing	3(2-2-5)	
872 503	Cybersecurity Ethics and Law	3(3-0-6)	
872 504	Cloud Computing	3(3-0-6)	
872 505	Cloud Security	3(3-0-6)	
872 506	Web Security	3(3-0-6)	
872 507	Mobile and Wireless network Security	3(3-0-6)	
872 508	Secure Software Development	3(3-0-6)	

Code	Course name	Credit	Prerequisite
872 509	Cryptography	3(3-0-6)	
872 510	Special Topic in Cyber Security I	3(3-0-6)	
872 601	Special Topic in Cyber Security 2	3(3-0-6)	
872 602	Special Topic in Cyber Security 3	3(3-0-6)	
872 603	Special Topic in Cyber Security 4	3(2-2-5)	
872 604	Information Assurance and Risk Management	3(3-0-6)	
872 605	Information Security Management and Awareness	3(3-0-6)	
872 606	Enterprise Security Architecture	3(3-0-6)	
872 607	Information Security Auditing	3(3-0-6)	
872 608	Operating Systems & Security	3(3-0-6)	
872 609	Malware Analysis	3(3-0-6)	
872 610	Security Operations Center and Cyber Threat Hunting	3(3-0-6)	
872 611	Quantum Computing	3(3-0-6)	
872 612	Quantum Cryptography	3(3-0-6)	
872 613	Artificial Intelligence Security	3(3-0-6)	

2.4 Independent Study 6 credits

Code	Course name	Credit	Prerequisite
874 601	Independent Study	6(0-0-18)	

2.5 Study Plan

Year 1 / First Semester			
Code	Course name	Credit	
870 501	Research Methodology	3(3-0-6)	
871 501	Ethical Hacking	3(3-0-6)	

871 502	Computer Networks & Security	3(3-0-6)
Total		9

Year 1 / Second Semester		
Code	Course name	Credit
871-601	Advanced Programming	3(2-2-5)
872-XXX	Elective Courses 1	3(X-X-X)
872-XXX	Elective Courses 2	3(X-X-X)
Total		9

Year 2 / First Semester		
Code	Course name	Credit
872-XXX	Elective Courses 3	3(X-X-X)
872-XXX	Elective Courses 4	3(X-X-X)
872-XXX	Elective Courses 5	3(X-X-X)
872-XXX	Elective Courses 6	3(X-X-X)
Total		12

Year 2 / Second Semester		
Code	Course name	Credit
874 601	Independent Study	6(0-0-18)
Total		6

2.6 Expectations of learning outcomes at the end of semester (Specified in each academic year until the completion of the course)

Year	Details Year
Year 1	Have advanced algorithm and programming skills, good math and statistics, deep knowledge in computer and information technology concerning data analysis or cybersecurity, and entrepreneurial experience.
Year 2	Integrate knowledge in computer and information technology towards a creative independent study or research project, aimed at solving contemporary or future IT issues.

3. Course Description

3.1 Core Course 3 credits

870-501 Research Methodology **3(3-0-6)**

Research methodology, problem study and definition, problem analysis and solving, model or results and research writing.

3.2 Required Courses 9 credits

871-501 Ethical Hacking **3(3-0-6)**

Principles of penetration testing for detecting and exploiting vulnerabilities in networked and cloud-based information systems, and making mitigation recommendations.

871-502 Computer Networks & Security **3(3-0-6)**

OSI model, TCP/IP protocol, Firewall, Intrusion Detection Systems (IDS) and Intrusion Prevention Systems (IPS), Internet, web, and network system security.

871-601 Advanced Programming 3(2-2-5)

Programming language and environments, system and/or application software development, programming with modern hardware.

3.3 Elective Courses 18 credits**872-501 Digital and Network Forensics 3(3-0-6)**

Principles of forensic science, collecting, preserving, examining, analyzing and presenting digital evidence. Digital forensic software, collecting, seizing, and protecting evidence, recovering data, incident response, operating system, email, memory, and network digital forensics.

872-502 Penetration Testing 3(2-2-5)

Methodologies, approaches, and tools for performing penetration testing and vulnerability analysis on standalone and networked applications.

872-503 Cybersecurity Ethics and Law 3(3-0-6)

Important ethical issues in cybersecurity, common ethical issues in cybersecurity, best practices for cybersecurity ethics among professionals, ethical frameworks and cyber laws.

872-504 Cloud Computing 3(3-0-6)

The concepts of cloud computing, Cloud computing mechanisms, Cloud computing architecture, Cloud platform.

872-505 Cloud Security 3(3-0-6)

Fundamental Security and Privacy Issues of the Cloud, Cloud infrastructure security, Cloud Security and Privacy Management, Hacking and Countermeasures in the Cloud, Cloud Auditing and Compliance. Cybersecurity and cyber resilience of Data Centers, Practical attacks on cloud applications.

- 872-506 Web Security 3(3-0-6)**
Offensive web application security risks, Modern Web Application Security, Web Application Security Architecture, Code Review for Security, Vulnerability Identification, and Vulnerability Management.
- 872-507 Mobile and Wireless network Security 3(3-0-6)**
Evaluate the security of modern mobile and WiFi communication technologies, and detect flaws in mobile and WiFi networks. Conduct mobile device and WiFi penetration testing, evaluating mobile applications and operating systems and the involved infrastructure.
- 872-508 Secure Software Development 3(3-0-6)**
Secure Software concepts, SDLC process security, requirements engineering security, secure designs, risk analysis, threat modeling, deploying cryptographic algorithms, defensive coding, penetration testing, and software security assessment.
- 872-509 Cryptography 3(3-0-6)**
Cryptography theory and applications, zero-knowledge, block chain, encryption, digital signatures, hash functions, and other fundamental protocols.
- 872-510 Special Topic in Cyber Security 1 3(3-0-6)**
Interesting cyber security topics providing students with additional skills in cyber security.
- 872-601 Special Topic in Cyber Security 2 3(3-0-6)**
Interesting cyber security topics providing students with additional skills in cyber security.

- 872-602 Special Topic in Cyber Security 3 3(3-0-6)**
Interesting cyber security topics providing students with additional skills in cyber security.
- 872-603 Special Topic in Cyber Security 4 3(2-2-5)**
Interesting cyber security topics providing students with additional skills in cyber security.
- 872-604 Information Assurance and Risk Management 3(3-0-6)**
Techniques for risk assessment and management, information assurance governance, disaster recovery and business continuity, security policies, and procedures, asset identification and classification, asset management life cycle, security controls, security assessment and testing.
- 872-605 Information Security Management and Awareness 3(3-0-6)**
System and management of information security, systems-design process and life-cycle security management, information-security risk management, security policies, security in the systems-engineering process, laws related to information security and management of operational systems.
- 872-606 Enterprise Security Architecture 3(3-0-6)**
Information security management system of modern enterprises. Security and risk Management, asset security, security architecture and engineering, communications and network Security, identity and access management, security assessment and testing, security operations, and software development security. modern information security tools.

- 872-607 Information Security Auditing 3(3-0-6)**
Concept of information security auditing, effective internal information security audit functions and procedures, auditing entity-level controls, auditing data centers and disaster recovery, auditing networks, WLAN and mobile devices and operating system, auditing web server and web application, auditing database and storage, auditing virtualized environments, auditing applications, auditing cloud computing and outsourced operations, auditing IT projects, auditing international frameworks and standards.
- 872-608 Operating Systems & Security 3(3-0-6)**
Evolution and architecture of operating system, memory management, virtual memory, processes management, deadlocks, file management systems, and computer security.
- 872-609 Malware Analysis 3(3-0-6)**
Cycle of detecting, responding, and analyzing systems in jeopardy, cyber-attacks, malware analysis on multiple systems, and malware analysis processes and tools. Analyzing vulnerabilities and exploits, as well as automating reverse engineering tasks.
- 872-610 Security Operations Center and Cyber Threat Hunting 3(3-0-6)**
Modern attack tactics, techniques, and procedures. Security operations staff, as well as practical skills in attack detection and investigation.
- 872-611 Quantum Computing 3(3-0-6)**
Introduction to quantum computing, quantum computers, quantum algorithms, quantum error correction, and quantum cryptography.

872-612 Quantum Cryptography 3(3-0-6)**ศึกษาก่อน : Quantum Computing**

Fundamental of quantum cryptography, cryptographic concepts and tools, protocols and proofs of security for quantum key distribution, fundamentals with device-independent quantum cryptography, current quantum cryptographic tasks and protocols.

872-613 Artificial Intelligence Security 3(3-0-6)

Machine learning techniques are used in cybersecurity and cyber resilience, and artificial intelligence models, and application tools. Threat modeling, vulnerability report, and practical attacks on AI models.

3.4 Independent Study 6 credits**874 601 Independent Study 6(0-0-18)**

Interesting modern topics and projects offer students with additional skills in cyber security.
