Subject Description Form

Subject Code	EIE4106
Subject Title	Network Management and Security
Credit Value	3
Level	4
Pre-requisite	EIE3333 Data and Computer Communication or EIE3342 Computer Network
Co-requisite/ Exclusion	Nil
Objectives	This course aims at training students to master the basic principles, knowledge, and skills about network management and network security. They will learn how to apply these principles in various scenarios by using appropriate hardware and software tools to design solutions for network management and security problems, and to evaluating performance.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Describe some common features about network management systems 2. Perform basic network management tasks with appropriate tools 3. Describe some network security services and functions 4. Analyze and evaluate some common security features of computer networks 5. Design simple network management and security systems Category B: Attributes for all-roundedness 6. Communicate Effectively 7. Understand the creative process when designing a solution to a problem
Subject Synopsis/ Indicative Syllabus	1. Network Management Functional areas in network management, network management station, agent, management information base (MIB), Simple Network Management Protocol (SNMP) 2. Network Security Security services and mechanisms, basic cryptography, authentication protocols, digital signature and public key infrastructure, firewall and virtual private network (VPN)
Teaching/Learning Methodology	Lectures: The subject matters will be delivered through lectures. Students will be engaged in the lectures through Q&A, discussions and specially designed classroom activities. Tutorials: During tutorials, students will work on/discuss some chosen topics in small group. This will help strengthen the knowledge taught in lectures. Laboratory: During laboratory exercises, students will perform hands-on tasks to practice what they have learned. They will evaluate performance of systems and design solutions to problems.

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)						
		1	2	3	4	5	6	7
1. Continuous Assessment (total: 50%)								
• Homework and assignments	15%	✓		✓	✓	✓	✓	✓
• Tests	20%	✓		✓	✓		✓	
• Laboratory exercises	15%		✓			✓		✓
2. Examination	50%	✓		✓	✓	✓	✓	✓
Total	100%							

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Assignment and homework will require students to apply what they have learnt to solve problems. They will be asked to evaluate the security features of a system, to design a system to meet network management and security requirements.

Laboratory exercises: Students will be assessed about their performance on hands-on tasks such as setting up a VPN, capturing and analyzing packets, setting up a network management system.

Tests will require the students to solve network management and security problems within a specific time and without access to other materials. This is a good way to assess students' mastery of knowledge and understanding.

Examination: This is similar to tests but in a larger scale. It can assess students' achievement of the learning outcomes in a wider spectrum.

Student Study Effort Expected

Class contact (time-tabled):	
• Lecture	24 Hours
• Tutorial/Laboratory/Practice Classes	15 Hours
Other student study effort:	
• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination	36 Hours
• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing	30 Hours
Total student study effort:	**105 Hours**

Reading List and References	**Text Book:** 1. Perez, Andre, *Network Security*, London: Hoboken, NJ: ISTE; Wiley 2014 (eBook, online access) 2. Subramanian, Mani, *Network management : principles and practice*, Pearson, 2nd ed., 2011 (PolyU Library Acc. No.: TK5105.5 .S92 2011). 3. *Network security, administration, and management advancing technology and practice*, InfoSci-Books. ; MyiLibrary, Information Science Reference, 2011 (eBook, online access). 4. Behrouz A. Forouzan, *Introduction to cryptography and network security*, New York: McGraw-Hill Higher Education, 2008 (PolyU Library Acc. No.: TK5105.59 .F672 2008). **General References and standards:** 1. Ding, Jianguo, *Advances in network management*, Books24x7, CRC Press : Auerbach Publications, 2010 (eBook, online access). 2. Clemm, Alexander, *Network Management Fundamentals*, Indianapolis, Ind.: Cisco Press, 2007 (PolyU Library Call Number: TK5105.5 .C576 2007) 3. Yusuf Bhaiji, *Network security technologies and solutions*, Indianapolis, IN: Cisco Press, 2008 (PolyU Library Call Number: TK5105.59 .B468 2008). 4. James Henry Carmouche, *IPsec virtual private network fundamentals*, Indianapolis, Ind.: Cisco Press, 2007 (PolyU Library Call Number: TK5105.567 .C37 2007). **Classics Paper** 1. Shannon, Claude Elwood, *Claude Elwood Shannon: collected papers*, Institute of Electrical and Electronics Engineers, c1993 (PolyU Library Call Number: TK5101 .S448 1993).
Last Updated	June 2016
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