Detailed Course Description - Course Plan Development and Updating Procedures/ Computer Science/Computer Network Department	QFXX/0408-3.0E

Faculty	Faculty of Science and IT	Department	Computer Science/Computer Network
Course number	0122344	Course title	Network Management
Number of credit hours	3	Pre-requisite/co-requisite	Analysis & Design Of Networks Systems

Brief course description

This course covers the technological foundations of network management used to operate large-scale networks and services. Management functions and management architectures, management building blocks (information models, management communication, protocols. The course emphasizes "learning by doing", and requires students to conduct a series of lab exercises. Through these labs, students can enhance their understanding of the principles, and be able to apply those principles to solve real problems.

	Course goals and learning outcomes
Goal 1	An ability to understand the need for interoperable network management, and understanding fundamentals of network management
Learning outcomes	1.1 Define network management 1.2 Review of data communication and network management 1.3 Explain the functions of network management 1.4 Understand concepts and terminology associated with fundamentals of network management
Goal 2	An ability to understand concepts and terminology associated with SNMP
Learning outcomes	2.1 Understand the basic Foundations (Standards, Models, and Language) 2.2 Explain the Abstract Syntax Notation One(ASN.1), and to be able to encode data by using ASN.1 and interpret encoded data in Wireshark software. 2.3 Compare between ASN.1 and programming language 2.4 Introduce simple network management protocol
Goal 3	An ability to describe and explain simple network management protocol(SNMP) and its models
Learning outcomes	3.1 Understand the organization and information models of SNMPv1 3.2 Describe SNMPv1 communication and functional models 3.3 Explain SNMPv2 and SNMPv3 3.4 Compare among SNMPv1, SNMPv2, and SNMPv3
Goal 4	An ability to understand and apply network management tools
Learning outcomes	4.1 Explain some network management tools 4.2 Build virtual lab by using GNS3 to simulate network management(SNMP) 4.3 Use open source network management tools(MIB browser, PRTG and OpenNMS). 4.4 Understand and configure Router and Host to enable of SNMP.
Textbook	1. Subramanian, Network Management: Principles and Practice, second edition, 2010, Pearson Publisher. 2. Ben Piper, Learn Cisco Network Administration in a Month of Lunches, first

	edition, 2017, Manning Publication.
Supplementary references	1. William Stallings, SNMP, SNMPv2, SNMPv3, and RMON 1 and 2, third edition, 2013, ADDISON-WESLEY. 2. Jason C. Neumann, The Book of GNS3: Build Virtual Network Labs Using Cisco, Juniper, and More, 1st edition, 2015, William Pollock. 3. René Molenaar, How to mastering CCNA, 2013, . René Molenaar 4. Network Management Fundamentals: Alexander Clemm, Ph.D. Copyright© 2007 Cisco Systems, Inc.Published by: Cisco Press.

Course timeline				
Week	**Number of hours**	**Course topics**	**Pages (textbook)**	**Notes**
01	**1** **1** **1**	Introduction to network management Data communications and network management review Network management troubleshoot tools	**24-69, textbook(1) Internet resources**	
02	**1** **1** **1**	Network management functions Review of Computer Network Technology	**70-83, textbook(1)**	
03	**1** **1** **1**	Network Management Standards. Network Management Models. Organization Model. Information Model.	144-159 **textbook(1)**	
04	**1** **1** **1**	Abstract Syntax Notation One: ASN.1.	**163-185, textbook(1)**	
05	**1** **1** **1**	Encoding Structure. Macro Encoding and decoding by using ASN.1 Functional model	**163-185, textbook(1)**	
06	**1** **1** **1**	History of SNMP Management. Internet Organizations and Standards.	**190-202, textbook(1)**	
07	**1** **1** **1**	SNMP Model. Organization and Information Models System over view **First exam**	**203-209, textbook(1)**	
08	**1** **1**	Information model:	**210-254, textbook(1)**	

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09	1 1 1	Communication model	**259-280, textbook(1)**	
10	1 1 1	Functional model MIB browser tools	**281-281, textbook(1) Ref(3+2)**	
11	1 1 1	SNMPv2. Major Changes in SNMPv2. SNMPv2 System Architecture. SNMPv2 Structure of Management Information	**286-322, textbook(1)**	
12	1 1 1	SNMPv2 Management Information Base. SNMPv2 Protocol Compatibility with SNMP1 **Second exam**	**323-339, textbook(1)**	
13	1 1 1	SNMPv3 SNMPv3 Key Features. SNMPv3 Documentation Architecture.	**345-355, textbook(1)**	
14	1 1 1	SNMPv3 Applications. SNMPv3 Management Information Base.	**356-364, textbook(1)**	
15	1 1 1	Security SNMPv3 User-based Security Model. Access Control	**365-385, textbook(1)**	
16	1 1 1	Network management tools **Final exam**	**Ref(2+3) and internet resources**	

Theoretical course evaluation methods and weight	Participation = 10% First exam 20% Second exam 20% Final exam 50%	**Practical (clinical) course evaluation methods**	Semester students' work = 50% (Reports, research, quizzes, etc.) Final exam = 50%

Approved by head of department		**Date of approval**	

Extra information (to be updated every semester by corresponding faculty member)

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