

<b>ITE4002</b>	<b>Network Management Systems</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>J</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>
<b>Pre-requisite</b>	<b>ITE3001</b>	<b>Syllabus version</b>				
		1.0				
<b>Course Objectives:</b>						
<ul style="list-style-type: none"> <li>To learn the principles behind monitoring and managing networks.</li> <li>To understand the basic requirements of network design.</li> <li>To understand the various open source tools used for network management.</li> </ul>						
<b>Expected Course Outcome:</b>						
1) Understand the principles of Network management architecture, standards and models.						
2) Analyse the network management functional areas and components.						
3) Identify the fault, isolate the network components and enhance the MIBs.						
4) Examine and analyze the models of SNMPv3 protocol.						
5) Apply the network management architectures, standards and models.						
6) Demonstrate the functions of remote network monitoring tools.						
7) Demonstrate the functions to manage open source tools.						
8) Design and conduct experiments related to network tools, analyze and interpret data.						
<b>Student Learning Outcomes (SLO):</b>		<b>2,7,17</b>				
[2]	Having a clear understanding of the subject related concepts and of contemporary issues					
[7]	Having computational thinking					
[17]	Having an ability to use techniques, skills and modern engineering tools necessary for engineering practice.					
<b>Module:1</b>	<b>Network Management Architectures &amp; Applications</b>	<b>6 hours</b>				
Management Standards and Models, Network Design Issues for the Project, Network Management Functions – Configuration, Configuration Management & Auto-discovery, Configuration Database & Reports, Abstract Syntax Notation One (ASN.1)						
<b>Module:2</b>	<b>Network management and functions</b>	<b>6 hours</b>				
Introduction- Basic Concepts and task: functional areas, SNMP, Client Pull & Server Push, Ports & UDP, Parts of SNMP, Nodes, SNMP Agents, Proxy & Gateway Agents, Basic Operations, Languages of SNMP, SNMP Data Types, Managed “Objects” & MIBs, Commercial SNMP Applications, SNMP & Windows services						
<b>Module:3</b>	<b>Network Management Functions – Fault</b>	<b>6 hours</b>				
Fault Management, Fault Identification and Isolation, Event Correlation Techniques, Simple Network Management Protocol - SNMP v2, Protocol Specification, Version 2 MIB						

Enhancements, MIB-II, Case Diagrams			
Module:4	Simple Network Management Protocol - SNMP v3		6 hours
Version 3 Protocol & MIB, Simple Network Management Protocol - SNMP v3, User Based Security Model, View Based Access Model, Network Management Functions - Accounting & Performance, Accounting Management, Performance Management, Network Usage, Metrics and Quotas			
Module:5	Network Management Architectures & Applications		6 hours
Management Standards and Models, NM Standards - International standard (ISO/OSI), Internet model, TMN Architecture, Organization Model, 2 &3 tier models, Information Model, Communication Model			
Module:6	Remote Network Monitoring RMON 1		7 hours
Statistics Collection, Alarms and Filters, Remote Network Monitoring RMON 2, Monitoring Network Protocol Traffic, Application-Layer Visibility			
Module:7	Management Open Source Tools		5 hours
OpenNMS, NMIS, op5, Nagios			
Module:8	Contemporary issues		3 hours
	Total Lecture hours:		45 hours
Text Book(s)			
1.	Verma, Dinesh Chandra, Principles of Computer Systems and Network Management, Springer, 2010		
Reference Books			
1.	Mani Subramanian, Network Management Principles and practice, Addison Wesley New York, 2010.		
2.	Ghislain Hachey, Instant OpenNMS Starter, packt, June 2013		
Recommended by Board of Studies		05-03-2016	
Approved by Academic Council		No. 40	Date 18-03-2016