

**King Fahd University of Petroleum & Minerals
College of Computer Sciences and Engineering**

**CSE 552 - Network Management (3-0-3)
Fall 2003 (Term 031)**

Syllabus

Catalog Description

Management Protocols. Remote Management. Configuration for Data Collection. Monitoring and Reconfiguration. Operational Issues in Managing Heterogeneous Networks under Different Operating Systems.

Prerequisite: (COE 540 and (ICS 431 or Equivalent)) or Consent of Instructor.

Course Description

Network Management Standards and Models. Network Management Protocols. Abstract Syntax Notation One (ASN.1). Simple Network Management Protocol (SNMP). SNMPv2 and SNMPv3. Structure of Management Information (SMI). Management Information Base (MIB). Remote Monitoring (RMON). RMON 1 and 2. Network Management Tools and Systems. Network Management Applications. Web-Based Management. Telecommunications Management Network (TMN). ATM Network Management.

Instructor: Dr. Mohammed Houssaini Sqalli

Office: 22-149 **Phone:** 1725 **Email:** sqalli@ccse.kfupm.edu.sa

Office hours: TBA, and by appointment.

Course URL: <http://www.ccse.kfupm.edu.sa/~sqalli/031/cse552>

Text Book:

“Network Management – Principles and Practice” by Mani Subramanian, Addison-Wesley Pub Co, First Edition, 2000.

Reference Book:

“SNMP, SNMPv2, SNMPv3, AND RMON 1 and 2” by William Stallings, Addison-Wesley, Third Edition, 1999.

Grading Policy:

Assignments/Quizzes	20%
Project	30%
Midterm	20%
Final Exam	25%
Attendance and participation	5%

Attendance: attendance is required by all students. Official excuse for an authorized absence must be presented to the instructor no later than one week following the absence. More than 6 unexcused absences lead to a “DN” grade.

Course Objectives:

- Gain in-depth theoretical and practical knowledge of network management, and in particular of SNMP (Simple Network Management Protocol).
- Familiarization with network management to be prepared for a career in the industry or to pursue further research on the subject.

Course Topics:

1. Data Communications and Network Management Overview (Ch. 1) (1 Week)

- Analogy of Telephone Network Management.
- Communications Protocols and Standards.
- Case Histories on Networking and Management.
- Network Management Functions.
- Network and System Management.

2. Review of Computer Network Technology (Ch. 2) (1 Week)

- Network Topology.
- Network Node Components.
- LANs and WANs.
- Transmission Technology.

3. Basic Foundations: Standards, Models, and Language (Ch. 3) (2 Weeks)

- Network Management Standards.
- Network Management Models.
- Organization Model.
- Information Model.
- Communication Model.
- Functional Model.
- Abstract Syntax Notation One: ASN.1.
- Encoding Structure.

4. SNMPv1 Network Management (Ch. 4-5) (2 Weeks)

- History of SNMP Management.
- Internet Organizations and Standards.
- SNMP Model.
- Organization and Information Models.
- Communication and Functional Models.

5. SNMP Management: SNMPv2 (Ch. 6) (2 Weeks)

- Major Changes in SNMPv2.
- SNMPv2 System Architecture.
- SNMPv2 Structure of Management Information.
- SNMPv2 Management Information Base.
- SNMPv2 Protocol.

- 6. SNMP Management: SNMPv3 (Ch. 7) (1 Week)**
- SNMPv3 Key Features.
 - SNMPv3 Documentation Architecture.
 - SNMPv3 Applications.
 - SNMPv3 Management Information Base.
 - SNMPv3 User-based Security Model.
 - Access Control.
- 7. SNMP Management: RMON (Ch. 8) (1 Week)**
- Remote Monitoring.
 - RMON SMI and MIB.
 - RMON1.
 - RMON2.
 - A Case Study on Internet Traffic.
- 8. Network Management Tools and Systems (Ch. 12) (1 Week)**
- Network Management Tools.
 - Network Statistics Measurement Systems.
 - Network Management Systems.
- 9. Network Management Applications (Ch. 13) (1 Week)**
- Configuration Management.
 - Fault Management.
 - Performance Management.
 - Event Correlation Techniques.
 - Security Management.
 - Accounting Management.
 - Reports Management.
 - Policy Based Management.
- 10. Web-Based Management (Ch. 14) (1 Week)**
- Web Interface SNMP Management.
 - Embedded Web-Based Management.
 - Desktop Management Interface.
 - Web-Based Enterprise Management.
 - Java Management API.
- 11. TMN and ATM Network Management (Ch. 9&11) (1 Week)**
- Telecommunications Management Network (TMN) Conceptual Model.
 - TMN Standards.
 - TMN Architecture.
 - ATM Network Management.
- 12. Projects Presentations (1 Week)**
- More details will be posted on the course web site about the projects.