

King Fahd University of Petroleum and Minerals
College of Computer Sciences and Engineering
Department of Computer Engineering

COE 444 Internetwork Design and Management (3-0-3)

Instructor: Dr. Marwan Abu-Amara
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Term: 132 (2nd term 2013–2014)
Day & Time: MW 12:45 PM – 02:00 PM
Prerequisite: COE 344 (Computer Networks)
Textbook: *Top-Down Network Design*, P. Oppenheimer, Cisco Press, 3rd Edition, 2010.
Office Hours: MW 11:15 AM – 12:00 PM or by appointment
Web Site: <http://faculty.kfupm.edu.sa/COE/marwan>

Catalog Description:

Types of computer networks. Principles of internetworking. The network development life cycle. Network analysis and design methodology. Internetworking hardware. Connectionless internetworking. Connection-oriented internetworking. Routing strategies. Structured wiring and backbone design. OSI internetworking. Network management (SNMP). Network security and firewalls. Network administration. Case studies.

Tentative Grading Policy:

- Homeworks & Quizzes **15%**
- Project **20%**
- Major Exam I **20%** (Week 07 - Wednesday March 12, 2014, 12:45 PM)
- Major Exam II **20%** (Week 13 - Wednesday April 30, 2014, 12:45 PM)
- Final Exam **25%** (*Comprehensive* – Monday May 26, 2013, 7:00 PM)

IMPORTANT NOTES:

- All KFUPM regulations and standards will be enforced. Attendance will be checked each class. The KFUPM rule pertaining to a DN grade will be strictly enforced (i.e. > **6 absences** will result in a DN grade).
- If you are late to the class for more than 10 minutes (i.e. arrive after 12:55 PM), you will **NOT be allowed to enter** the classroom and you will be considered absent for that class.
- Only university approved/certified excuses will be accepted.
- Use of cell phones and PDAs during class period and during exams is absolutely **prohibited**.
- Homeworks are to be submitted **in class** on the due date during the class period. Late homeworks will **NOT be accepted**.
- You have 48 hours to object to the grade of a homework, a quiz, or a major exam from the end of the class time in which the graded papers have been distributed back. If for some reason you cannot contact me within this period, send me an email requesting an appointment. The email should be sent within the 48-hour time period.
- **NO make up exams**. ALL homeworks and quizzes will be counted towards your grade.
- Final exam is **comprehensive**.

Tentative schedule

Week	Topic
1	<i>Overview of Computer Networks:</i> Types of computer networks. LANs and WANs. Protocols and protocol families. The OSI reference model. The TCP/IP protocol.
2-5	<i>Internetworking:</i> Basic terminology. Principles of internetworking. Types of internetworking devices. Repeaters, hubs, bridges, routers, switches and gateways. Transparent and source-routing bridges. Multilayer switches. VLANs. Routing strategies. Addressing.
6	<i>The Network Development Life Cycle:</i> Network analysis. Network design methodology. Writing of a Request For Proposal (RFP) and quotation analysis. Prototyping/simulation. Implementation.
7-8	<i>Enterprise Network Design:</i> Enterprise Network Design Model. Backbone design concepts. Network security and firewalls. Structured cabling systems. Case studies.
Midterm Vacation (March 23rd, 2014 – March 27th, 2014)	
9	<i>Enterprise Network Design:</i> Enterprise Network Design Model. Backbone design concepts. Network security and firewalls. Structured cabling systems. Case studies.
10-12	<i>Topology design and analysis:</i> Topology design. Network design algorithms. Terminal assignment. Concentrator location. Traffic flow analysis and performance evaluation. Network reliability.
13-14	<i>Network Management:</i> Network management standards & models. ISO Functional areas of management. Network management tools and systems. SNMP architecture & operations. Network administration.
15	<i>Project Presentations:</i> More details will be posted on the course web site about the project.

* Week 1 begins on *January 26, 2014*

Course Learning Outcomes

Course Learning Outcomes	Outcome Indicators and Details
1. Ability to apply knowledge of mathematics, probability, and statistics to model and analyze some network design problems.	Spanning tree IP addressing Traffic flow analysis Performance evaluation Network reliability
2. Ability to analyze and design an enterprise network that meets desired requirements.	Network Development Life Cycle Request for Proposal (RFP) Network Analysis and Design methodology and process Requirement analysis phase Logical design phase (hierarchical model, backbone, redundancy, security, etc) Physical design phase (structured cabling, etc.) Assessment of the design Project and case studies
3. Ability to identify, formulate, and solve network design problems	Network topology design problems Terminal assignment problem Concentrator location problem Project and case studies
4. Ability to use techniques, skills, and modern networking tools necessary for network analysis, design, and management.	Guidelines and best practices for network analysis and design SNMP protocol for managing a network