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

COE 546/CSE 550 Computer Network Design (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 540 and (ICS 431 or Equivalent)) or Consent of Instructor.
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: LANs, VLANs, and WANs. Routing algorithms and routing protocols. The network development life cycle. Network analysis and design methodology. Network design issues: Manageability; Node placement and sizing; Link topology and sizing; Routing; Reliability. Data in support of network design. Structured enterprise network design. Hierarchical tree network design: Terminal assignment; Concentrator location. Mesh topology optimization. Traffic flow analysis. Analysis of loss and delay in networks. Network reliability issues.

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	***Overview of Computer Networks:*** Types of computer networks. LANs and WANs. Protocols and protocol families. The OSI reference model. The TCP/IP protocol.
2-5	***Internetworking:*** 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	***The Network Development Life Cycle:*** Network analysis. Network design methodology. Writing of a Request For Proposal (RFP) and quotation analysis. Prototyping/simulation. Implementation.
7-8	***Enterprise Network Design:*** 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	***Enterprise Network Design:*** Enterprise Network Design Model. Backbone design concepts. Network security and firewalls. Structured cabling systems. Case studies.
10-12	***Topology design and analysis:*** Topology design. Network design algorithms. Terminal assignment. Concentrator location. Traffic flow analysis and performance evaluation. Network reliability.
13-14	***Network Management:*** Network management standards & models. ISO Functional areas of management. Network management tools and systems. SNMP architecture & operations. Network administration.
15	***Project Presentations:*** More details will be posted on the course web site about the project.

* Week 1 begins on ***January 26, 2014***