

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

COE 341 Data and Computer Communications (3-0-3)

Instructor: Dr. Marwan Abu-Amara
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Term: 081 (1st term 2008–2009)
Corequisite: STAT 319 (Probability and Statistics for Engineers and Scientists)
Textbook: *Data and Computer Communication*, William Stallings, Prentice Hall International, 7th Edition, 2004.
Office Hours: SMW 09:30 AM – 10:30 AM (or by appointment)
Web Site: <http://faculty.kfupm.edu.sa/COE/marwan>

Tentative Grading Policy:

- Quizzes **09%** (Each quiz may carry a different weight)
- Homeworks **08%** (Each homework may carry a different weight)
- Essay Assignment **05%**
- Programming Assignment(s) **08%** (Using MATLAB)
- Major Exam I **20%** (Monday November 10, 2008 from 07:00 PM to 09:00 PM)
- Major Exam II **20%** (Saturday December 27, 2008 from 07:00 PM to 09:00 PM)
- Final Exam **30%** (***Comprehensive***)

Tentative schedule:

Week	Topic	Textbook Section
1	Communication Model - Data Communications Networking	1.1, 1.2, & 1.3
2	Protocols (characteristics and functions) and Protocol Architecture (OSI and TCP/IP models)	2.1, 2.2, 2.3 & 2.4
3	Data Transmission (concepts and terminology), Analog and Digital Data Transmission	3.1, 3.2
4	Analog and Digital Data Transmission (continued) – Fourier Series Analysis and Fourier Transform Representation	Fourier Transform (class notes)
5	Transmission Impairments – Nyquist formula and Shannon’s Capacity	3.3 & 3.4
6	Transmission Media: Guided & Wireless	4.1 & 4.2
7	Data Encoding: Digital Data – Digital Signals	5.1
8	Data Encoding: Digital Data – Analog Signals	5.2
9	Data Encoding: Analog Data - Digital Signals, Analog Data – Analog Signal	5.3 & 5.4
10	Data Encoding: Analog Data – Analog Signal (continued)	5.4 & 5.5
11	Asynchronous and synchronous data interface, Error Detection	6.1, 6.2, & 6.3
12	Flow Control (stop-and-wait and sliding window flow) and Error Control	7.1 & 7.2
13	Error Control (continued), HDLC	7.2 & 7.3
14	FDM and Synchronous TDM	8.1 & 8.2
15	Synchronous TDM, ADSL, and Statistical TDM	8.2 & 8.3

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. > **9 absences** will result in a DN grade). *Check your university e-mail regularly for warnings regarding your absences.*
- If you are late to the class for more than 5 minutes (i.e. arrive after 11:05 AM), 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, and should be presented **no later than 1 week** after absence.
- Homeworks are to be submitted **in class** on the due date during the class period. Late homeworks will **NOT be accepted** (i.e. will get 0 credit).
- 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**.

Course Learning Outcomes

Course Learning Outcomes	Outcome Indicators and Details	Assessment Methods and Metrics	Min. Weight	ABET 2000 Criteria
1. Ability to apply knowledge of mathematics to understand basic concepts in communication engineering	Application of : <ul style="list-style-type: none"> • Fourier series and transforms • Spectral power density to understand the following concepts: <ul style="list-style-type: none"> • Absolute and effective bandwidth of signals. • Filtering and band limiting • Modulation and bandwidth requirements 	<ul style="list-style-type: none"> • Assignments • Quizzes • Exams 	15%	A (M)
2. Ability to design basic communication systems, components, and algorithms	The student shall be able to design: <ul style="list-style-type: none"> • Simple communication links using various types of guided and unguided media. • Hardware for generating CRC error detection codes and performing error detection. • Bit stuffing/unstuffing algorithms for HDLC control. • Basic PCM and Delta modulation systems. 	<ul style="list-style-type: none"> • Assignments • Quizzes • Exams 	22%	C (H)
3. Ability to identify, formulate, analyze, and solve basic communication engineering problems	The student shall be able to identify merits and trade offs governing the choices of: <ul style="list-style-type: none"> • Analog and digital transmission techniques. • Various digital encoding schemes, including bandwidth requirements. • Various error and flow control mechanisms in the data link layer. • Various modulation techniques, including bandwidth requirements. • Various guided and unguided transmission media. • Synchronous and asynchronous transmission. • Data rate, signal power, noise level, bandwidth and error rate. 	<ul style="list-style-type: none"> • Assignments • Quizzes • Exams 	22%	E (H)
4. Ability to use programming tools and skills for the simulation, analysis, and design of basic communication systems and components	Matlab or LabVIEW-based programming assignments covering one of the following areas: <ul style="list-style-type: none"> • FFT • Filters • CRC generation and error detection • Generation of digital codes • Modulation and shift keying • PCM and Delta modulation systems • Calculation of bit error rate vs signal to noise ratio curves 	<ul style="list-style-type: none"> • Programming Assignments • Demos 	8%	K (L)
5. Ability to demonstrate self learning skills and aptitudes	A term paper on a selected topic in communications that complements/serves the course.	<ul style="list-style-type: none"> • Term paper • Presentation 	5%	I (L)