

University of Guelph
ENGG*3210 (Communication Systems)
Winter 2013

Instructor: Ayman Elmesalami (Thornbrough, Room #1340)
Email: aelmesal@uoguelph.ca
Office Hours: Monday, 9:30 am or by appointments

Course Description (Colander Description):

This course is an introduction to the fundamentals of data communication and computer networking. The data communication basics will cover signal transmission and signal encoding techniques such as: multiplexing techniques, signaling, encoding and decoding, error detection and recovery, sliding window techniques. Computer networking basics will cover: communication network components and topologies, multiple access design issues and performance analysis, switching, routing, services and applications, and security. The course will also cover the mathematical tools (Fourier transform, etc.) used in signal analysis.

Prerequisite(s): MATH*2130, STAT*2120

Evaluation

<i>Assignments</i>	
• <i>Assignment #1</i>	13%
• <i>Assignment #2</i>	12%
<i>Midterm</i>	
• <i>Last week of February</i>	20%
<i>In-class activities (discussion, quizzes and presentation)</i>	20%
Final Exam	
• <i>Check Registrar Schedule</i>	35%
Total	----- 100%

- **Note (1)** late submissions for assignments are acceptable, but there will be a deduction of marks by 10% for one day late, 25% for two days late, and 50% for three days late. No marks will be given for submissions that are more than three days late. Penalties will only be waived for good reason, at the discretion of the instructor.
- **Note (2)** both *Midterm* and *Final exam* are closed-book.
- **Note (3)** more instructions about the student's presentations will be given in class.

Lecture Topics (Tentative):

- **Introduction to Data Communication.**
- **Protocol Architecture:**
TCP/IP Protocol Architecture, Open Systems Interconnections (OSI)
- **Communications Fundamentals:**
Analog & Digital Signals, Time & Frequency Dominos, Spectrum & Bandwidth, Channel Capacity
- **Transmission Media:**
Unguided Media (Twisted Pair, Coaxial Cables, Optical Fibers), Guided Media (Terrestrial Microwave, Satellite Microwave, Broadcast Radio, Wireless Propagation)
- **Signal Encoding:**
Some Terminologies and comparison between different encoding techniques
- **Digital Data Communication Techniques:**
Asynchronous vs. Synchronous Transmission, Types of errors, Errors detection and correction
- **Data Link Control:**
Flow control, Error control, HDLC
- **Multiplexing:**
Frequency Division Multiplexer (FDM), Time Division Multiplexer (TDM)
- **Local Area Networks (LANs):**
Ethernet, Token ring, and Wireless LANs
- **Wide Area Networks (WANs):**
Circuit and Packet Switching, Frame Relay, ATM, Routing, Congestion Control, cellular wireless
- **Internet Protocols:**
IP, IPv6
- **Network security**

Text Book and references:

- Modern Digital and Analog Communication Systems (Oxford Series in Electrical and Computer Engineering), B. P. Lathi (Author), Zhi Ding (Author)
- Data and Computer Communications, (Pearson Prentice hall), William Stallings (Author)
- Communication Systems, 5th Edition, Simon Haykin (Author)

Comments:

Discussion with fellow students is always encouraged; however assignments answers should be your own. **Plagiarism is not tolerated at the University of Guelph**; awareness of the university and School of Engineering policy on plagiarism is your responsibility. Please do not hesitate to ask a question during lectures if something is unclear. The chances are that you are not the only one who thinks so!

Course examination will be based on material covered in lectures, labs, assignments and text book. Also, you are expected to read around the subject from other text books.