Graduate Program in Telecommunications
George Mason University

TCOM 500: Modern Telecommunication
Section 002 and DL1. Spring 2011

Instructor: Dr. Shyam Pandula
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Teaching Assistant: TBA.

Time and Place: Thursday 7:20 - 10:00 pm. Nguyen Engineering Building, Room 1505.

Office Hours: Monday/Wednesday/Thursday 1:30- 2:30 pm. Nguyen Engineering Building, Room 3253.

Course Objective: The objective of this course is to provide an in-depth introduction to all aspects of modern telecommunications. The course provides a foundation for further study of computer networks and wireless communications.

Distance learning section is offered via the web synchronously using Blackboard and Elluminate Live sessions. Distance learning courses are subject to the same policies as stated in the University catalog for campus-based courses. Please refer to following documents posted on the Blackboard: (a) Elluminate student instructions and (b) Test proctoring and guidelines for distance education.

Required Textbook

Supplementary Textbook

Course Material
Course slides and homework assignments will be distributed via the Blackboard course management system { http://courses.gmu.edu }. Login using your GMU email ID and password.

Homework will be assigned weekly and is due the following week. Late homework assignments will be penalized by 20%.
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Grading
Homework: 15%; Midterm 1: 25%; Midterm 2: 25%; Final Exam: 35%.

Tentative Course Schedule

- Week 1: Jan 27; Chapter 3.
  Data and Signals: Time and frequency domain concepts; analog and digital transmission; channel capacity; transmission impairments.
- Week 2: Feb 3; Chapter 4.
- Week 3: Feb 10; Chapter 5.
  Analog Transmission: Digital and analog modulation techniques. ASK, PSK, FSK, QAM; AM, FM.
- Week 4: Feb 17; Chapter 5.
  Analog Transmission: Cont.
- Week 5: Feb 24
  Midterm Exam 1
- Week 6: Mar 3; Chapter 6.
  Multiplexing: FDM, WDM, TDM; spread spectrum: FHSS, DSSS.
- Week 7: Mar 10; Chapter 7.
  Transmission Media: Guided media; wireless media;
- Week 8: Mar 17
  No Class. Spring break.
- Week 9: Mar 24; Chapter 7 and Hioki Chapter 18.
  Fiber Optics: Refraction and total internal reflection; propagation modes; wavelength division multiplexing.
- Week 10: Mar 31; Chapter 9.
  Telephone and Cable Networks: Digital subscriber line; HFC network for data transmission.
- Week 11: Apr 7
  Midterm Exam 2
- Week 12: Apr 14; Chapter 10.
  Error Detection and Correction: Block coding, Hamming distance; cyclic codes; checksum.
- Week 13: Apr 21; Chapter 16.
  Wireless Communications: Cellular networks; satellite networks
- Week 14: Apr 28; Chapter 2.
  Network Models: OSI model; TCP/IP protocol suite.
- Week 15: May 5; Chapters 30 and 31.
  Cryptography: Symmetric key and asymmetric key cryptography.

  May 12 Final Exam