TCOM 500: Modern Telecommunication  
Section 001. Spring 2011

Instructor: Dr. Shyam Pandula  
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Teaching Assistant: TBA.

Time and Place: Wednesday 4:30 - 7:10 pm. East Building, Room 201.

Office Hours: Monday/Wednesday/Thursday 1:30- 2:30 pm. The 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.

Required Textbook

Supplementary Textbook

Course Material
Course slides and homework assignments will be distributed via the Blackboard course management system { [http://courses.gmu.edu](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%.

Grading
Homework: 15%; Midterm 1: 25%; Midterm 2: 25%; Final Exam: 35%.
Tentative Course Schedule

- Week 1: Jan 26; Chapter 3.
  Data and Signals: Time and frequency domain concepts; analog and digital transmission; channel capacity; transmission impairments.
- Week 2: Feb 2; Chapter 4.
- Week 3: Feb 9; Chapter 5.
  Analog Transmission: Digital and analog modulation techniques. ASK, PSK, FSK, QAM; AM, FM.
- Week 4: Feb 16; Chapter 5.
  Analog Transmission: Cont.
- Week 5: Feb 23
  Midterm Exam 1
- Week 6: Mar 2; Chapter 6.
  Multiplexing: FDM, WDM, TDM; spread spectrum: FHSS, DSSS.
- Week 7: Mar 9; Chapter 7.
  Transmission Media: Guided media; wireless media;
- Week 8: Mar 16
  No Class. Spring break.
- Week 9: Mar 23; Chapter 7 and Hioki Chapter 18.
  Fiber Optics: Refraction and total internal reflection; propagation modes; wavelength division multiplexing.
- Week 10: Mar 30; Chapter 9.
  Telephone and Cable Networks: Digital subscriber line; HFC network for data transmission.
- Week 11: Apr 6
  Midterm Exam 2
- Week 12: Apr 13; Chapter 10.
  Error Detection and Correction: Block coding, Hamming distance; cyclic codes; checksum.
- Week 13: Apr 20; Chapter 16.
  Wireless Communications: Cellular networks; satellite networks
- Week 14: Apr 27; Chapter 2.
  Network Models: OSI model; TCP/IP protocol suite.
- Week 15: May 4; Chapters 30 and 31.
  Cryptography: Symmetric key and asymmetric key cryptography.

- May 11 Final Exam