DIGN310B – Digital Communications

Instructor: Dr. Yufei Wu
Class Schedule: Tuesday and Thursday. 10:00 – 12:00 a.m.
Location: Seminar Room 6
Lab time/location: TBD
Office Hours: 12:00 a.m.–6:00 p.m. everyday or by appointment
E-mail: EMAIL (caribbean@inbox.com)
Course URL: www.u.tt/ict

Course Description

Modern digital communication systems are the backbone of today's Information Superhighway. Advance signal processing techniques play an increasingly important role in communication systems. This course is an introduction to the fundamental principles underlying the design and analysis of communication systems including theoretical and experimental design aspects of communication systems

Prerequisite: Signal Analysis, Probability Theory.

Assessment

Assignments 16 %
Labs 24 %
Midterm Exam 20 %
Final Exam 40 %

- **Reference Material,**
  - Communication Systems, 4th edition, Simon Haykin
  - Modern Digital and Analog Communication Systems, 3rd edition, B. P. Lathi
  - Communication Systems Engineering, 2nd edition, John G. Proakis

Course Schedule

Date	Topics
Week 1 (January 12 – 16)	Introduction to Signal (useful signal operations, useful functions, correlation)
Week 2 (January 19 – 23)	Probability and Random Process
Week 3 (January 26 – 30)	Sampling and PCM, line coding and pulse shaping
Week 4 (February 2 – 6)	Baseband Pulse Transmission (matched filter, error rate due to noise, intersymbol interference, Nyquist criterion)
Week 5 (February 9 – 13)	Baseband Pulse Transmission (Nyquist Criterion, baseband M-ary PAM transmission, optimum linear receiver, adaptive equalization)
Week 6 (February 16 – 20)	Signal Space Analysis
Week 7 (February 23 – 27)	Passband Digital Transmission (passband transmission model, PSK, FSK)
Week 8 (March 2 – 6)	Passband Digital Transmission (signal design)
Week 9 (March 9 – 13)	Passband Digital Transmission (signal detection)
Week 10 (March 16 – 20)	Spread Spectrum Modulation

Week 11 (March 23 – 27)	Information Theory
Week 12 (March 30 – April 3)	Error Control Coding