ESE 342
Digital Communications Systems
Spring 2011

Instructor: **Mónica Fernández-Bugallo** *Office Hours:*
Light Engineering, Room 245 MW 9:30 AM - 11:30 AM
email: monica@ece.sunysb.edu or by appointment

Class Meetings: MW 8:05-9:25 AM
Location: MARIACHI Lab/Nuclear Structure Lab, Basement of Physics building

Grading: Exercises and lab projects: 30%
Four quizes: 20% (best of the two first quizes), 20% (second quiz), 30% (third quiz)

Prerequisites: ESE 340: Basic Communication Theory
ESE 305: Deterministic Signals and Systems
ESE 306: Random Signals and Systems

Textbook: B. Sklar, *Digital Communications: Fundamentals and Applications*, Prentice-Hall, 2001.

Class resources: http://blackboard.stonybrook.edu

It is the student responsibility to plan his semester avoiding exam conflicts and too many exams in the same day.

If you have a physical, psychological or learning disability that may impact on your ability to carry out assigned course work, I would urge that you contact the staff in the Disabled Student Services office (DSS), room 133 Humanities, 632-6748/TDD.

Topics:

- Signals and Spectra. (Ch. 1)
    - Elements of a Digital communication System.
    - Classification of Signals.
    - Signal Transmission through Linear Systems.
- Digital Baseband Modulation and Demodulation/Detection. (Ch. 2 and 3)
    - Formatting Analog Information: The Sampling Theorem.
    - Pulse code Modulation.
    - Detection of Baseband Signals in Gaussian Noise.
    - Transmission Through Bandlimited Channels
    - Equalization.
- Digital Bandpass Modulation and Demodulation/Detection. (Ch. 4)
    - Representation of Bandpass Signals: Equivalent Low-Pass Signal.
    - Digital Bandpass Modulation Techniques.
    - Detection of Bandpass Signals in Gaussian Noise.
    - Coherent and Noncoherent Detection.
    - Error Performance for Binary Systems.
- Error Control Coding. (Ch. 6 and 7)
    - Types of Error Control.
    - Linear Block Codes.
    - Other Coding Schemes: Cyclic Codes, Convolutional Codes.
- Digital Networks. (Other books)
    - Network Topologies.
    - Access Protocols.
    - Circuit and Package Switching.