1011-94-59 **Thomas E Fuja*** (tfuja@nd.edu), Department of Electrical Engineering, 275 Fitzpatrick Hall, University of Notre Dame, Notre Dame, IN 46556. *Communication Channel Models and Their Implications for Error Control.*

This talk will develop discrete-time probabilistic models for digital communication channels and describe how different channel models motivate different criteria by which error control codes and coded modulation schemes are judged. The talk will proceed from the simplest models — binary input channels that are "memoryless" — to more complex (and realistic) channel models that accommodate bandwidth-efficient modulation and that describe impairments (such as fading) in which correlation (or "memory") plays an important role. The design and analysis of error control codes for these more sophisticated channel models will be discussed — including recent work on the design of low-density parity check (LDPC) codes for fading channels. Two competing approaches to this problem will be articulated; the first uses the LDPC structure to iteratively estimate channel parameters and decode data, while the second proposes the use of LDPC codes and conventional message passing decoding as a "universal" scheme that provides good performance over a broad range of channel parameters. (Received August 09, 2005)