

**COMMONWEALTH GRADUATE ENGINEERING PROGRAM
TELEVISED COURSE PLANNING SHEET
UNIVERSITY OF VIRGINIA**

Course ECE 712 – Digital Communications Semester Spring 2004

Instructor Maité Brandt-Pearce Phone No. 434-924-1470

Office Address University of Virginia; Dept. of Electrical and Computer Engineering; Thornton C322;
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Textbook(s): (Student to purchase)

Digital Modulation and Coding, by S. G. Wilson, Prentice Hall (1996) ISBN 0-13-210071-1

Reference(s): (To be put on library reserve) - Limit 4

Digital Communications, by J. G. Proakis

Digital Communication, by E. A. Lee and D. G. Messerschmitt

Computer Needs:

Microcomputer
Capability _____

Software required? _____ Provided? _____

Other _____

Course syllabus and instructor bio are attached.

**School of Engineering and Applied Science
Department of Electrical and Computer Engineering**

**ECE 712 – Digital Communications
Spring 2004**

Prerequisites:

Introduction to analog and digital communications, signals and systems, probability and stochastic processes.

Course Description:

In this course you will study the fundamental aspects of digital transmission, as applied to radio, optical, satellite, and wireless transmission media. Specific topics include channel models, digital modulation and detection, power spectrum, error performance analysis versus signal-to-noise ratio (SNR), error control coding (both block and trellis coding), equalization, and synchronization. The course deals with “physical layer” issues, and is not a course which covers networking or multiple access in significant detail.

Textbook:

Digital Modulation and Coding, by S. G. Wilson, Prentice Hall, 1996 (ISBN 0-13-210071-1).

Additional References:

Digital Communications, by J. G. Proakis

Digital Communication by E. A. Lee and D. G. Messerschmitt.

Instructor:

Dr. Maïté Brandt-Pearce, Associate Professor of Electrical and Computer Engineering.

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Office Hours: Tuesdays and Thursdays 2:00 -3:00pm.

Grading:

Homeworks	25%
Midterm exam	35%
Final exam	40%
	100%

The exams are pledged. The homeworks are not pledged. You are encouraged to work in groups on the weekly homeworks; however, your work must be your own. Identical papers will be given zeros.

Tentative Course Outline:

- Intro and background
- Modulation and detection
 - Midterm
- Equalization and synchronization
- Error-control Coding
- Special topics
 - Final

Maite Brandt-Pearce

Maite Brandt-Pearce received the B.S. in Electrical Engineering and the B.A. in Applied Mathematics from Rice University in 1985, followed by the M.E.E. in 1989. She joined the faculty at UVA after completing her Ph.D. in Electrical Engineering also from Rice University in 1993. Dr. Brandt-Pearce has served on the faculty since 1993 and previously worked for four years at the Lockheed ECS in support of the NASA Johnson Space Center. She has received a National Science Foundation Research Initiation Award, an ORAU Junior Faculty Enhancement Award, and a NASA Graduate Student Researcher Fellowship. She is a member of IEEE and the honorary societies Tau Beta Pi and Eta Kappa Nu.

Maite Brandt-Pearce's fundamental interest lies in deciphering stochastic signals with multiple, simultaneously received components from different sources, including co-channel interference, linear and nonlinear distortion, and noise. Specific research projects address spread-spectrum multiple-access schemes, multi-user demodulation and detection, fiber nonlinearity effects on multi-user communications, wireless infrared indoor multi-user communications, and radar signal processing of multiple targets. Secondary interests include the study of point processes, neural networks, and the use of communications for classroom enhancement.

Research:

All-optical Code-division Multiple-access Communication Systems (funded by: National Science Foundation)

Space-Time Coding for Optical MIMO Channels (funded by: NSF)