CHAPTER 1

THE DEVELOPMENT OF DIGITAL NETWORKS

CHAPTER 2

BASEBAND DIGITAL TRANSMISSION SIGNALS

CHAPTER 3

INTERSYMBOL ITERFERENCE AND PULSE SHAPING

CHAPTER 6

DIGITAL RADIO SYSTEMS

CHAPTER 7

COMPUTER NETWORKS

CHAPTER 8

ERROR CONTROL IN DIGITAL NETWORKS

CHAPTER 9

DIGITAL SWITCHING

CHAPTER 10

DIGITAL CODING OF VOICE AND TELEVISION SIGNALS

ATTACHMENT 'A'
(continued)

BASIC DIGITAL TRANSMISSION SYSTEM THEORY
COURSE OUTLINE

1. Linear Systems Dr K.C. Ng (Monash) 7 Lectures

   Time domain and frequency domain, analysis of linear systems, including convolution and Fourier Transform. Application to Digital Transmission Systems.

2. Random Processes Dr K.K. Pang (Monash) 7 Lectures

   Basic probability theory, random time processes including auto-correlation and power spectrum. Response of transmission systems to random inputs.

3. Digital Transmission Dr D.B. Keogh (Monash) 9 Lectures

   Fundamentals.
   Linear representation of digital signals. Bandlimiting, inter-symbol interference. Nyquist pulse shaping, roll-off. Average power spectral density of digital signals. Error probability formula for multilevel digital signals.

   Line Coding.
   Rationale. Examples - conditional diphase, AMI and HDB3. Physical description, average power spectral density.

   Modulated digital signals.
   Rationale. Examples, linear - digital Am (DSBAM, DSBAMSC, WAM, PM: VSBAM, SSBAM). Examples, nonlinear - digital FM. Time and frequency domain representations. Phase jitter tolerance. Application of baseband error probability formula to modulated digital signals.

4. Applications Dr A. Jennings and Messrs A. Martin & G. Nicholson (Telecom) 5 Lectures

   Baseband transmission in pair cable.
   Effect of impulse noise and compatibility with other services on a 4800 bit/s DNN signal. 2048 kbit/s line systems - crosstalk into similar systems, noise figure.

   Data-in-Voice (DIV) performance.
   2048 kbit/s DIV transmission in 2 or 3 contiguous super-groups between Melbourne and Sydney.

   Digital Radio.
   Example based on 140 Mbit/s digital radio system.
   Introduction single hop system design for flat fading, effect of frequency selective fading.
   Optical Fibre Systems
   Example based on 140 Mbit/s system.
   Noise processes, regenerator section length design.

5. Summing up and Review

   General course revision and course evaluation.