## UNIVERSITY OF TEXAS AT DALLAS Department of Electrical Engineering

## *EE/TE 4367* - Telecommunications Switching & Transmission Assignment #7

Date assigned:	3/27/2008
Date due:	4/3/2008

**5.1** Determine the attenuation  $\alpha$  in decibels per kilometer such that the loss limit of a 500-Mbps fiber system is exactly equal to the dispersion limit. Assume the transmitter output is 30 dB above the receiver threshold for the desired error rate and that the system has a BDP of 80 Gbps-km.

## 5.2

<b>Optical Source</b>			
Device Type	Wavelength (nm)	Launched Output	FWHM Spectrum
		Power (dBm)	Width (nm)
Si LED	850	-16	50

<b>Optical Detector</b>			
Device Type	Wavelength (nm)	Launched Output	Data Rate (Mbps)
		Power (dBm)	
Si p-i-n	850	-48	50

A 850-nm, graded-index, single-mode, 50 Mbps fiber system with 2 dB/km loss in the fiber is to be used for a token-passing bus local area network. Assume the system uses the source-detector pair above. The BDP of the fiber is 500 Mbps-km. What is the total loss margin (or budget) of the system? Find the distance limit of the system. How many passive taps with 0.5 dB of loss can be inserted per kilometer without affecting the distance between transmitter and receiver?

5.3 What is the minimum and maximum pulse density of mB1p and mB1C line codes?