

EE3700 - Communication I

Tutorial 8 Spread Spectrum Techniques 2

- 1 A data stream at 100 kbit per second needs to be transmitted. It is proposed to transmit this using CDMA. For the system a process gain of 64 is required and error correction for the data is applied using a $\frac{3}{4}$ convolutional code. What is the chip rate required and what bandwidth does the resulting CDMA signal have?
- 2 Sketch the transmitted spectrum.
- 3 How many other users can access the same spectrum using the same system.
- 4 If the same system, (same data rate, same error correction and the same number of users) is transmitted using a COFDM modulation using QPSK, what is the bandwidth required. For the COFDM system, root raised cosine filtering with $\alpha = 0.35$ is applied and a bandwidth of 1.2 times the ideal bandwidth can be assumed.
- 5 If the modulation for the system in part 4 is changed to 64 QAM, what bandwidth is required.