

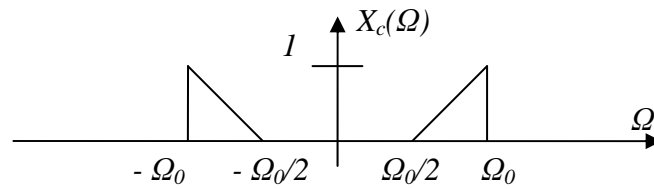
University of California, Berkeley
Department of Electrical Engineering and Computer Sciences
EE123: DIGITAL SIGNAL PROCESSING

Fall 2006

Discussion #11

1. Sampling
 - a. Sampling of continuous-time signals
 - b. Reconstruction of sampled signals
 - c. DT processing of CT signals

2. A continuous-time signal $x_c(t)$, with Fourier transform $X_c(\Omega)$ shown below, is sampled with sampling period $T=2\pi/\Omega_0$ to form the sequence $x[n]=x_c(nT)$.



- Sketch the Fourier transform $X(\omega)$ for $|\omega| < \pi$.
- The signal $x[n]$ is to be transmitted across a digital channel. At the receiver, the original signal $x_c(t)$ must be recovered. Draw a block diagram of the recovery system and specify its characteristics. Assume that ideal filters are available.
- In terms of Ω_0 , for which range of values of T can $x_c(t)$ be recovered from $x[n]$?