**EC4910: Project 7**

**WiMax Signal Demodulation**

**Description.**

In this project we design a system to detect and demodulate a WiMax signal. The OFDM parameters are as we introduced in class, with the FFT length N=256, the Cyclic Prefix length L=64 and null subcarriers to provide a frequency guard to prevent interference with other users.

For this project the Matlab file *project7.mat* contains two data vectors, both complex: *received\_data* and *Xp256*. While *received \_data* contains baseband data at the receiver, *Xp256* is the fft of the second preamble.

In order not to spend too much time on programming and testing, it would e easier to do this project in Matlab, rather then Simulink.

**Problem 1: Time Synchronization**

By autocorrelation of the received data and crosscorrelation of the received data with the preamble, estimate where the data to be demodulated begins. Just determine the starting point visually from the graphs.

**Problem 2: Frequency Response Estimation**

Separate the received preamble from the received data. From the received preamble determine the frequency response of the channel.

**Problem 3: Demodulation of the Data**

From the received data and the frequency response of the channel, demodulate the data. Plot what the result and verify that the data transmitted is coded as 16QAM.