ABSTRACT

At this time, highly developed information technology in wireless data transmission. The latest technology was created to meet the need for faster data access, powerful and wide-reaching. Technology *Worldwide Interoperability for Microwave Access* (WiMAX) is the latest wireless access technology, where the technology offers the speed and the ability to access the range of fairly distant, which can reach 100Mbps in the range of 10 km. Able to handle many functions such offering high-speed internet, phone services, data transformation, video streaming and other devices that support IEEE 802.16 WiMAX broadband standard.

Orthogonal Frequency-Division Multiplexing (OFDM) is a method of access is used or applied on Wimax. OFDM has become the preferred modulation scheme for spectral efficiency and more resistant to a variety of disorders. Although the components and overall structure of different OFDM protocols are functionally similar. In this final project will implement *Reed-Solomon Encoder* and *Decoder* in WiMAX 802.16 technology using *Field Programmable Gate Array* (FPGA) with language *VHSIC Hardware Description Language* (VHDL) and the simulation will be done using Modelsim software and the results will be verified with MATLAB software.

Final result is a design that will be implemented on the FPGA to realize the signal is simulated in Modelsim and prove that *Reed-Solomon Encoder* input signal at the transmitter output will correspond to the *Decoder* at the receiver *Reed-Solomon*. And the results come out of each experiment (simulation and implementation) will be compared if the simulation output will be equal to the output of the FPGA implementation. The design will be synthesized using ALTERA FPGA DEO-NANO family Cyclone IV E (chipset EP4CE22F17C6).

Keywords: Wimax, FPGA, VHDL, *Reed-Solomon Encoder, Reed-Solomon Decoder.*