## **ABSTRACT**

Nowadays as the development of various technologies that try to make an easier way for humans to be a trend that continues to be pursued by various researchers to provide the best quality service. One of them is the proliferation of WBAN (Wireless Body Area Network) technology that allows the interaction between the human body with a certain electromagnetic devices. Now, one of the curious thing that have been developed is made of a body worn antenna which is realized by utilizing a flexible material so that it can be used safely by humans. WBAN can be applied into an application which using body worn antenna that can be integrated with a particular device is implemented in the health field as a medical application that collects data such as the condition of the patients heart rate, respiratory rate, or oxygen levels in the blood.

In this final project designed a bodyworn antenna that can be implemented using a flexible material in the human body ,so it can be applied in the WBAN communication that one of them could be a data transceiver device in monitoring the health condition of the body . Antenna is designed using strip monopole antenna at a frequency of 2.45 GHz using a substrate hypafix plaster . For the design of the patch and the groundplane using copper material with a flexible tape that can be attached to the skin surface of the human body . The design of the antenna is simulated using Computer Simulation Technology (CST) Microwave Studio .

At the end of this final project performed a comparison between the measurements of antenna parameters and conditions of free space in the body at a frequency of 2.45 GHz which has a gain of  $\geq$  2.5 dB and has a VSWR < 1.5 with unidirectional radiation pattern . We measured antenna parameters on some parts of the body , found that the antenna works approaching the desired specifications when placed on the hand . Meanwhile obtained through simulation results that in order to obtain a positive gain antenna should be placed at least at a distance of 6 mm from the body . The simulation Specific Absorption Ratio calculation (SAR) SAR values  $\leq$  1.6 W/kg .

Keywords: Bodyworn Antenna, Strip Monopole Antenna, WBAN.