

## ABSTRACT

Osteoporosis is a condition or disease of the bones that causes them to become brittle and easily fractured or broken. The tool used to measure bone density using ultrasound in the heel area is considered to be less accurate, as it is only used for screening and further brought to Bone Mineral Density (BMD) for diagnosis. Another examination is done using bone markers located within the blood. This examination is not intended for diagnosing osteoporosis but rather for monitoring the success of treatment.

Based on the issue above, in this Final Project (FP), a osteoporosis detector in the form of a circular microstrip patch antenna with Industrial, Scientific, and Medical (ISM) frequency working at 5,8 GHz, using FR-4 material for the substrate, and copper tape for groundplane and patch, will be tested on cow bones as a substitute for the human body using the microstrip feedline technique.

The antenna is designed using CST software with an analysis comparing the specifications of Return Loss, bandwidth, gain, VSWR, and initial radiation pattern from the simulation design to the realization of the desired specifications. The direct testing result of the antenna at the operating frequency of 5,8 GHz showed a Return Loss of -33,93 dB, VSWR value of 1,05, bandwidth of 269 MHz, and unidirectional radiation pattern. The antenna in this study can be used effectively as it meets the expected specifications.

**Keywords :** *Osteoporosis, Antenna Mikrostrip, Narrowband, Frequency*