

## **ABSTRACT**

*Management on frequency resources as limited resources in world countries become the background in today's wireless development. Cognitive radio come as the answer for spectrum frequency management problem according to specific time and place. Study on cognitive radio in several countries is started by unefficient use for several lisenze spectrum based by time and frequencies. This final year project will measure how is the value of spectrum occupancy for GSM 1800 MHz as GSM frequency which mostly used for mobile communication. Scenario used in this final year project will be based on measurement time and frequency span.*

*Measurement is done by placing antenna worked as receiver for specific frequencies to be connected for spectrum analyzer to be detected on usage and then connected to the computer and recorded for a week by sampling it every 15 minutes. From those result, the data will then counted using Microsoft Excel by using energy detection methode which will count the whole usage percentage within sampling time. The result from this measurement is percentage value from frequency used which then called as duty cycle.*

*As a result, total duty cycle is around 15,48% with spectrum usage for downlink only 0,05% and uplink 31,1%. From those amount, it is stated thaat the duty cycle only effective for 23,22 MHz.*

**Keywords:** *cognitive radio, spectrum occupancy, frekuensi, energy detection, duty cycle.*