

## ABSTRACT

*The limitation frequency allocation is one of the factors hampering the increase in LTE-Advanced services. One way to improve LTE-Advanced services is to use the Carrier Aggregation (CA) technique, which serves to increase high throughput values with good frequency allocation. This Undergraduate Thesis simulates the CA technique using Atoll software.*

*This Undergraduate Thesis designs CA techniques using 20 MHz bandwidth in urban areas with a coverage and capacity approach on the 4G 3GPP Release 12 network, 3GPP Release 10, and non-CA 3GPP Release 8 techniques. In 3GPP Release 12, this Undergraduate Thesis designs TDD-FDD with a frequency of 2300 MHz, while at 3GPP Release 10 FDD-FDD with a frequency of 900 MHz and 1800 MHz.*

*This Undergraduate Thesis simulates CA 3GPP Release 12 technology, 3GPP Release 10, and non-CA 3GPP Release 8 techniques to improve LTE-Advanced performance. The results of this Undergraduate Thesis indicate that CA technology can significantly increase the value of throughput. The results of this Undergraduate Thesis also show that the best CA technology is to use the FDD-FDD method on 3GPP Release 10, using a frequency of 900 MHz as a primary cell and 1800 MHz as a secondary cell in terms of throughput parameters. Undergraduate Thesis also presents the results of the simulation parameters Reference Signal Received Power (RSRP) and Signal to Interference and Noise Ratio (SINR).*

***Keywords: LTE-Advanced, 3GPP Release 12, 3GPP Release 10, Carrier aggregation, Frequency of Work, FDD-FDD CA, TDD-FDD CA***