# ABSTRACT

Optimization plays important role in a process to avoid waste; specifically waste of time and efforts**.** As for electrochemical machining (ECM) optimization can be done through optimizing its parameters such as voltage and electrolyte (NaCl) concentration. The goal of this optimization is to result the highest value of material removal rate (MRR) and the lowest overcut (OC).

The research is conducted by varying 3 levels of voltage (9.5, 11 and 12.5 volts), 3 levels of NaCl concentration (100 g/L, 150 g/L and 200 g/L) and 3 times the replication of full factorial design approach (FF). Machining was done by using die sinking method with stainless steel 204 electrode and workpiece material stainless steel 204.

The results obtained from this research that voltage and NaCl concentration have significant influence on the value of MRR and overcut, where its influence is encapsulated in form of linear regression models. Besides that, the highest MRR obtained at voltage of 12.5 volts and NaCl concentration 200 g/L with value 17.86 $\times 10^{-4}$ g/s, while for the lowest overcut obtained at voltage of 9.5 volts and NaCl concentration 9.5 g/L. As for the overcut, the lowest value of overcut is gained through the combination of 9.5 volts and 100 g/L NaCl concentration with overcut value 0.032 mm. Thus, greater level of factors will result in greater MRR, and lower level of factors will result in lower overcut

**Keywords -** Material removal rate, overcut, electrochemical, full factorial design, regression.