# ABSTRAK

Skripsi ini membahas tentang pemodelan matematis dinamika populasi geng kriminal serta penyelesaian numerisnya dengan metode Milne. Populasi geng kriminal dibedakan berdasarkan rentang usia yaitu usia $(0-7)$ tahun, usia $(8-17)$ tahun dan usia $(18-\text{ke atas})$ tahun. Model matematis disajikan dalam bentuk persamaan diferensial nonlinear orde satu. Model tersebut diselesaikan menggunakan metode Milne dibantu dengan metode Runge Kutta orde empat untuk menyelesaikan masalah nilai awal. Model matematis untuk dinamika populasi geng kriminal yaitu, *Susceptible Population* $(S_1, S_2, S_3)$, *Gang Population* $(G_1, G_2, G_3)$ dan *Correctional Center Population* $(C_1, C_2, C_3)$. Skripsi ini juga memperhatikan bilangan reproduksi dasar $Re$ yaitu apabila $Re < 1$ maka populasi geng kriminal akan berkurang. Sedangkan jika $Re > 1$ maka populasi geng kriminal akan bertambah dan tetap ada.

**Kata kunci:** *Populasi geng kriminal, model matematis, metode Milne*.

# ABSTACT

This thesis discusses the mathematical modeling of population dynamics of criminal gangs and their numerical solutions based on the Milne method. The population of criminal gangs is compartemented based on age ranges, $(0-7)$ years, $(8-17)$ years and, $(18-\text{above})$ years. The mathematical model is presented as a system of first-order nonlinear differential equations. It is solved using the Milne method assisted by the fourth-order Runge Kutta method to solve the initial value problem the mathematical model for the dynamics of the criminal gang population involves Susceptible Population $(S_1, S_2, S_3)$, Gang Population $(G_1, G_2, G_3)$, and Correctional Center Population $(C_1, C_2, C_3)$. This thesis also considers the primary reproduction number $Re$ that is, if $Re < 1$ then the population of criminal gangs will decrease. If $Re > 1$, then the population of criminal gangs will increase and remain.

**Keywords:** Criminal gang population, mathematical model, Milne's method