1161-94-241 **Dalton Seth Gannon*** (dalton.gannon@louisville.edu), 1124 Reutlinger Ave, Apt 204, Louisville, KY 40204, and **Hamid Kulosman**. *LCD codes and the condition for cyclic codes over $\mathbb{Z}_4$ to be LCD.*

A linear code with complementary dual (LCD code) is a linear code C whose intersection with its dual code, $C^{\perp}$, is only the zero codeword (i.e. $C \cap C^{\perp} = \{0\}$). These codes are of importance for not only theory, but for application as well. LCD codes give an optimum linear coding solution for a two user binary adder channel, they have applications to data storage, they simplify the maximum-likelihood decoding problem, and these codes have recently been shown to have applications to cryptography. It was first shown by James Massey a condition of linear codes to have complementary dual. Later, Yang & Massey produced a condition for a cyclic code over a Galios Field to have a complementary dual. It will be shown that a necessary and sufficient condition for a cyclic code C over $\mathbb{Z}_4$ of odd length N to be an LCD code is that $C = (f(x))$, where f is a self-reciporocal monic divisor of $X^N - 1 \in \mathbb{Z}_4[X]$. This result provides an interesting likeness between LCD cyclic codes over Galios Fields and LCD cyclic codes over the ring $\mathbb{Z}_4$. (Received August 17, 2020)