

## The Binary Linear Codes of Mathieu Group

Vincent Nyongesa Marani<sup>1</sup>, Lucy Chikama<sup>2</sup> & Prof. Shem Aywa<sup>3</sup>

1,2,3-Kibabii University

Corresponding e-mail:

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### **Abstract**

*We use coding theory to study the internal structure of simple groups. Coding theory deals with methods of constructing and analyzing error-correcting codes. In this paper, we construct all binary linear codes from  $M_{23}$  and determine their properties. We link these codes to designs and graphs. We develop the algorithm that determine these codes and add the algorithm to the Magma software.*

*Mathematics Subject Classification: 05B05, 20D45, 94B05*

**Key words:** *Binary codes, designs and Modules.*