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**Project Information**

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| **Title of the Project** |
| Sustainable Geopolymer Mortars Incorporating Basalt Fiber, Nanosilica, and Industrial Waste Materials. |
| **Project Description** |
| This project aims to investigate and develop high-performance geopolymer mortars by incorporating basalt fiber, nanosilica, and polypropylene fiber into the mix. Geopolymer mortars are known for their sustainability and durability, making them a promising alternative to traditional cement-based mortars. By reinforcing them with basalt fiber for enhanced strength and toughness, adding nanosilica to improve microstructural properties, and incorporating polypropylene fiber to reduce cracking and enhance ductility, this research seeks to optimize the composition of geopolymer mortars for various civil engineering applications. |

**Project’s Supervisor**

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| Name | Mr. Twana | E-mail |  |

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| **Project Justification/Characteristics** | |
| New Aspects/  Challenging Problems and Issues (if any) | Optimizing the combination of basalt fiber, nanosilica, and polypropylene fiber in geopolymer mortars to achieve a balance between mechanical properties and durability.  Assessing the compatibility of these materials within the geopolymer matrix.  Investigating the long-term performance and resistance to environmental factors |
| Related Civil Engineering Science Fields and Subfields | * Materials Engineering: Focuses on the selection and enhancement of construction materials, including innovative approaches like geopolymer mortars. * Structural Engineering: Addresses the implications of improved geopolymer mortars in terms of structural design and stability. * Construction Engineering and Management: Considers the practical applications and feasibility of using these enhanced mortars in construction projects. |
| Tools | Laboratory equipment for mortar preparation and testing, including mixers, molds, and compression/flexural testing machines. |
| Labs Needed for this Project | Concrete Lab. |