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**Project Information**

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| **Title of the Project** |
| Geopolymer Mortars Reinforced with Basalt Fiber and Improved by Nanosilica and Polypropylene Fiber |
| **Project Description** |
| This project aims to enhance the performance of geopolymer mortars, a sustainable alternative to conventional cement-based mortars, by incorporating three key materials: basalt fiber, nanosilica, and polypropylene fiber. Geopolymer mortars are known for their environmental benefits and durability, making them attractive for various civil engineering applications. By reinforcing them with basalt fiber to improve mechanical properties, adding nanosilica to enhance microstructural characteristics, and introducing polypropylene fiber to control cracking and enhance ductility, this research seeks to optimize the composition and properties of geopolymer mortars for practical use in construction and infrastructure projects. |

**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) | * Investigating the compatibility of basalt fiber, nanosilica, and polypropylene fiber within the geopolymer matrix, considering their differing physical and chemical properties.
* Achieving the right balance between improved mechanical strength, durability, and workability of the geopolymer mortars.
* Assessing the long-term performance, including resistance to environmental factors and compatibility with various construction scenarios.
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| Related Civil Engineering Science Fields and Subfields | * Materials Engineering: Focuses on the development and characterization of construction materials, including innovative materials like geopolymer mortars.
* Structural Engineering: Examines the implications of enhanced geopolymer mortars on the design and stability of structures.
* Construction Engineering and Management: Considers the practical applications, feasibility, and cost-effectiveness of using optimized geopolymer mortars in construction projects.
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| Tools | Laboratory equipment for mixing, curing, and testing geopolymer mortar specimens, including mixers, molds, and compression/flexural testing machines. |
| Labs Needed for this Project | Concrete Lab |