

I-STEM Software Request - Guide Approval Form

User Details

- **Name of Researcher:** Angel Mary Joshy
- **User Type:** Masters
- **Institution Name** : Mar Athanasius College of Engineering, Kothamangalam
- **Institutional Contact No:** 9656283263
- **Research Topic:** Experimental and Numerical Investigation of Mechanical and Electromagnetic Shielding Performance of Nano-ZnO Modified Cement-Based Composites

Software Request Details

- **Software Name:** COMSOL Multiphysics software
- **Justification for Software Request:** The proposed research titled "Experimental and Numerical Investigation of Mechanical and Electromagnetic Shielding Performance of Nano-ZnO Modified Cement-Based Composites" involves numerical simulation of electromagnetic wave interaction, attenuation mechanisms, and shielding effectiveness in heterogeneous cementitious composites incorporating nano-ZnO and hybrid fillers. Accurate modelling of dielectric loss, magnetic loss, electrical conductivity, and field interactions in such multiphase materials requires advanced multiphysics-based simulation beyond conventional analytical approaches. COMSOL Multiphysics, with its RF and AC/DC Modules, is particularly suited for this study due to its strong capabilities in electromagnetic wave propagation, frequency-domain analysis, evaluation of electric and magnetic field distributions, current density, and power loss within complex material systems, along with seamless multiphysics coupling. The software enables realistic implementation of effective electromagnetic properties obtained from literature and theoretical models, allowing reliable identification of dominant shielding mechanisms such as absorption and reflection. Therefore, access to COMSOL Multiphysics is requested for academic research purposes, as it is essential to ensure the accuracy, reliability, and scientific rigor of the numerical investigations proposed in this study.
- **Guide/Supervisor Approval**
I, Dr. Elson John (Guide/Supervisor Name),
 - Confirm that the above-mentioned researcher is affiliated with our institution
 - Have reviewed the software request and its relevance to the researcher's academic work
 - Approve the software request for research purposes

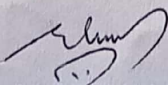
Approval Confirmation

- I approve the software request
- The software aligns with the researcher's research objectives
- The request meets the institutional research guidelines

Guide/Supervisor Signature:

Date: 21/01/2026

Official Stamp/Seal


Dr. ELSON JOHN
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