

I-STEM Software Request - Guide Approval Form

User Details

- ✓ **Name of Researcher:** Prasad S M
- ✓ **User Type:** Ph.D. Scholar
- ✓ **Institution Name :** Manipal Institute of Technology, Manipal.
- ✓ **Institutional Contact No:** 0820 2571201 / Mob: 8123847327 (Dr. Arjun Sunil Rao) (Guide)
- ✓ **Research Topic:** Study of photonic bandgap-based structures for sensing applications.
- ✓ **Software Request Details**

- **Software Name:** COMSOL MULTIPHYSICS.

- **Justification for Software Request:** The proposed research focuses on the design, simulation, and analysis of photonic bandgap structures, particularly one-dimensional photonic crystals, for advanced sensing applications. COMSOL Multiphysics, with its dedicated Wave Optics Module, provides a powerful simulation environment to model electromagnetic wave propagation, resonance phenomena, and optical confinement within layered photonic structures. The software's capabilities, such as handling complex refractive index profiles, parametric sweeps (wavelength/angle), and high-precision meshing for nanoscale materials (e.g., monolayers), are essential for accurately predicting photonic bandgap behaviour and optimizing sensor sensitivity and figure of merit. Additionally, COMSOL supports multi-physics coupling, enabling future integration with thermal or mechanical effects if required. Access to COMSOL Multiphysics will directly facilitate achieving the research objectives by enabling precise, reproducible simulations aligned with international research standards.

- **Guide/Supervisor Approval**

I, Dr Arjun Sunil Rao

- 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: 05/05/25

Department of
Electronics & Communication Engg.
M.I.T., MANIPAL - 576 104

Official Stamp/Seal: