

I-STEM Software Request - Guide Approval Form

User Details

- **Name of Researcher:** Abhiram E R
- **User Type:** ☒ Ph.D. Scholar ☐ Postdoctoral Researcher ☐ Bachelor's ☐ Masters
- **Institution Name :** Indian Institute of Technology, Palakkad
- **Institutional Contact No:** 04923 226 501
- **Research Topic:**
Battery Thermal Management System (BTMS) of Prismatic Cells using Phase Change Materials (PCMs) with hybrid cooling techniques

Software Request Details

- **Software Name:** COMSOL (Basic + Advanced Modules)
- **Justification for Software Request:**

In line with the Nation's vision of green environment, developing affordable, high performance electric vehicles is significant. Researchers worldwide are making significant advancements in this field, resulting in the development and availability of high-quality electric vehicles for the public usage. Many recent studies have indicated that lot of research is being concentrated in this area and many simulation studies have been carried out across the globe leading to promising results, but these are to be tested vigorously before they can be mass manufactured.

A journal published by Applied Thermal Engineering in 2023, titled – 'Research on battery thermal management system based on liquid cooling plate with honeycomb-like flow channel', the author has used COMSOL Multiphysics software to do the simulation. In a recent paper, published by Energy in 2024, titled – 'Performance enhancement of a battery thermal management system using novel liquid cold plates with micro-channel featuring pin fins', the author has done CFD simulation using ANSYS.

This indicates that, there is a need for in depth analysis of the BTMS and analysis is done using simulation software as COMSOL and ANSYS are generally preferred. In my research, I would like to perform the simulations and to understand the physics and need to use COMSOL for my research. Since this involves PCMs and associated BTMS, I would request license for the Advanced Modules of COMSOL, specifically

1. CFD Module
2. Heat Transfer Module
3. Battery Design Module
4. Liquid & Gas Properties Module
5. Pipe Flow Module
6. Porous Media Flow Module

With reference to the above subject, I would like to request you for the license for the above-mentioned modules of the COMSOL.

Guide/Supervisor Approval

I, Dr. Samarjeet Chanda (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:

 (Samarjeet Chanda)

Date: 17/04/2025

Official Stamp/Seal:

डॉ. समरजीत चंदा / **Dr. Samarjeet Chanda**
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Important Notes

1. This form must be signed and scanned
2. The scanned copy must be uploaded with the software request
3. Electronic signatures are acceptable if from an official institutional email