

## I-STEM Software Request - Guide Approval Form

### User Details

- Name of Researcher: Kundlik Balasaheb Kshirsagar
- User Type: [ ] Ph.D. Scholar
- Institution Name : Dr. D.Y. Patil Institute of Technology, Pimpri, Pune
- Institutional Contact No: 020 2780 5299
- Research Topic: Battery Thermal Management system for Electrical vehicles

### Software Request Details

- Software Name: COMSOL Multiphysics
- Justification for Software Request:

COMSOL Multiphysics is highly effective for lithium-ion battery thermal management simulation because it allows coupled electrochemical, thermal, and fluid-flow analysis within a single platform. In battery thermal studies, COMSOL enables accurate modeling of heat generation due to internal resistance and electrochemical reactions, along with conduction, convection, and radiation heat transfer. Its multiphysics capability helps in analyzing temperature distribution, hot-spot formation, and the impact of different cooling strategies such as air, liquid, or phase change materials. This makes COMSOL a powerful tool for optimizing battery pack design, improving thermal safety, and enhancing battery performance and lifespan.

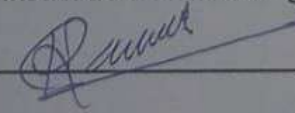
### Guide/Supervisor Approval

I, DR. Ramesh K. Kavade,

- 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: 22/1/2026

Official Stamp/Seal:

### 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

