Outreach & Dissemination Services Office

CSIR – Central Building Research Institute

Roorkee – 247667 (UK)

Training Program on

'COMSOL Multiphysics Software'

6th November, 2025

Organized under the aegis of CSIR Integrated Skill Initiative

The **CSIR-Central Building Research Institute (CBRI), Roorkee**, organized a **one-day skill development training program on COMSOL Multiphysics software** on **6th October 2025** under the **CSIR Integrated Skill Initiative Program**. The program aimed to build participants' competence in **multiphysics modeling and simulation**, and to promote the use of computational tools in engineering analysis, design, and research.

COMSOL Multiphysics is a powerful general-purpose simulation platform that integrates multiple physics phenomena—such as structural mechanics, fluid dynamics, heat transfer, and electromagnetics—into unified computational models. The training focused on helping participants gain conceptual and practical knowledge of using this software to solve real-world engineering and scientific problems. About **40 students from various universities** participated in the program, benefitting from both theoretical sessions and live demonstrations.

The **inaugural session** was attended by **Prof. R. Pradeep Kumar**, Director, CSIR-CBRI, and **Dr. Neeraj Jain**, Head, ODS, along with faculty members and scientists of the institute. In his address, Dr. Jain outlined the vision and objectives of the **CSIR Integrated Skill Initiative**, emphasizing the need to enhance computational proficiency among students and early-career researchers. Prof. Kumar encouraged participants to explore simulation tools like COMSOL to promote innovative thinking, efficient problem-solving, and sustainability in engineering design. The overall program was coordinated by **Dr. Tabish Alam**, Senior Scientist, CSIR-CBRI.

The **technical training sessions** were conducted by the **COMSOL Multiphysics India Pvt. Ltd.** team comprising **Ms. Kritika Raje (Applications Engineer)**, **Mr. Sharjed (Senior Applications Engineer)**, and **Mr. Himanshu Agrawal (Technical Sales Engineer)**. The experts introduced the participants to the COMSOL interface, explaining model-building workflows, physics selection, meshing, and post-processing techniques. Subsequent sessions covered advanced modeling domains including:

Mechanical and acoustic system modeling using Structural Mechanics, Acoustics, and Multibody Dynamics modules.

Fluid flow and heat transfer modeling employing CFD and Heat Transfer modules, demonstrating natural convection and radiation effects.

Corrosion and corrosion protection analysis highlighting galvanic corrosion and cathodic protection simulations.

Optimization and custom application development, showcasing the Application Builder and Java scripting for customized simulations.

Emerging applications such as Fluid–Structure Interaction (FSI), HVAC system simulation, semiconductor device modeling, and digital twin creation for real-time predictive design.

Through detailed demonstrations and guided exercises, participants gained a strong understanding of how multiphysics simulations can accelerate innovation and improve design efficiency in scientific and industrial settings.

The program concluded with an interactive discussion and positive feedback from the participants, who appreciated the clarity and practical approach of the sessions. The initiative successfully reinforced **CSIR-CBRI's commitment to promoting technical excellence, hands-on learning, and interdisciplinary skill development** under the **CSIR Integrated Skill Initiative Program**.

COMSOL Multiphysics team conducting technical sessions for the students.