



**CSIR – Central Building Research Institute  
Roorkee – 247667 (UK)**



**Skill Development Training Programme on  
Multi-Hazard Resistant Housing and Habitat  
for the Engineers of Uttarakhand State  
September 23-27, 2019 at CSIR-CBRI, Roorkee**

**About the Course**

Design professionals agree that the most successful way to mitigate losses of life and property is to design and construction of disaster resistant buildings. An integrated approach should be incorporated into the project planning, design, and development at the earliest possible stage. A variety of techniques are available to mitigate the effects of hazards on the built environment. Depending on the type of hazard, the location and type of construction of a structure can be designed to resist hazard induced loads. To reduce the risk from the hazards in existing building retrofitting and repairs of the structure can be undertaken. These demands proper planning, design, construction method use of innovative materials and trained manpower.

CSIR-CBRI is one of the leading institutions in the country which has developed innovative technologies for architectural and structural design of multi-hazard resistant construction for different houses and habitat. These technologies have been demonstrated in field, and hands-on training has been provided of grass root level functionaries in different parts of the country. It is essential to mass implement multi hazard resistant technologies developed by different institutions. This demands development of skills and capacity building among the administrative and technical functionaries at the state/district level for its systematic implementation. To achieve this, professionals needs to be trained in the application of innovative technologies for disaster risk mitigation.

Housing is one of the basic needs of any individual, and a mandatory requirement for the sustainable growth of any state. Uttarakhand being a hilly state has to face two challenges simultaneously; one is of addressing housing need whereas other is providing safety to houses from various natural calamities such as earthquake, landslides, heavy rainfall and flash floods. Most casualties in the event of disasters are caused by the collapse of buildings, both engineered and non-engineered, and structural mitigation measures are the key to make a significant impact towards earthquake safety in our country. Additionally, there are significant revisions in most of the Indian standards in the last decade due to enhancement in knowledge. This calls for update of relevant provisions and measures. For successful disaster mitigation, it must be ensured that all new constructions in the seismic zone are compliant

with the BIS Codes and for this purpose a techno-legal regime must be put in place. In-so-far as the existing stock of building is concerned; and retrofits the lifeline buildings in first instance. As a step towards disaster risk reduction, one of the initiatives taken-up by the government of Uttarakhand, for training of Administrators, engineers and Contractors is timely and a prominent step in the right direction.

## **Aim**

Recognizing the needs of Uttarakhand State, it is being proposed to develop a pool of trained professionals in the construction of multi hazard resistant buildings, CSIR-Central building research institute is conducting five days training course on “Multi-Hazard Resistant Housing and Habitat” during September 23-27, 2019 at its premises. This training course is particularly aimed at enhancing knowledge and skills of the implementing agencies to incorporate multi hazard resistant techniques for housing and habitat in different scenarios to mitigate the risk in existing buildings and upcoming constructions through lectures, demonstrations and hands-on exercises.

## **Objectives:**

The main objectives of the course are as follows:

- ✓ To learn from the building damage scenario created by past disasters.
- ✓ To appreciate the importance of multi hazard-resistant construction.
- ✓ To enable the participants to understand and apply basic concepts of multi hazard resistant designs and planning strategies in construction projects.
- ✓ To identify various foundation techniques, structural designs and building construction methods for different disasters.
- ✓ To identify the various structural and non-structural retrofitting and strengthening measures for existing buildings/houses.
- ✓ To understand the building byelaws.
- ✓ To improve the skills of participants in implementing multi hazard-resistant technologies in the construction of buildings/houses.

## **Expected Outcome**

- Participants would be able to use disaster resisting technologies for the construction.
- Apply tools for construction practices.
- Practice and rehearse the implementation of multi hazard resistant designs and construction methods.
- Understand the buildings byelaws and their implementation in different projects.

## **Target Group:**

The target participants consist of about 40 engineers covering various departments of Government of Uttarakhand.

**Evaluation**

The final session will be devoted to evaluation and validation. The participants will be supplied with an evaluation proforma, which they will complete and hand over to the course staff.

**Certificate**

A Certificate will be awarded to each participant on successful completion of the training course.