



9-11 OCTOBER, 2017 ADVANCED DESIGN COURSE ON SEISMIC SAFETY OF BUILDINGS

Venue: Bougainvilla, Tripureswor, Kathmandu, Nepal
(Non-Residential)

Target Group:
Design Professionals
Post Graduate Students of Structural/Earthquake Engineering



NORSAR



BCIT BRITISH COLUMBIA
INSTITUTE OF TECHNOLOGY



NSET
Earthquake Safe Communities in Nepal



ESS
EARTHQUAKE SAFETY SOLUTIONS

3 Days **SPECIALIZED**
COURSE
On

Engineering Seismology, Geotechnical and Structural Earthquake Engineering

Organizers

- Institute of Engineering, Nepal
- NORSAR, Norway
- British Columbia Institute of Technology, Canada
- Indian Institute of Technology Roorkee, India
- National Society for Earthquake Technology-Nepal
- Earthquake Safety Solutions, Nepal

WHY THIS COURSE IS NEEDED IN NEPAL ?

Kathmandu and other urban centers in Nepal have witnessed an unprecedented urbanization in recent years. Like in other sectors, this creates huge pressure on infrastructure development including the construction of multi-story buildings. The building construction industry is not limited to conventional owner-driven construction of 3-4 storey RC buildings as it has been in the past, and now deals with design and construction of mid-rise residential, commercial and office buildings, hotels, etc. At the same time, it was observed that the 2015 Gorkha Earthquake had not only caused damage to low-strength masonry houses, but exposed the flaws and deficiencies in professionally engineered structures by suffering significant damages. The engineering community realized the need of adopting state-of-the-art practices in seismic design of such buildings including lessons from recent earthquakes. The offered course is customized for professional structural engineers by extending their technical knowledge and by increasing their understanding on issues of seismic analysis, design and construction.

WHO SHOULD ATTEND?

This training course is targeting design professionals involved in the seismic analysis and design of buildings and structures. Municipal engineers who are involved in design checks and code compliance also will greatly benefit from the course. Post-graduate students of geotechnical/structural/earthquake engineering who have prior knowledge and experience in design practice will further consolidate their understanding of the field. Participants are recommended to bring their laptop computers with structural design software of their use.

WHAT ARE THE OBJECTIVES OF THE COURSE?

The purpose of this course is to enhance the national capacity on earthquake resistant design of structures. The specific objectives are:

1. To enhance the understanding on engineering seismology, geotechnical and structural earthquake engineering.
2. To impart knowledge on various seismic analysis methods in practice worldwide.
3. To apply the Capacity Based Design Approach and Performance Based Design Procedures in seismic design of buildings.

COURSE FEE

- For Design Professionals - NPR 10,000/person
- For Post Graduate Students - NPR 5,000/person

COURSE CONTENT

MODULE 1

Concepts on Engineering Seismology

- Seismological parameters, terminologies
- Seismic zonation
- Site classification and design response spectra
- DSHA and PSHA
- Local Site effects

Geotechnical Analysis

- Site Analysis
- Site Classification and Liquefaction Analysis
- Soil-Structure Interaction



MODULE 2

Principles of Earthquake Resistant Design

- Philosophy of earthquake resistant design
- Concept of strength and displacement
- Concept of over-strength, redundancy and ductility
- Consideration of configuration
- Inelastic energy dissipation and Response Reduction
- Effective stiffness and damping

Code Basis and Applications

- Seismic codes (NBC 105/ IS 1893:2002/ Eurocode 8/ IBC 2015)
- Standards and Material Codes

MODULE 3

Analysis Methods

- Structural system for lateral loads
- Linear equivalent method
- Response spectrum method
- Nonlinear Static Methods
- Nonlinear Dynamic Methods

MODULE 4

Design Approach and Procedures

- Capacity Design Approach
- Performance-based Design Approach
- Seismic Design of Masonry Buildings
- Seismic Design of RC Frame Buildings
- Effect of masonry infills on Seismic Performance and Design
- Seismic Design of Shear Walls



CERTIFICATION

Participants who attend all sessions will receive certificate of professional design hours (PDH).

INSTRUCTORS:

Ms. Hima Shrestha (NSET), Course Coordinator
Prof. Prem Nath Maskey (IOE, Nepal)
Dr. Dominik Lang (NORSAR, Norway)
Prof. Yogendra Singh (IITR)
Dr. Abdelghani Meslem (NORSAR, Norway)
Dr. Bishnu Hari Pandey (BCIT)
Mr. Surya Narayan Shrestha (NSET)
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Dr. Narayan Marasini (NSET)
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For Further Information

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ORGANISERS

IOE

Institute of Engineering (IOE) is the pioneer and prestigious engineering institute in Nepal and visioned to be instrumental to achieve this national goal of prosperity of the country and the people. This can be done by producing capable and competitive engineering graduates and research works.

NORSAR

NORSAR is an independent research foundation specialized in seismological research and engineering services relevant to the society. During the last decade NORSAR has become increasingly engaged in seismic risk and vulnerability research and development aimed at societal units like cities and municipalities. By combining civil engineering and earth scientist competence, NORSAR has developed a unique environment such earthquake hazard, vulnerability and risk evaluations. These efforts have over the past years included seismic hazard and risk projects in many earthquake exposed countries, including Guatemala, Nicaragua, El Salvador, Pakistan, India, or entire Central Asia. NORSAR has together with the University of Alicante developed the SELINA Open Risk software (www.norsar.no) that computes expected damage, economic losses and casualties from earthquakes, either as scenarios or in real-time mode.

IIT Roorkee

The Department of Earthquake Engineering at IIT Roorkee is one of its kinds in India and was established in 1960 as School of Research and Training in Earthquake Engineering. The Department has provided yeomen service in teaching, research, training and rendered advice in the field of Earthquake Engineering for last 50 years. The department has expertise in all the fields of Earthquake Engg. including Engineering Seismology and Hazard Assessment, Seismic Instrumentation, Geotechnical Earthquake Engineering, and Structural Earthquake Engineering, it offers post-graduate degrees in Soil Dynamics, Structural Dynamics and seismic Vulnerability and Risk Analysis. The department has played crucial role in development of seismic design codes in India, and has intensive interaction with the industry.

BCIT

With about 50,000 students enrolled annually, the British Columbia Institute of Technology (BCIT) is one of the largest post-secondary institutes in British Columbia, Canada. Founded in 1964, BCIT has established itself as one of the leading educational institutes in engineering; health sciences; business; trades, apprenticeship and technical; and natural and applied sciences.

Renowned for offering hands-on, practical learning, BCIT graduates are more than ready to succeed in their careers from day one. Its curriculum and applied research are industry connected, and help ensure, year-after-year, that BCIT is advancing the state of practice.

NSET

NSET is a not-for-profit professional technical organization working in earthquake risk reduction in Nepal and Asia region since its establishment in 1994. NSET's goal is to foster the advancement of science and practice of earthquake engineering and technology for mitigating earthquake risk and increasing seismic safety, to enhance professionalism, professional engineering and scientific ethics and to further the objectives of the International Association for Earthquake Engineering as applicable to Nepal. Through its programs, NSET regularly conducts training of engineers, professionals and others involved in construction industry to enhance their capacity in earthquake risk mitigations.

ESS

Earthquake Safety Solutions (ESS) is a social entrepreneurship registered with Government of Nepal in 2014 under Companies Act, 2063 (2006) as "company not distributing profit". The company is established to work in reducing earthquake risks of existing buildings and physical infrastructures, to promote safer building construction practices through research and development on approaches, methodologies and appropriate technologies; and also to help communities build earthquake resilient through awareness raising, capacity building and actions on risk reduction and preparedness.