

Geotechnical Engineering for Disaster Mitigation

Overview

The sufferings during natural disasters such as earthquake, Tsunami, flood etc. are increasing and more loss of life is reported in recent times. Study also reveals that countries like India which are less developed in terms of disaster management suffer more during natural disasters. India has experienced many such disasters in recent times. Jabalpur earthquake of 1987, Latur earthquake of 1993, Bhuj earthquake of 2001, Sumatra earthquake of 2004 that caused Tsunami affecting many coastal regions of India, recent Nepal earthquake of 2015, Flood in Uttakhand in 2013, Rain and flood in Chennai in 2015 and the recent floods and landslide in Kerala and Kodagu have all shown the under-preparedness of India in facing the disaster. Rapid growth in population, urbanization since 1970s, migration of people to urban centers, growth of slums in cities where poorer segment of society live without adequate sanitation and safety measures have caused serious problems to quality of life in urban areas. All these have resulted in the development of un-engineered structures that do not follow the bylaws of the region. Major casualties during disaster are due to improper construction to face horizontal dynamic force.

More emphasis is given to superstructure that is made earthquake, flood or wind resistant. Codal provisions exist for guidelines to structures subjected to such extraordinary forces. But it should be noted that all structures are built on ground and most structures such as earth dams, rock fill dams, embankments etc. are built with soil as the construction material. It is well known that the behavior of soil is in general complex and is even more difficult to understand during dynamic loading. There is less emphasis on knowledge about ground behavior under dynamic loading.

Hence, the focus of the proposed course is on understanding the behavior of ground subjected to horizontal dynamic force such as earthquake, flood and Tsunami. Earthquake Geotechnical Engineering is an emerging field in Civil Engineering globally and many topics such as Liquefaction and Site effect are being understood much better in recent times with the available experimental studies, model testing and computer simulations. Japan has always been in the fore front in such studies and has well equipped expertise. Codal provisions in India are still in infant stage and the developments in Japan are no way comparable. This course is proposed considering the experience and expertise of the international professor, need for such study on geotechnical disaster mitigation in India and available reasonable resources at Sri Jayachamarajendra College of Engineering, Mysuru.

Objectives

The primary objectives of the course are:

- To introduce Geotechnical engineering from disaster mitigation perspective.
- To impart knowledge on the relevance of liquefaction, site effect, dynamic earth pressure etc. for mitigating against earthquake effects.
- To guide on the performance of geotechnical structures such as foundations, retaining walls, embankments, earth and rockfill dams, and slopes against earthquake, flood or Tsunami effects
- To demonstrate the problems associated with landslides and possible mitigation against slope instability.
- To train the methodologies for the design of geotechnical structures subjected to unexpected forces.
- To introduce Japanese design techniques for the analysis and design of geotechnical structures subjected to unexpected forces.

Date	21st to 31st December, 2018
Who can attend?	<ul style="list-style-type: none"> ➤ Students at all levels (B.Tech./M.Sc./M.Tech./Ph.D.) or Faculty from academic and technical institutions ➤ Executives, engineers and researchers from service and government organizations including R&D laboratories
Registration Fees	<p>The participation fees for taking the course is:</p> <ul style="list-style-type: none"> • Students/Industry/Academic Institution/ Research Organization : Rs. 2,000.00 + 18% GST • Participants from abroad : US \$ 200.00 + 18% GST • Faculty from host institution : Rs. 1,000.00 + 18% GST • Students from host institution : Rs. 1,000.00 <p>The above fee includes all instructional materials and laboratory usage charges.</p>
General Information	<ul style="list-style-type: none"> ➤ Number of participants for the course will be limited to fifty. ➤ Selected candidates will be intimated through e-mail. ➤ Participants are encouraged to bring their own laptop. ➤ Participants are expected to make their own arrangements for accommodation. ➤ In case of any query, please feel free to contact the Course coordinator.

The Faculty



Ikuo Towhata (東畑 郁生) is Professor Emeritus at University of Tokyo, Visiting professor at Kanto Gakuin University, Yokohama and Formerly President of the Japanese Geotechnical Society in Japan. He is the Vice President for Asia of ISSMGE (International Society for Soil Mechanics and Geotechnical Engineering) and

Director at Tohata Architects & Engineers in Japan. He obtained his doctorate in Civil Engineering from the University of Tokyo, Japan. His fields of interest include deformation characteristics of cohesionless soils, Dynamic analysis of earth structures during earthquakes, Permanent displacement of ground caused by seismic liquefaction, Microscopic Observation of Granular Behavior of Sand Subjected to Shear, Dynamics of landslide and debris flow, Mechanical Properties of Municipal Waste Ground, Seismic performance-based design of geotechnical structures, Mitigation of rainfall-induced slope instability. He has published over 500 research articles, guided more than 24 doctoral students, published a best seller book on Earthquake Geotechnical Engineering from Springer in 2008 and secured many awards and honours. He has delivered many prestigious lectures and is on many important committees of geotechnical engineering world over.



S.K.PRASAD is Professor of Civil Engineering at Sri Jayachamarajendra College of Engineering, Mysore with over 33 years of teaching and research experience. He obtained his Bachelor degree in Civil Engineering from the University of Mysore securing First Rank in 1982, Master degree in Geotechnical

Engineering from Indian Institute of Technology, Kanpur in 1985 and doctoral degree from University of Tokyo in Japan. He has published over 130 technical papers in National and International Journals and conferences, guided over 70 Masters dissertations and guided three doctoral students. He has completed several sponsored Research projects from AICTE and DST. He was a visiting Assistant Professor at Asian Institute of Technology, Thailand for January 2006 term. He has developed Earthquake Engineering Laboratory at his college. He successfully organized Indo-Japan Workshop in Earthquake Geotechnical Engineering in Kochi during December 2011 and many national and international level workshops at his institution. He was the guest editor for special issue on Earthquake Geotechnical Engineering of June 2013 issue of Indian Geotechnical Journal. He has delivered lectures in four VTU-EDUSAT programs and coordinated three of them.

Course Coordinator

Dr. S. K. Prasad

Department of Civil Engineering
Sri Jayachamarajendra College of
Engineering, Mysuru - 570 006
Karnataka, India

Phone: +91 821 2548285 (o)
+91 94496 21994 (m)

E-mail: skprasad@sjce.ac.in
prasad_s_k@hotmail.com

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<http://www.gian.iitkgp.ac.in/GREGN>