

TEQIP Sponsored Winter School
on
Recent Advances in Structural Engineering
and Materials

January 14 & 15, IIT Hyderabad

Sponsored By



TEQIP - II



Department of Civil Engineering
Indian Institute of Technology Hyderabad
Ordnance Factory Estate, Yeddumailaram, Telangana - 502 205, India.

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**TEQIP Sponsored Winter-School
on
Recent Advances in Structural Engineering and Materials
January 14 & 15, IIT Hyderabad**

Wednesday, January 14, 2015

VENUE: Lecture Hall 3, Main Building, IIT Hyderabad

Opening	
8:00-8:30	Registration

Advances in Sustainable Infrastructure Materials (Materials with Low Carbon Footprint, high performance materials with low quantum consumption, and recycled materials)	
9:00-11:15	Advances in developing Consistent Fly Ash based binders Dr. K.V.L. Subramaniam, Professor, Department of Civil Engineering, IIT Hyderabad
	Innovative Concrete Materials with Low Carbon Footprint Dr. Rishi Gupta, University of Victoria, Canada
	Alternate Binders using Calcined Clay Dr. Shashank Bishnoi, IIT Delhi
	Question and Answer

Tea-break	
11:15-11:30	Tea-Break

Advances in Performance Monitoring and Prediction (Structural Health Monitoring of civil infrastructure, Performance Prediction)	
11:30-1:15	Advances in Structural health Monitoring for Ageing Infrastructure Dr. C.S. Manohar, Professor, Department of Civil Engineering, Indian Institute of Science, Bengaluru
	Advances in Seismic Structural Monitoring and Earthquake Warning Systems Dr. Carlos Ventura, Professor of Civil Engineering and Director of Earthquake Engineering Research Center, University of British Columbia

Lunch	
1:15-2:00	Lunch

Advances in Strengthening Technologies (performance enhancement through innovative materials and strengthening techniques)	
2:00-3:30	Advances in Strengthening of non-Engineered Construction Dr. Ananth Ramaswamy, Professor, Department of Civil Engineering, Indian Institute of Science, Bengaluru
	Rehabilitation of Deteriorated Structures using High Performance Fiber Reinforced Shotcrete Dr. Nemy Banthia, Professor, Distinguished University Scholar and Senior Canada Research Chair, Department of Civil Engineering, University of British Columbia
	Question and Answer

Tea-break	
3:30-3:45	Tea-Break

Technology Implementation (Strengthening, health monitoring and smart sensing)	
3:45-5:30	Application of Fibre Reinforced Polymer (FRP) in Infrastructure Repair and Strengthening Dr. Ashutosh Bagchi, Concordia University
	Implementation of Structural Health Monitoring Dr. Abdussamad Siddiqui, Starmass Environmental Technologies;
	Field Applications of FRP Strengthening- Case Studies in India Dr. Gopal Rai, R&M International
	Question and Answer

Thursday, January 15, 2015

VENUE: Lecture Hall 3, Main Building, IIT Hyderabad

Advances in Condition Assessment (Damage Assessment and Fire Performance)	
9:30-11:30	Damage Assessment in Concrete Structures including Fire Effects Dr. K.V.L. Subramaniam, Professor, Department of Civil Engineering, IIT Hyderabad
	Fire Performance Modeling of Structures and Enhancement in Indian Context Dr. Anil Agarwal, Assistant Professor, Department of Civil Engineering, IIT Hyderabad

Tea-break	
11:30-11:45	Tea-Break

Advances in Strengthening Technologies (performance enhancement through innovative materials and strengthening techniques)	
11:45-12:30	Strengthening of Concrete Structures using External Post-Tensioning- An Overview Dr. S. Suriya Prakash, Assistant Professor, Department of Civil Engineering, IIT Hyderabad
	Question and Answer
Lunch	
12:30-1:30	Lunch

Field Visit- STARMASS Facility/ Visit to Laboratories	
1:30-5:00	Dr. Abdussamad Siddiqui, Starmass Environmental Technologies;

List of Speakers:

Dr. Ananth Ramaswamy, Professor, Department of Civil Engineering, IISc, Bengaluru

Dr. C.S. Manohar, Professor, Department of Civil Engineering, IISc, Bengaluru

Dr. Carlos Ventura, Professor of Civil Engineering and Director of Earthquake Engineering Research Center, University of British Columbia

Dr. K.V.L. Subramaniam, Professor and Head, Department of Civil Engineering, IIT Hyderabad

Dr. Nemy Banthia, Professor, Distinguished University Scholar and Senior Canada Research Chair, Department of Civil Engineering, University of British Columbia

Dr. Ashutosh Bagchi, Associate Professor, Concordia University

Dr. Gopal Rai, CEO, R&M International

Dr. Abdussamad Siddiqui, Starmass Environmental Technologies, Canada

Dr. Anil Agarwal, Assistant Professor, Department of Civil Engineering, IIT Hyderabad

Dr. Shashank Bishnoi, Assistant Professor, IIT Delhi

Dr. Rishi Gupta, Assistant Professor, University of Victoria, Canada

Dr. S. Suriya Prakash, Assistant Professor, Department of Civil Engineering, IIT Hyderabad

SPEAKER BIOGRAPHIES

Dr. Ananth Ramaswamy, Professor, Department of Civil Engineering, IISc, Bengaluru



Dr. AnanthRamaswamy is a Professor in the Department of Civil Engineering, Indian Institute of Science, Bangalore, India. He has done his B. Tech from Indian Institute of Technology, Madras (IITM) in the Department of Civil Engineering in 1985. He has completed his MS from University of California at Davis in 1986 and obtained his doctorate from Louisiana State University in 1992. Prior to joining as an Assistant Professor in the Department of Civil Engineering, IISc, he served as a lecturer in the Department of Civil Engineering, Indian Institute of Technology, Kharagpur. Research interest of Prof. AnanthRamaswamy involves various interdisciplinary subjects and broadly encircles, 'Analysis and design of reinforced concrete structures', 'pre-stressed and fiber reinforced concrete'; 'Bridge Engineering'; 'Structural and Shape Optimization'; 'FRP Composites'; 'Smart Materials and Vibration Control'. Further details of his research interests are highlighted in research page. He has published more than 30 research papers in various international journals, 2 book chapters and more than 45 national and international conference papers. He has served as a reviewer for various prestigious national and international journals.

Dr. CS Manohar, Professor, Department of Civil Engineering, IISc, Bengaluru



Prof Manohar's research interest include (i) Bayesian methods for system identification and model selection (ii) Global sensitivity analysis for dependent random and hybrid uncertainty models (iii) Random vibration testing with controlled samples (iv) Performance based structural engineering for multiple hazards. He has published more than 70 research papers in various international journals, 2 book chapters and more than 100 national and international conference papers. He has served as a reviewer for various prestigious national and international journals.

Dr. Carlos Ventura, Director Earthquake Engineering Research Facility, Professor of Civil Engineering, , University of British Columbia, Vancouver, Canada



Dr. Carlos Ventura is currently the Director of the Earthquake Engineering Research Facility (EERF) at UBC and has more than 30 years of experience as a structural engineer. Dr. Ventura's areas of research are in Structural Dynamics and Earthquake Engineering. He has been conducting research on the dynamic behavior and analysis of structural systems subjected to extreme dynamic loads, including severe ground shaking for more than twenty years. His research work includes experimental studies in the field and in the laboratory of structural systems and components. Research developments have included development and implementation of performance-based design methods for seismic retrofit of low rise school buildings, novel techniques for regional estimation of damage to structures during earthquakes, detailed studies on nonlinear dynamic analysis of structures and methods to evaluate the dynamic characteristics of large Civil Engineering structures. His current research is focused on the development of performance-based guidelines for seismic retrofit of schools, on methods to evaluate the interaction between critical infrastructure vulnerable to natural and man-made hazards, and on structural health monitoring of building, bridges and dams. Dr. Ventura has written over 400 technical papers and reports related to the seismic behaviour of structures, and has received numerous awards for his research accomplishments, including the Lieutenant Governor's Award of Excellence (2013), the Innovation Award of the Canadian Society of Civil Engineering (2010) and the APEGBC Meritorious Achievement Award (2006). He is a member of several national and international professional societies and advisory committees. He is a member of the Canadian Academy of Engineering and Fellow of Engineers Canada. He is also a member of several building and bridge code committees. In addition to his academic activities, Dr. Ventura is a recognized international consultant on structural vibrations and safety of large Civil Engineering structures.

Dr. K.V.L. Subramaniam, Professor and Head, Department of Civil Engineering, IIT Hyderabad



Dr. Subramaniam's research expertise is in the areas of material characterization using destructive and non-destructive methods , health monitoring and strengthening of structures. He has published several papers on condition assessment and repair of concrete structures. He has also served as a consultant on various projects related to condition assessment and strengthening. He is a fellow of ASCE and ACI, USA and serves on several international committees on concrete structures

Dr. Nemy Banthia, CEO & Scientific Director, IC-IMPACTS; Professor of Civil Engineering, Distinguished University Scholar and Senior Canada Research Chair in Structural Rehabilitation, University of British Columbia, Vancouver, Canada



Dr. Banthia's research interests are in low carbon footprint construction materials, crack resistant concrete, repair and strengthening and structural health monitoring using advanced sensors. A professional engineer in the province of BC, he continues to serve on the technical committees of various professional societies including the American Concrete Institute where he chaired the committee on fiber reinforced concrete for six years, RILEM where he chaired the Technical Committee on FRP-Concrete Bond, and the Canadian Standards Association where he chairs the Durability Committee of the Highway Bridge Design Code. Dr. Banthia has edited/co-edited eighteen volumes, published over 350 technical papers, and holds five international patents in the field of the present research proposal. Dr. Banthia serves on the editorial boards of eight international journals and is the Editor-In-Chief of Journal of Cement and Concrete Composites—a journal with the highest impact factor in the areas covered here. His awards include: WG Hislop Award of the American Concrete Institute (ACI) BC Chapter, four Best Paper Awards, the Wason Medal of the ACI International, Solutions Through Research Award of the British Columbia Innovation Council, Wolfson Merit Award of the Royal Society of the United Kingdom, Distinguished Researcher Award of the Korea Concrete Institute, Killam Research Prize from the Killam Foundation, Horst Leipholtz Medal of the Canadian Society of Civil Engineering and the Mufti Medal of the Int. Society for Health Monitoring of Infrastructure (ISHMII). He is a fellow of the ACI International, Canadian Society for Civil Engineering, Indian Concrete Institute, Canadian Academy of Engineering and the Royal Society of Canada.

Dr. Abdussamad Siddiqui, Director, Starmass Environment Technologies, Canada



Mohammed Abdussamad is a Director with Starmass Environment Technologies, Canada. He is responsible for Starmass activities both in the middle-east and India. He leads a highly specialized team of 150 - in areas of Infrastructure health monitoring. This includes, structural health monitoring, environmental monitoring, sub-surface water flow and distribution networks. His focus is Structural Health Monitoring. He has 35 years of experience behind him, with a large part in SHM. He is at present executing SHM for mega projects as large as 10,000 SHM sensing points networked to a single control station. Also, he has the honor of leading a mega corrosion prevention project for a large piled raft spread over an area of 4.4 square kilometers. He holds keen interest in academic research as well, and is associated with Universities in Canada, Middle-East and India. He is a visiting faculty in area of SHM. He enjoys being a guest lecturer. He has also mentored some of the graduate students in sensory networks in India.

Dr. Ashutosh Bagchi, Associate Professor and Associate Chair, Civil and Environmental Engineering, Concordia University, Montreal, Canada



Dr. Bagchi, currently an Associate Professor at Concordia University, Canada, received Ph.D. degree from Carleton University, Canada in 2001, M.S. from IIT-Madras in 1993, and B.E. from Jadapur University, Kolkata in 1989. His research interests include Structural Health Monitoring, Structural Dynamics and Earthquake engineering, Infrastructure Rehabilitation and Management. Dr. Bagchi is a licensed Professional Engineer in Ontario and member of many professional societies like CSCE, ASCE, CAEE (Can. Assoc. of Earthquake Engineering) and ISHMII (Int. Soc. for SHM of Intelligent Infrastructure). He has authored/coauthored more than one hundred articles in technical journals and conferences, two patent applications, and a number of technical reports for academia and industry

Dr. Gopal Rai, Founder, R&M International Inc.



Dr. Gopal Rai now has around a decade experience in the structural strengthening and retrofitting. He was involved in execution of various projects like Apsara reactor BARC, Mumbai Airport mithi river bridge strengthening, ESIC Hospitals, and JNPT ROB Bridge. He is also associated with structural engineering association like ASTR (Association of Structural Rehabilitation) as a General Secretary. Member in program committee of IEI, Mumbai. He has coordinated several conferences and technical seminars actively like WSRR. He is also associated with various research projects in IIT Bombay, SPCE Mumbai, DST and BARC

Dr. Shashank Bishnoi, Assistant Professor, IIT Delhi



Dr. Bishnoi's research expertise is on experimental and numerical studies into hydration of cement and supplementary cementitious materials, sustainability, resource utilisation, durability, repair and life-cycle costs of concrete structures. Before joining IIT-Delhi, he worked as a Post-doctoral fellow in Laval University, Quebec City, Canada (2009-2010). He was also a post-doctoral fellow at Ecole polytechnique Fédérale de Lausanne, Lausanne, Switzerland (2008-2009). He completed his Ph.D. from Institute of Materials, Ecole polytechnique Fédérale de Lausanne in 2008. He received his Master of Engineering from University of Tokyo in 2004 and Bachelor of Technology in Civil Engineering from Indian Institute of Technology, Kanpur in 2002. He has published several research papers in various international journals, national and international conference papers. He is also a reviewer for various prestigious national and international journals.

Dr .Anil Agarwal, Assistant Professor, IIT Hyderabad



Dr. Anil Agarwal's research expertise is Fire and its effects on structural systems; Design of fire resistant structures; Design and behavior of steel structures; Structural stability; Steel-concrete composite structures; Collapse analysis; Earthquake Engineering, Soil-structure interaction, Finite element method of analysis. He did his PhD from Purdue University, USA, 2011. He received his both M-Tech and B-Tech from IIT Kanpur. Before joining IIT H, he worked Research and Development Engineer, with Bentley Systems, Inc., USA from July 2011 to July 2014.

Dr .S. Suriya Prakash, Assistant Professor, IIT Hyderabad



Dr. Suriya Prakash's research expertise is on structural behaviour and design of reinforced concrete and prestressed concrete systems. He worked with Structural Group Inc, USA a renowned firm in strengthening design and construction using advanced construction materials. He has designed strengthening solutions for several buildings in the US and middle east. He has authored several papers on behaviour of reinforced concrete columns and strengthening with FRP composites. He is a member of ASCE and ACI, USA. He is also a reviewer for various prestigious national and international journals.

Dr. Rishi Gupta, Assistant Professor, Department of Mechanical Engineering, University of Victoria, Victoria, Canada



Dr. Gupta's research is in the area of: (i) Advanced materials for structures- Hybrid Fiber Reinforced Concrete, use of supplementing cementing materials in concrete, cement-based mortars for masonry with improved bond properties, cellular light weight concrete, and Fiber Reinforced Polymers; (ii) Structural health monitoring of reinforced concrete structures and NDTs; (iii) Plastic shrinkage of concrete and development of 'crack-free' cement composites; (iv) Durability and corrosion studies of reinforced concrete; and (v) Innovative construction technologies: insulated wall systems, rammed earth, Light Gauge Steel system for modular construction. He is has served as the Chair and Vice Chair of the Association of Professional Engineers of British Columbia and serves as a member of the American Concrete Institute, and held various roles including Deputy Chair, International Affairs Committee of the CSCE.

CONTACT DETAILS

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Email : suriyap@iith.ac.in
Phone : +91-40-2301 7077
Fax : +91-40-2301 6302

DATE AND VENUE

The short course is proposed to be held at IIT Hyderabad, Yeddumailaram, Andhra Pradesh during January 14-15, 2015. IIT-Hyderabad is located in its temporary premises in the quiet residential campus of Ordnance Factory Medak (OFMK) at Yeddumailaram, about 45 km from the heart of Hyderabad city. The requisite infrastructure, namely hostels, classrooms, offices, recreation, sports and medical facilities, are all located within the OFMK Estate. The permanent campus is being constructed and is located on the National Highway 9 at Kandi village (near Sangareddy town,, Andhra Pradesh).

ABOUT IIT HYDERABAD

Inventions and innovations are key words on which the foundation of IITH is based. One of India's eight new IITs – IITH started functioning in August 2008. With a current strength of 100 faculty and 1200 students, IITH offers B.Tech program in seven disciplines, M.Tech in six disciplines, M.Sc seven disciplines, M.Tech in six disciplines, M.Sc in two disciplines and Ph.D in 11 disciplines. IITH develops state - of the - art infrastructure for advanced research and has produced over 100 publications in internationally reputed journals.

Research is a culture among the faculty and students of IITH. This is evident from the 25 research projects ranging from Rs 18 lakhs to Rs 18 crores that are ongoing at IITH. On top of the



gamut of sponsored projects from various funding agencies, IITH has active collaboration with industry as well. IITH also has an innovative academic program where the students are offered fractional credits and the first semester undergraduates are allowed to do a project of their choice. Many more innovations in the academic front are in the offing. IITH always strives to offer an innovative environment where one is not afraid to experiment with high-risk ideas.

COURSE MATERIAL

A copy of selected presentation material of the course will be provided along with other useful references and case studies.

REGISTRATION FEES

Application for participation in the short course may be sent in the attached proforma along with the registration fee to Dr. Suriya Prakash, so as to reach him before 10th of



January, 2015. The fee should be remitted by a crossed demand draft in favor of "IIT Hyderabad" payable at state bank of India. Rs. 7,000 / - per participant from

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REGISTRATION FORM

Personal Information :

Name :

Designation :

Organization :

Mailing Address :

Phone :

Email :

Registration Fee:

Enclosed is a crossed draft no.....

..... Dated

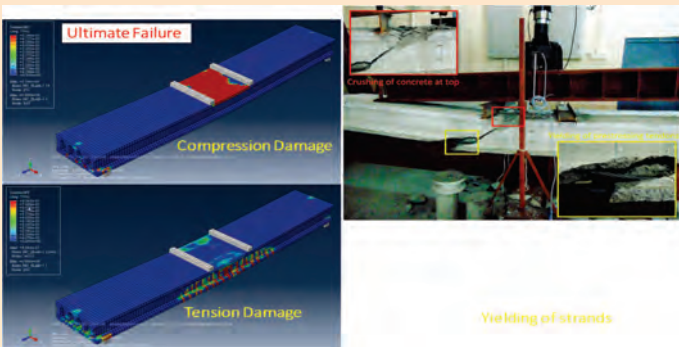
For Rs..... In favor of "IIT-Hyderabad", payable at State Bank of India, Hyderabad. Also, payment may be made directly to IIT-Hyderabad using Electronic Bank Transfer

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Industry and academic institutions. A limited seats are available for students whom the fee is Rs. 4,000/-.

Please indicate RAISE 2015 in the remarks section while attaching DD/in electronic funds transfer.

A scanned copy of registration from shall be sent through email (raise@iith.ac.in). Please see

www.iith.ac.in/~raise for any further details.

Travel, boarding and lodging expenses of the participants will have to be borne by the participants or their sponsoring organizations. A limited accommodation is available at the IIT-H guest house. Therefore, participants, who wish to avail this facility, are advised to write to Dr. Suriya Prakash well in advance, and in any case, not later than 10th of January 2015. The registration fees include lunch, dinner and refreshments.

