

Forensic Engineering and Failure Analysis

Overview

Research to address the aging infrastructure is increasing in India and worldwide at an exponential rate and is becoming the most critical issue upon facing increases in natural disasters and the demand for sustainable infrastructure that can accommodate the rapid growths in technological development and globalization. Hitherto, there is an urgent need to address approaches to prevent potential system-level failures, so that the costs of failures can be minimized and the burden to the existing stressed economy can be reduced.

The course will focus on the forensic aspects of structural engineering practice and it will provide the participants with the basics for the investigation of failures and understanding some of the pertinent legal aspects, and to prepare them for the eventual practice of forensic structural engineering.

Recent natural disasters including the Asian Tsunami and the Japanese earthquake, Vizag, Gaja cyclone have resulted in trillions of dollars in losses. Some of the natural disaster losses can be the breaking point to a fragile and intricate economy. The heavy price the society paying shows the necessity to understand and to develop methods to avoid such system-level failures. One of the benefits of forensic investigations is the lessons learned from failures and the use of those lessons to improve codes, standards and practices to avoid similar failures in the future. Therefore, the purpose of the course is not only to teach forensic investigation of failures and providing technical support in the consequent dispute resolution process, but also to show how to avoid failures and what the consequences of failures may be.

Course participants will learn these topics through lectures and tutorial sessions that reinforce their understanding, while also getting exposure to the avenue for further research.

Dates for the course	10th to 21st June 2019
Course content	<ul style="list-style-type: none"> ✚ Basics on forensic aspects of structural engineering, ✚ Understanding on legal aspects of forensic engineering; various problems in tools and techniques used in investigation. ✚ Case studies on structural, geotechnical and environmental forensics ✚ Forensic and Insurance practices for disaster investigation ✚ Rehabilitation Technique for Reinforced Concrete Structures after an Earthquake
You should attend if...	<ul style="list-style-type: none"> • You are an Executive/Engineer/Researcher from industry /service/ government organisation including R&D laboratories. • You are a faculty from reputed academic institution/ technical institution. • You are a student at any level (B.Tech./M.Tech./M.S/Ph.D.) <p>Number of participants for the course will be limited to sixty (60).</p>
Course fee	<p>The participation fee for taking the course is as follows: Participants from abroad: US\$500, Industry/Research participants: Rs. 20,000/- Academic Institutions: Rs. 10,000 (for faculty), Rs. 2000 (for full time PhD Students) and Rs. 1000 (for B.Tech/M.Tech/M.S students)</p> <p>The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges. Mode of payment: Demand Draft in favour of "The Director, NIT-Trichy" payable at Trichy. The demand draft is to be sent to the course coordinator at the address given in the following. The participants may be provided hostel accommodation, depending on the availability, on additional payment basis. Request for hostel accommodation may be submitted to : cnatarajan542@gmail.com</p>

The Faculty



Dr. Shen-En Chen, did his Ph.D in west Virginia University in the year 1996 and presently he is a Professor in the Department of Civil and Environmental Engineering at the University of North Carolina at Charlotte, United State of America with 20 years of professional experience. He is member of professional bodies such as American Society of Civil Engineers, Society of Experiment Mechanics, and ASCE-Technical Council for Forensic Engineering, International Society of Optical Engineering, American society of Non-destructive Testing and national Earthquake Engineering Society. Dr. Shen carried out more than 40 funded projects; he was an investigator and principle research scientist in the project “Bridge Vibration Sensing System” for U.S. Army in the year 1995-1999 with project cost of \$600,000. And he was Co-PI, “Carbon-Dioxide-Enhanced Oil Production from the Citronelle Oil Field in the Rodessa Formation, Southern Alabama.” US Department of Energy, totals \$6,000,000 (2007-2011). This is a multi-campus research including UAB, Alabama A&T U and UA. Dr. Chen received: \$380,816. He has published more than 200 research papers in National and International journals and conference; he is author of 11 books and has 2 patents.



Dr.C.Natarajan did Ph.D. degree from IIT Madras in 1984 and he is currently the Dean (Planning and Development) and Professor in Department of Civil Engineering at National Institute of Technology, Tiruchirappalli. He served as the member of the board of studies for various institutions. He has experience in structural design, forensic investigation, and construction of buildings, bridges and special structures. He has made numerous structural investigations, including the accident due to the boiler during erection, roof collapse due to corrosion, the collapse of Highway Bridge. With three decades of teaching, research and consultancy experience, he has published /presented several research papers in peer reviewed national and International journals/ conferences proceedings. He has conducted an international workshop on Indo US Forensic practices sponsored by the National Science Foundation USA, American Society of Civil Engineers, USA. He is very active in professional societies and chartered Chairman of the Indian Concrete Institute, Tiruchy centre and the Treasure of the Indian Society of Public Administration. He is the editorial member of the various International Journals. He has authored a book on “Matrix Methods of structural Analysis- theory and problems”. His research interest includes the Forensic Engineering, health monitoring of structures, condition assessment and rehabilitation of structures, recycling of construction and demolition waste.



Dr. J. Karthikeyan is an Associate Professor in Department of Civil Engineering, National Institute of Technology – Tiruchirappalli. His area of interest includes Concrete Structures, Structural Analysis and Design, High Performance Concrete and Materials, High Performance Pre-stressed Concrete Bridges. He is an active member of varios professional bodies related to materials. He has published in international journals / conferences. Recently he has granted a Patent.

Course Coordinators

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