

HIGH-END WORKSHOP on Advanced Techniques for Uncertainty Modelling and Quantification in Civil Engineering

18th July 2022 – 23rd July 2022



Organized by
Department of Civil Engineering,
National Institute of Technology, Tiruchirappalli
Tamil Nadu, 620015

Funded by:
Science & Engineering Research Board (SERB) under
'KARYASHALA' ABHYAAS Program
Accelerate Vigyan Scheme

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About the Institute

National Institute of Technology (formerly known as Regional Engineering College), Tiruchirappalli (NITT) has been declared as an Institute of National Importance by the GoI under the NIT Act. According to the NIRF ranking of the Indian Universities 2021 by the Ministry of Education, GoI, NIT Trichy has been ranked first among the NITs and as the 9th best Institute in Engineering category. With the cream of engineering and management talent encompassing exuberant students and inspiring faculty, integrated with state-of-the-art infrastructure facilities, NITT today has emerged as one of the premier institutions in the country.



About the Department

The Department of Civil Engineering, is one of the oldest departments at NITT. The department offers one UG course in Civil Engineering and five PG courses - Transportation Engineering and Management, Structural Engineering, Environmental Engineering, Structural Engineering, and Construction Technology and Management. The vision of the department is to shape infrastructure development with a societal focus.

Overview of the Workshop

The numerical simulations of engineering systems by employing various computational resources have helped in tackling challenging real-world problems. For many complex problems of physical and engineering interests, the dynamics of interest have uncertainties associated with them. The analysis and design of Civil Engineering systems involve decision making in the face of such uncertainties. Hence, the propagation and quantification of uncertainties play a significant role in the modelling of physical systems.

The sessions of the workshop will be curated to provide the students with an introduction to uncertainty modelling and train them in the application of uncertainty modelling in their scientific research. The sessions will cover the treatment of uncertainties in various domains of Civil Engineering such as structural engineering, water resources engineering, geotechnical and foundation engineering, and atmospheric and climate modelling. A software demonstration is also scheduled to illustrate the implementation of various techniques discussed in the workshop.

Objectives of the Workshop

- To sensitize and familiarize PG and PhD students with the consideration of uncertainties in analysis and design of Civil Engineering systems.
- To provide hands-on training for implementing the same in engineering decision making.

Programme Schedule

Topics	Speakers	Topics	Speakers
Probability theory, random variables, random processes	Dr. C. S. Manohar Professor, Dept. of Civil Engineering, IISc Bangalore	Statistical techniques for model selection, reliability analysis - FORM, SORM	Dr. K. Balaji Rao Emeritus Scientist, CSIR-SERC
Fuzzy logic and fuzzy linear optimization for water resources management	Dr. D. Nagesh Kumar, FASc Professor, Dept. of Civil Engineering, IISc Bangalore	Model order reduction in uncertainty quantification	Dr. Debraj Ghosh Professor, Dept. of Civil Engineering, IISc Bangalore
Risk and reliability analysis of geotechnical systems	Dr. G. L. Sivakumar Babu Professor, Dept. of Civil Engineering, IISc Bangalore	Handling uncertainties using fuzzy set theory	Dr. Anoop M. B. Senior Principal Scientist & Head, CSIR-SERC
Machine learning for uncertainty quantification in climate modelling	Dr. Deepak Subramani Assistant Professor, Dept. of Computational and Data Sciences, IISc Bangalore	Structural reliability estimation using shake table tests	Dr. Sonal Dhanvijay Assistant Professor, Dept. of Applied Mechanics, VNIT Nagpur
Uncertainty quantification in structural mechanics - Theory, simulations and applications	Dr. B. Radhika DST-INSPIRE Faculty, Dept. of Civil Engineering, IIT Tirupati	Global response sensitivity analysis, Polymorphic uncertainty modelling	Dr. Greegar George Assistant Professor, Dept. of Civil Engineering, NIT Tiruchirappalli

Target Participants:

Motivated Doctoral & Master's students (full time / part-time) in Civil Engineering or allied disciplines from Tier-I, Tier-II & Tier-III level institutes as defined under the 'Accelerate Vigyan' scheme by DST-SERB.

Course Assessment & Feedback

Active participation in lectures & discussion/interaction sessions along with a basic level evaluation shall fetch the participant the KARYASHALA course completion certificate. As per SERB guidelines, mandatory anonymous course feedback shall be taken in the stipulated format.

Registration & Guidelines

- ✓ The course will be completely free of cost for the shortlisted participants.
The participants will be limited to 25 candidates (as per SERB norms).
- ✓ The applicants shall produce an endorsement letter from their Head of the department indicating their enrolment with the institute and No Objection Certificate (NOC) for permitting to undergo training in the workshop if selected.
- ✓ All the selected participants will be given accommodation in the Institute.
- ✓ The participating students will be eligible for to-and-fro travel reimbursement for their journey to the host institute from their hometown/home institute (as per SERB norms).
- ✓ NITT reserves the right to devise a well-defined shortlisting criterion for selection of candidates based on the basic eligibility criteria laid out by SERB and as per formulated guidelines for this workshop.
- ✓ Please fill Google form for registration:
<https://tinyurl.com/UQ2022>



Scan to Register

Last date for registration: 09-07-2022
Notification to selected participants: 11-07-2022