



**Workshop on
HOLISTIC APPROACH FOR DESIGN, CONSTRUCTION,
AND MAINTENANCE OF RESILIENT ROAD PAVEMENT
INFRASTRUCTURE**

**Organized by Department of Civil Engineering,
National Institute of Technology, Tiruchirappalli
11th-15th December, 2023**

Overview

The structural design of pavements aims to protect the subgrade from traffic loads by providing pavement layers that will achieve a chosen level of service, with maintenance and rehabilitation during the analysis period, as cost effectively as possible. It encompasses factors of time, traffic, pavement materials, subgrade soils, environmental conditions, construction details and economics. The design procedures cover a range of flexible and semi-flexible (or semi-rigid) pavement types, environmental conditions, and materials currently used in practice. The basic process of road pavement design includes the type of road, bearing capacity of in-situ soil, analysis period, design traffic and climate conditions, and selection of pavement design. However, the typical basic design procedures do not include various factors important for developing resilient road pavement infrastructure. For instance, the influence of maintenance and rehabilitation requirements on the selection of pavement design or environmental and social issues arising from various pavement design alternatives, etc. One of the reasons for this exclusion can be attributed to students (future workforce) not being attuned to these requirements. Therefore, there is a need to develop a workforce that understands the complexity of road pavement design and is exposed to the holistic approach of pavement design. The holistic approach calls for integrated liaison and input between the personnel charged with the various functions in an organization so that they perform their tasks successfully.

The procedures for the structural design of road pavements presented in this course apply to heavily trafficked interurban roads and expressways as well as surfaced, lightly trafficked rural and rural access roads in India. They are based on a combination of existing methods, experience and fundamental theory

of structural and material behavior developed since the 1970s. The proposed procedures do not necessarily exclude other design methods.

Objectives

The course's primary objective is to train the future workforce t so as to equip them to produce a structurally balanced pavement structure of sufficient bearing capacity under the prevailing and future environmental conditions to fulfill the functional service level. This includes the design and maintenance predicted in the Life Cycle Assessment that it will be able to carry the traffic cost-effectively over the Structural Design Period in accordance with the Service Objective.

To achieve the aforementioned objectives, the course will cover the following topics:Design Philosophy and Process

- Road Category
- Pavement Design
- Design Traffic and Pavement Class
- Materials
- Environment
- Practical Considerations
- Structural Design and Pavement Type Selection
- Rehabilitation Design
- Pavement performance prediction
- Choice of M&R actions
- Life Cycle Assessment
- Case Studies

Modules

➤ **Modules:** Holistic Road Pavement Design Approach, Familiarization with Various Design Procedures Currently in Use, Laboratory session on characterization of Pavement Materials, Design Philosophy, Process and Definition of Road Category, Pavement Design (Bearing Capacity, Selection of Analysis Period and Structural Design Period), Problem solving session for striking a balance between the two periods, Design Traffic Classes and Equivalent Single Axle Loads, Materials Available for Road Pavement Design (subgrade, base, and surface materials), Problem solving session to demonstrate sensitivity of selected classes and axles on design, Influence of Environment on Road Pavement

	<p>Design, Practical Considerations (Drainage, Compactability, Problem Subgrade Material), Structural Design and Pavement Selection Type, Problem solving session with example: Demonstrate Influence of Environment on Pavement, Life Cycle Cost Assessment of Road Pavement Design, Life Cycle Environmental Assessment of Road Pavement Design, Case Studies.</p> <p>➤ Number of participants for the course will be limited to 40</p>														
Date of the course	11th - 15th December, 2023														
Who Can Attend	<p>➤ The programme is intended for faculty handling Transportation Engineering subjects for UG and PG in AICTE approved Engineering Colleges/Polytechnics, Scientists/Engineers from R&D establishments, Research Scholars and Post Graduate students.</p>														
Fees	<p>The participation fees for the course are as follows:</p> <table data-bbox="487 903 1380 1365"> <thead> <tr> <th colspan="2" style="text-align: right;">Course Fee (including GST 18%)</th> </tr> </thead> <tbody> <tr> <td>Faculty and Scientist</td> <td style="text-align: right;">Rs. 2500 /-</td> </tr> <tr> <td>Students / Research Scholars</td> <td style="text-align: right;">Rs. 1500 /-</td> </tr> <tr> <td>Industrial participants</td> <td style="text-align: right;">Rs. 5000 /-</td> </tr> <tr> <td>Students from Abroad</td> <td style="text-align: right;">US \$ 200 /-</td> </tr> <tr> <td>Faculty and scientist from Abroad</td> <td style="text-align: right;">US \$ 500/-</td> </tr> <tr> <td>Industrial Participants from Abroad</td> <td style="text-align: right;">US \$ 1000/-</td> </tr> </tbody> </table> <p>The above fee includes all course materials, computer use for tutorials and assignments, laboratory equipment usage charges, and internet facility.</p>	Course Fee (including GST 18%)		Faculty and Scientist	Rs. 2500 /-	Students / Research Scholars	Rs. 1500 /-	Industrial participants	Rs. 5000 /-	Students from Abroad	US \$ 200 /-	Faculty and scientist from Abroad	US \$ 500/-	Industrial Participants from Abroad	US \$ 1000/-
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Payment Procedure	<p>https://www.onlinesbi.sbi/sbicollect/icollecthome.htm → Accept the terms and conditions → State: Tamil Nadu → Type: Educational Institutions → select: Conference and Workshop NIT Trichy → Category: GIAN CIV DCMRRPI 2023 and provide details of payment and submit.</p>														
Registration Form	<p>How to Register?</p> <p>Stage-1: Web Portal Registration:</p> <p>Visit http://www.gian.iitkgp.ac.in/GREGN/index and create a login User ID and Password. Fill up the registration form and complete web registration by online payment of Rs. 500/-. This provides the user with lifetime registration to enroll in any number of GIAN courses offered.</p>														

Important Dates	<p>Stage-2: Course Registration:</p> <p>Login to the GIAN portal with the user ID and Password already created in Step 1. Click on Course Registration option at the top of Registration form. Select the Course titled “Holistic Approach for Design, Construction, and Maintenance of Resilient Road Pavement Infrastructure” to Confirm your registration by clicking on Confirm Course.</p> <p>Step – 3: Fill the google form using the link given below.</p> <p style="text-align: center;">https://forms.gle/8RKu6LievYonf8i57</p>
	<p>Last date for submission or Registration : 30th November 2023</p> <p>Confirmation of participation : 4th December 2023</p> <p>Workshop Dates : 11th – 15th December 2023</p>

ORGANIZING COMMITTEE

Dr. Vivek Tandon



Dr. Vivek Tandon is a Professor of Civil Engineering at the University of Texas at El Paso (UTEP), primarily focusing on sustainable transportation infrastructure development. He earned his Ph.D. in Civil Engineering (1994) from Pennsylvania State University, specializing in material modeling and evaluation. In 1990, he graduated from UTEP with a Master of Science in Civil Engineering, where he concentrated on non-destructive testing of highways, specifically pioneering a calibration system for falling weight deflectometers, a method subsequently adopted by the Texas Department of Transportation. Dr. Tandon's research revolves around the essential concept of fortifying communities through resilient infrastructure. His overarching objective is to boost productivity, reduce disruptions during adverse conditions, extend the lifespan of existing infrastructure, and diminish maintenance requirements. His primary area of expertise centers on developing and evaluating sustainable materials for highway infrastructure designed to lower the carbon footprint compared to traditional materials such as asphalt, aggregate, asphalt concrete, soils, and Portland cement concrete. In addition to his primary focus, Dr. Tandon also engages in several other critical areas: (i) assessing the impact of extreme climate events (e.g., flooding) on transportation infrastructure, (ii) utilizing computational tools to evaluate complex infrastructure materials, (iii) exploring sustainable development strategies for smart cities, and (iv) modeling and simulating infrastructure systems. Notably, Dr. Tandon has successfully secured funding for his projects from a range of prominent organizations, including the Texas

Department of Transportation, Department of Homeland Security, Federal Highway Administration, National Cooperative Highway Research Program, US Department of Transportation, and National Nuclear Security Administration. Collaborative efforts with faculty members from various departments and universities further advance the cause of sustainable development.

Dr. Samson Mathew



Dr. Samson Mathew is a Professor of Civil Engineering at National Institute of Technology, Tiruchirappalli, currently on deputation to National Transportation Planning and Research Centre (NATPAC) an R&D institute of Kerala State Council for Science, Technology and Environment (KSCSTE) as the Director. Formerly he was the Dean (Students Welfare), Dean (Institute Development) (i/c) and Dean (Planning and Development) (i/c) at NIT Tiruchirappalli. He has experience in diverse fields of Transportation, like Transportation Planning, Traffic Safety, Intelligent Transportation Systems, Pavement Engineering and GIS. He has successfully completed twelve research projects for Ministry of Human Resources Development, National Rural Road Development Agency, Ministry of Urban Development Govt. of India, Coir Board, etc. He was a member of State Technical Agency of Prime Minister Gram Sadak Yojana (PMGSY) program for Tamilnadu and Pondicherry. Dr. Samson has supervised Ten Ph.D students and 75 Post-graduate students. He has 60 refereed publications and 100 conference papers to his credit. He is also a member of several professional organisations such as Indian Roads Congress, Indian Society for Technical Education, Institute of Urban Transport, Institution of Engineers, and Transport Research Group of India. He has also visited Singapore, Netherlands, Hong Kong, Srilanka, Hungary, Republic of Korea and Thaiwan as a part of his academic programmes.

Dr. Sunitha V



Dr. Sunitha V completed B.Tech. in Civil Engineering from University of Calicut in 2001, M. Tech. in Traffic and Transportation Planning from NIT Calicut in 2003, and Ph.D. from IIT Madras in 2013. She joined National Institute of Technology, Tiruchirappalli in the year 2003 as a Research Associate and is currently working as Associate Professor. She has 20 years of experience in teaching. She has completed five sponsored projects worth Rs. 465 lakhs sponsored by Coir Board, Ministry of Urban Development,

and IIT, Madras; NRIDA and MSME. Currently, she is co-ordinating four sponsored projects worth Rs. 193 lakhs sponsored by NHAI, Coir board and NRIDA. She is one of the coordinators for the MHRD sponsored Centre of Excellence in Transportation Engineering (CETransE). She is the coordinator of State Technical Agency of Prime Minister Gram Sadak Yojana (PMGSY) program for Tamilnadu and Pondicherry. Her area of research interest is on pavement materials and pavement management systems. She has guided 83 Postgraduate and 18 Undergraduate project works in various fields such as Transportation Engineering, Transportation Planning, and Pavement Engineering. She also completed guiding 4 Ph.D. and two M.S. scholars and is currently guiding six Ph.D. scholars. She has published 90 papers in International/National journals and International/National conferences, out of which 25 Journal publications are SCI/Scopus indexed. She is also involved in Transportation related consultancy works. She is a member of professional bodies such as Indian Roads Congress, Institution of Engineers, Indian Geotechnical Society, ASCE, and TRG India. She is currently the coordinator for the M.Tech. programme in Transportation Engineering and Management.

Course Coordinators

Dr. Samson Mathew

Professor (On Deputation as Director, KSCSTE-NATPAC)

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