

# Advanced Bridge Design and Construction

## Overview

Bridges are a very important part of a nation's transportation infrastructure. Proper planning, design and construction, as well as maintenance, are of utmost importance. In general, engineers will benefit from exposure to sophisticated bridge typologies and construction practices, as well as the assessment of the existing bridges. The competency needed in this field has to be enhanced significantly and rapidly to respond to the requirements in large infrastructure projects being undertaken and planned in India. This course will extend the concepts and methodologies given in bridge engineering courses to cover the design of medium- and long-span road bridges, which can be optimized in terms of load-carrying capacity, durability, and ease of construction and maintenance. Good construction practices, site-specific issues and guidelines for drafting and enforcing specifications will also be covered. Case studies will be presented by industry experts to illustrate the technologies discussed.

Syllabus for the course: Review of bridge engineering and Indian standards for road bridges; India-specific design considerations and site issues; Typical bridge foundations; Bridge types in terms of the longitudinal layout: simply supported, continuous, framed, arch, cable stayed and suspension bridges; Concrete bridge types in terms of the cross-section: slab decks, girder-and-slab decks, box-girder decks; Bridge construction methods: scaffolding, span-by-span, incremental launching, balanced-cantilever; Introduction to reliability-based management of bridges; Design of concrete for strength and durability; Grouting of prestressing ducts; Case studies; and Industrial seminars.

<b>Dates for the Course</b>	<b>11<sup>th</sup> to 23<sup>rd</sup> July, 2016</b>
<b>Host Institute</b>	<b>Indian Institute of Technology (IIT) Madras</b>
<b>No. of Credits</b>	<b>2</b>
<b>Maximum No. of Participants</b>	<b>80</b>
<b>Objectives</b>	This is intended as an advanced bridge engineering course for research students, teachers and practising professionals. The participants should have attended a basic course in bridge engineering, and familiar with the basic codes for road bridges. The exposure to state-of-the-art practices in the international level is expected to challenge the students and professionals to think beyond conventional design, and to implement optimized solutions that can compare with the best bridges in the world.
<b>You Should Attend If...</b>	<ul style="list-style-type: none"> <li>▪ You are a student doing research in analysis, design, durability and assessment of bridges.</li> <li>▪ You are an instructor teaching topics related to bridge engineering.</li> <li>▪ You are a practising professional involved in planning, management, design, construction and maintenance of bridges.</li> <li>▪ You are a scientist or consultant offering services in investigation, inspection and rehabilitation of bridges.</li> </ul>
<b>Course Registration Fees</b>	The participation fees for taking the course is as follows: <b>Student Participants:</b> Rs. 2000, <b>Faculty Participants:</b> Rs. 8000, <b>Industry Participants:</b> Rs. 20,000 The above fee is towards participation in the course and the course material. <b>Mode of payment: Demand draft in favour of "Registrar, IIT Madras" payable at Chennai</b> The participants are encouraged to pre-register. Spot registration may not be possible.
<b>Accommodation</b>	The participants may be provided with hostel accommodation, depending on the availability, on payment basis. Request for hostel accommodation may be submitted through the link: <a href="http://hosteldine.iitm.ac.in/iitmhostel">http://hosteldine.iitm.ac.in/iitmhostel</a>

## Course Faculty



**Prof. Joan Ramon Casas** has taught in the School of Civil Engineering, Technical University of Catalonia (UPC), Spain, since 1984. His research interests include design and construction, safety and durability, reliability-based inspection and management, repair and strengthening with advanced materials, and structural health monitoring of bridges. He is the Secretary General of the International Association for Bridge Maintenance and Safety, since 1999. He is co-author of 12 books and 8 book chapters, 83 papers in refereed journals and over 200 communications to scientific meetings. He has participated in more than 100 consultancy projects related with bridges.



**Prof. Ravindra Gettu** has been with the Department of Civil Engineering, IIT Madras, since 2004. His research interests include concrete technology, effective use of admixtures, self compacting concrete, and fibre reinforced concrete. He has co-authored more than 400 scientific and technical publications. He is the Vice President of RILEM, the International Union of Laboratories and Experts in Construction Materials, Structures and Systems.



**Prof. Amlan K. Sengupta** has been in the Department of Civil Engineering, IIT Madras, since 2002. His research interests include behaviour of reinforced and prestressed concrete members, analysis, design and seismic retrofit of buildings, and assessment of bridge decks for deterioration.

*Experts from leading institutions and companies will give guest lectures.*

## Course Coordinators

**Name: Ravindra Gettu**

Phone: (044) 2257 4266 / 5255

E-mail: [gettu@iitm.ac.in](mailto:gettu@iitm.ac.in)

**Name: Amlan K. Sengupta**

Phone: (044) 2257 4277

E-mail: [amlan@iitm.ac.in](mailto:amlan@iitm.ac.in)

**Address:**

Department of Civil Engineering  
Indian Institute of Technology Madras  
Chennai 600036

URL: <http://www.iitm.ac.in>



In Association with the  
Indian Concrete Institute