Dr. Anil Patnaik is a professor of structural engineering at The University of Akron in Ohio, USA. He earned his Ph.D. from the University of Calgary, and Master's degree in Structural Engineering from the Indian Institute of Technology in Kanpur, and a Bachelor's degree in Civil Engineering from National Institute of Technology, Rourkela in India. He has over twenty years of experience in academic positions at South Dakota School of Mines and Technology (SDSM&T) in Rapid City, Curtin University in Perth (Australia), the University of Western Australia, and presently is working at the University of Akron in Ohio. His area of research includes corrosion of reinforced concrete and steel structures, reinforced concrete members subjected in impact loads; fiber reinforced polymer (FRP) materials for structural concrete applications; repair and strengthening of existing structures; construction; carbon footprint assessment and life cycle analysis (LCA). He is the author or co-author of over 100 technical papers, and over 100 research and design reports. He edited a book on high volume fly ash concrete and co-edited a book on high performance high strength concrete. He has several years of experience as a practicing engineer in design and construction of large industrial, commercial and offshore structures, and tall buildings

Host Faculty/Course coordinator

Dr. Bibhuti Bhusan Das is currently serving as Associate Professor at National Institute of Technology Karnataka, Surathkal since May 2015. Prior, he was serving as a Senior Associate Professor and Centre Head at National Institute of Construction Management and Research (NICMAR), Goa campus. He has been working as a Post-Doctoral Research Associate and Adjunct Professor in the Department of Civil Engineering at Lawrence Technological University, Southfield, Michigan, USA. His area of research includes project management, microstructure characterization of materials, non-destructive testing of concrete structures, corrosion of reinforcement and durability studies on concrete.

About NITK

National Institute of Technology Karnataka (NITK) Surathkal is located in Mangalore (also called Mangaluru) City, Karnataka State, India. NITK is a centrally funded technical institute and was established in the year 1960. NITK is a premier institution engaged in imparting quality technical education and providing support to research and development activities. NITK is recognized as an institute of national importance by an act of Indian parliament. NITK has carved a niche for itself among the best technical institutions in India. NITK has been consistently ranked among the top ten technical institutions in the country. Today, the institute offers 9 B.Tech, 27 post graduate and doctoral programmes in all its 14 Departments and is making significant advances in R&D and outreach activities. NITK is probably the only institution in the country which can boast of its own beach.

About the Department

The Department of Civil Engineering is the one of the oldest departments of this institute, which established in the year 1960. The department presently offers one B.Tech, six post graduate and doctoral programmes in various disciplines. The department has well experienced faculty, skilled technical staff and well equipped laboratories. It is recognised QIP centre for training of faculty from other engineering colleges and polytechnics. The department has been always in the forefront in taking up R&D initiatives and industrial consultancy assignments.

For more information:

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NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL, MANGALORE – 575025

Government of India
Ministry of Human Resource Development

A Five Day

GIAN
GLOBAL INITIATIVE OF ACADEMIC NETWORKS

Course on

Design of Concrete Structures Reinforced with Fiber Reinforced Polymer (FRP) Bars

29th July – 2nd August 2019

Call for Registration and Participation

Resource Person

Dr. Anil Patnaik

Professor of Structural Engineering and
Associate Department Chair (Graduate Programs)
Dept of Civil Engineering, The University of Akron, Akron.

Course coordinator

Dr. Bibhuti Bhusan Das

Organised by

Department of Civil Engineering
National Institute of Technology Karnataka, Surathkal,
Mangalore-575025, Karnataka, India

Course Overview

Reinforced concrete is a common building material that is versatile and economical in civil engineering structures. In most circumstances, reinforced concrete is strong and durable providing maintenance-free service over a long life span. However, corrosion of steel reinforcement embedded in concrete is a problem particularly in coastal and saline environments. Therefore, non-corroding bars made from structural composites that are made from fibers and polymer binders called Fiber Reinforced Polymer (FRP) reinforcement have been introduced to the industry in the last two decades. In recent times, the use of FRP reinforcement has been demonstrated to be beneficial for structures that are exposed to deicing salts such as pavements, bridge decks and bridge superstructures, and for structures in highly corrosive environment such as those in water treatment plants, seawalls and other marine structures. Glass, carbon and aramid fiber are commonly used fibers in composites (GFRP, CFRP and AFRP) to manufacture reinforcing bars. Significant research is documented in ACI 440R (State of the Art Report on FRP reinforcement for Concrete Structures) and ACI 440.1R (Guide for the Design and Construction of Structural Concrete Reinforced with FRP Bars). There have been more than 100 demonstration or commercial projects in the United States and overseas that successfully demonstrated the use of FRP bars in reinforced concrete structures (ACI 440.1R).

There are several advantages of using FRP bars as reinforcing material in concrete structures. High strength, light weight, non-magnetic and non-corrosive properties, and high fatigue endurance are among the most favorable properties that would encourage their use. High initial cost, low modulus of elasticity, linear stress-strain behavior until failure, lack of insight into durability issues, and general skepticism of practicing engineers are some of the common obstacles to wide spread adoption of FRP materials in structures. Despite some of the disadvantages, the use of FRP bars as internal reinforcement in place of steel reinforcement in concrete bridge decks and water treatment plants (which are highly corrosive), is attractive to reduce the deterioration of such structures due to corrosion. FRP reinforcing bars are particularly useful in highly corrosive environments such as those in waterfront structures, and structures supporting magnetic resonance imaging (MRI) units in hospitals.

This course will provide an overview of material and mechanical properties of FRP reinforcing bars, structural applications, construction practices, design philosophy, flexural behavior, serviceability, shear behavior, and detailing issues. The course will be beneficial to asset managers, design engineers, concrete specifiers, consultants, builders, and researchers.

Course Objectives

Successful completion of the course will lead to the following learning outcomes:

Knowledge and understanding of:

(1) concepts related to the use of structural composites in civil engineering structures
(2) physical and mechanical properties of different types of composites
(3) flexural design of FRP reinforced concrete members
(4) advantages and disadvantages of the use of FRP in the construction industry.

Intellectual Abilities to:

(1) design concrete elements and structures using FRP internal reinforcement
(2) identify structural applications where it is beneficial to use FRP internal reinforcement and where to avoid the use of such reinforcement
(3) distinguish between the designs of cost-critical and performance-critical structures.

Practical Skills: to design concrete members reinforced with FRP internal reinforcement and make decisions on when and where to adopt FRP internal reinforcement in place of steel reinforcing bars.

Who can participate?

Executives, engineers (government, PSU and Private) and researchers from manufacturing, service and government organizations including R&D laboratories.

Students at all levels (B.Tech/M.Sc/M.Tech/Ph.D) or Faculty from academic institutions and technical institutions.

Registration Process

Stage-1: Web Portal Registration: Visit http://www.gian.iitkgp.ac.in/GREGN/index and create login User ID and Password. Fill up the blank registration form and do web registration by paying Rs. 500/- online through Net Banking/Debit/Credit card. This provides the user with life time registration to enrol in any number of GIAN courses offered.

Stage-2: Course Registration: 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 "Design of Concrete Structures Reinforced with Fiber Reinforced Polymer (FRP) Bars" from the list and click on SAVE option. Confirm your registration by clicking on Confirm Course.

Selection and Mode of Payment

On registration in the course, selected candidates will be intimated through e-mail. They have to remit the required course fee through DD drawn in favour of Director, NITK Surathkal, payable at Surathkal.

In addition to the above fee, one-time online fee of Rs. 500/- is to be paid for registration in the GIAN web portal. (See registration process stage 1)

Registration/Course Fee (Non-refundable)

Participants from abroad: US $100 (students), US $200 (others)
Industry/ Research Organizations: Rs. 5000/-
Academic Institutions: Rs. ₹ 1500 (students), Rs. ₹ 3000 (others)

Note: Maximum number of Participants: 50 (Participants will be selected on first-cum-first serve basis). The Registration fee includes instructional materials and tutorials.

Accommodation

Out station participants can be provided accommodation in the Institute Guest Houses (limited accommodation on first-cum-first serve basis) inside the campus on direct payment. The Registration fee does not include lodging and boarding.

National Institute of Technology Karnataka, Surathkal

MHRD Scheme on Global Initiative for Academic Networks (GIAN)

Advance Level Course

On

"Design of Concrete Structures Reinforced with Fiber Reinforced Polymer (FRP) Bars"

Duration: 29-07-2019 to 02-08-2019

Registration Form

1. Name of applicant: _____

2. Designation & Department: _____

3. Mailing Address: _____

_____

_____ (Mobile): _____

5. Email: _____

6. Qualification: _____

7. Experience: Teaching: _____ and Industrial: _____

8. Comment on your exposure: _____

9. Fee Payment Details

Amount Rs: _____ Demand Draft No. : _____

Bank: _____ and Date: _____

10. Category of participants:

[ ] Faculty/Student/Research scholar of NITK

[ ] Faculty/Student/Research scholar of Outside NITK

[ ] Industry/Research Organizations

11. Require accommodation Facility? : Yes / No

I agree to abide by the rules and the regulations governing the GIAN–MHRD Course and I will attend the course for entire duration.

Place:

Date:

Signature of the applicant

Note: 1. Filled registration form with Demand Draft should be send to the course coordinator.
2. Demand draft drawn in favour of Director, NITK Surathkal, payable at Surathkal