

Dynamic Response of Advanced Composites

(171034L01) December 10-14, 2018

Overview

The overarching goal of this course is to disseminate cutting-edge technology and research in the field of advanced composites. There is significant interest in both military and civilian sectors in designing composite materials for mitigating dynamic loading such as impact, blast and vibration. These conditions are very challenging because the fundamental material behavior under these very small duration loading conditions is very different from the static loading conditions such as tension and compression. In Indian scenario with concentrated focus on SKILL DEVELOPMENT and MAKE IN INDIA initiative of GOI, transportation sector will especially benefit from the expertise shared by the speaker on understanding the dynamic loading conditions and principles of designing composite materials to mitigate those conditions.

Course participants will learn these topics through lectures and hands-on exercises. Also case studies and assignments will be shared to stimulate research motivation of participants.

Objectives

The primary objectives of the course are as follows:

- i. Exposing participants to state of the art in the principles of dynamic loading conditions including impact, blast, and high strain rate compression and laboratory scale test methods.
- ii. Enlightening the participants to the response of composite materials to dynamic loading conditions and principles of designing composites for such loading conditions.
- iii. Providing insight into the requirements of industries, like, automotive, aerospace and civil structures, for advanced composite materials for damage mitigation.
- iv. Enhancing the capability of participants to apply the design principles to develop composite materials for specific applications and loading conditions.
- v. Providing exposure to practical problems and probable solutions through case studies.

Modules	<p>Lectures : Dynamic loading conditions, Advanced composites, Impact on composite structures, Composite materials for blast mitigation, Interaction of blast with composite materials, Vibration response of composite materials, Measurement of mechanical properties from vibration response, High strain rate response of composite materials</p> <p>Tutorials : Theoretical models used for estimating modulus and strength for porous composite materials, Finite element analysis of impact problems using Autodyn or LS-Dyna, Digital image correlation technique for strain measurement in dynamic experiments, Vibration test setup to measure the mechanical properties, Analysis of high speed imaging data to understand the methods of measuring strain rate and strain</p> <p style="text-align: center;">Number of participants for the course will be limited to Fifty. The last date to apply for the course is October 31, 2018 (Wednesday)</p>
You Should Attend If...	<ul style="list-style-type: none">• Executives, engineers and researchers from manufacturing, service and government organizations including R&D laboratories and industry.• Student students at all levels (B.Tech/M.Sc./M.Tech/Ph.D).• Post-doctoral fellows and Faculty from reputed academic and technical institutions who are engaged in teaching and research related to composite materials and mechanics fields.
Fees	<p>Participants from abroad : USD 500 Industry participants : INR 10,000 Faculty/Research staff from other Institutions : INR 5,000 PhD scholars/Students from other Institutions : INR 3,500 Faculty/PhD scholars/Students from NITK : INR 2,000</p> <p>The above fee includes all instructional materials and working lunch. The outstation participants will be provided with limited accommodation (shared) on payment basis.</p>
Steps for Registration	<p>(i) Prospective participants have to register first on GIAN Portal (http://www.gian.iitkgp.ac.in/GREGN/index) by paying Rs. 500/- (One time non-refundable GIAN Portal registration fee).</p> <p>(ii) Select the course from the list of courses available in the portal. Register for the course selected.</p> <p>(iii) Fill and submit the registration form available at https://goo.gl/forms/bJC6GcQAorlt9DMl2</p> <p>(iii) Mode of payment: DD for registration fee in favour of the Director NITK Surathkal, payable at Surathkal/Mangalore through any Nationalized Bank. DD must reach to Dr. Mrityunjay Doddamani, Assistant Professor, Mechanical Engineering, National Institute of Technology Karnataka, Surathkal, PO Srinivasnagar 575025, Mangalore, Karnataka by post on or before 16th November 2018.</p>

The Faculty



Prof. Nikhil Gupta

Prof. Nikhil is an Associate Professor (2010-present) in Department of Mechanical and Aerospace Engineering at New York University, Brooklyn, New York. He is also Chief Technology Officer of 3DP Security, Inc. (2016-present). Dr. Gupta is known for his pioneering work in the area of syntactic foam composites and, most recently, 3D printing and related cyber security issues. He has over 150 research articles in international journals and book chapters of high repute to his credit. He is also founder and CTO of two startup companies. He is also inventor on 3 issued patents and 7 filed patents. He has **h-index of 41** with over 5350 citations (as on 10th June 2018). He has research funding of USD 4.6 million. He is a member of editorial board of many renowned journals, to name a few Composites Part B, Materials Science and Engineering A, JOM, ASTM Materials Processing and Characterization, Advanced Composites and Hybrid Materials. He is currently chairing Composite Materials Committee of TMS and is a member of Committee of Publications of ASTM. In addition, he is founder of two symposia series “Metal and Polymer Composites” and “Additive Manufacturing of Complex and Composite Materials” in Materials Science and Technology conference in USA. His work has been featured on Discovery Channel, Scientific American, National Geographic, Reuters, PBS TV, NBC Learn and many other videos.

Course Co-coordinators



Dr. Mrityunjay Doddamani



Dr. P. Jeyaraj

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GIAN web link : <http://www.gian.iitkgp.ac.in/GREGN>

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