One-Week Course

on

MANUFACTURING AND CHARACTERIZATION OF COMPOSITES

(Course Code: 191033L01)

02-06 January, 2023

Under

MINISTRY OF EDUCATION SCHEME

on

GLOBAL INITIATIVE ON ACADEMIC NETWORK (GIAN)

Course Instructors:

Dr. Harshit K. Dave

Associate Professor,
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Professor,
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Organized by

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Overview:

In recent years, composite materials have been extensively used in automotive sector, aerospace and other associate industries because of its versatile properties. Use of composite material in space and defense application has been increased in two last decades. This scenario leads Research and Development program carried out globally in field of composite materials. Numerous applications of these materials can be found in aerospace industries due to its cost effectiveness; in automobile sectors composite offers lightweight and fuel efficient vehicle; in field of marine composite provides lighter boat hulls with more damage resistances. Composite material is also benefiting various field viz. Architecture, energy, infrastructure, transportation, sport and recreation and pipe and tanks. In India R&D organizations and educational institutes are involved in research and development in the field of composite materials. So basic understanding and information regarding state of the art in this area is very important and need to be conveyed to students, faculty and researchers.

This program is intended for university students, faculty and researchers having interest in composite materials. The one-week course will focus on fabrication and analysis of the composite materials. The fundamental behavior of the composite materials will be highlighted. Course participants will learn topics through lectures and tutorials. In addition, demonstration and assignments will be carried out to stimulate research interest of participants.

Objectives:

The primary objectives of the course are as follows:

i) Exposing participants to the fundamentals of composites,

ii) Understand the various elements of composite manufacturing processes,

iii) Building in confidence and capability amongst the participants to analyze the behavior of composites under mechanical loading,

iv) Providing exposure to the participant for fabrication and mechanical testing of composites through practical demonstration,

v) To enhance the capability of the participants to identify and manage relevant research in composite materials.

You should attend if you are…..

(i) Faculty from reputed academic institutions and technical institutions.
(ii) Executives, engineers and researchers from manufacturing, service and government organizations including R&D laboratories.
(iii) Students at all levels (B.Tech./ MSc/ M.Tech./ Ph.D.) & Personnel from Startups.

Last Date of Registration: **30 December, 2022**

Date of Examination: **06 January, 2023**

Modules:

Module 1 : **Introduction to basic concepts and materials of composites**

Short history of composite materials; Advantages/Disadvantages of composite materials; General classification of composite materials; Reinforcement materials; Matrix materials.

Module 2 : **Manufacturing of polymer matrix composites**

Metal matrix composite; Ceramic matrix composites; Processing of polymer matrix composite; Hand layup technique; Resin transfer moulding; Vacuum-assisted resin injection/transfer; The gas/liquid transfer of the reinforcing particles.

Module 3 : **Manufacturing of hybrid composites and sandwich composites**

Processing of polymer hybrid composite; Biodegradable Composite Materials; Technology and properties of liquid wood; Sandwich structure origins; Types of sandwich structures; Fabrication of sandwich composite; 3D Printing of polymer composite.

Module 4 : **Characterization of composites**

Introduction; Measurement of physical properties; Measurement of mechanical properties; Damage identification.

Steps for Registration:

Please follow the steps below for registering in the GIAN program '*MANUFACTURING AND CHARACTERIZATION OF COMPOSITES'*

Step 1: Register at the GIAN portal on the link http://www.gian.iitkgp.ac.in/ by clicking on 'Course Registration/ Participant Login'

Step 2: It shall state – 'Registration to the portal is one-time affair and will be valid for life time of GIAN'. Once registered in the portal, an applicant will be able to apply for any number of GIAN courses as and when necessary. One-time Non-refundable fee of 500 /- INR is to be charged for this service. (Please do not confuse with web registration with course registration. The course registration fee is separate.)

Step 3: Once done with registration, please select the course '*MANUFACTURING AND CHARACTERIZATION OF COMPOSITES'* from the list of courses and confirm it.

Step 4: Send the copy of registration details from GIAN website to the following email: mfg.svnit@gmail.com

The shortlisted candidates will be informed through email regarding the modalities to pay the registration fee.

Registration Fees:

Participants from abroad: USD 60

Industry/ Research Organizations: Rs. 4130/-*

Faculty from Academic Institutions: Rs. 1770/-*

Research Scholars/Students; Personnel from Startups: Rs. 885/-*

(*Inclusive of 18% GST)

The above fee includes all instructional materials and virtual laboratory use for tutorials and assignments. Number of participants for the course will be limited to 50.

Course Instructors:

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Dr. Dumitru Nedelcu is a Professor at the "Gheorghe Asachi" Technical University of Iasi (TUIASI), Romania, Director of TUIASI Doctoral School. He is Manager of Fine Mechanics and Nanotechnology Laboratory, President of ModTech Professional Association, ModTech International Conference and Editor-in-Chief of the International Journal of Modern Manufacturing Technologies and Advanced Engineering Forum. He was a Visiting Professor at TAT, Institute of Engineering, Tokyo, Guest Professor at Osaka University, Japan and Grenoble Institute of Technology, France. He had Erasmus teaching internships in prestigious universities from Poland, Italy and Mexico. In October 2016 he was accepted as Visiting Professor at the Silesian University of Technology, Gliwice, Poland. As far as research is concerned, he coordinated 15 national and international projects as project manager/responsible. He has published more than 180 scientific papers on ISI and BDI journals and international conferences proceedings.

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Dr. Harshit K. Dave is currently Associate Professor at the Department of Mechanical Engineering, S. V. National Institute of Technology, Surat, India. His research interests include Additive Manufacturing Processes; 3D printing filaments & raw materials; Composite manufacturing; 3D printing of composites; Unconventional Machining processes; Micro machining processes; Modeling & optimization of machining processes; Robotics & Automation. He has published more than 100 papers in reputed international journals and conferences proceedings. He has successfully carried out several research projects funded by the DST, MHRD, GUJCOST, NPIU, etc.