



सत्यमेव जयते  
Ministry of Education  
Government of India

**One-Week Course**  
(on campus mode)

on

**MANUFACTURING AND CHARACTERIZATION  
OF COMPOSITES**

*(Course Code: 191033L01)*

*03 – 07 July, 2023*

Under

**MINISTRY OF EDUCATION SCHEME**

on

**GLOBAL INITIATIVE ON ACADEMIC NETWORK (GIAN)**

**Course Instructors:**

**Dr. Harshit K. Dave**

Associate Professor,  
Sardar Vallabhbhai National  
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**Dr. Dumitru Nedelcu**

Professor,  
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Organized by

**Department of Mechanical Engineering,  
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Ichchhanath, Surat - 395007, Gujarat, INDIA**

### **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) to expose participants to the fundamentals of composites,
- ii) to understand the various elements of composite manufacturing processes,
- iii) to build in confidence and capability amongst the participants to analyze the behavior of composites under mechanical loading,
- iv) to provide 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: 31 May, 2023**

**Date of Examination: 07 July, 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 molding; 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](mailto:mfg.svnit@gmail.com) / [hkd@med.svnit.ac.in](mailto:hkd@med.svnit.ac.in)

**The shortlisted candidates will be informed through email regarding the modalities to pay the registration fee. It is compulsory to attend all sessions in person. Online mode of attendance is not permissible.**

## **Registration Fees:**

Industry/ Research Organizations	:	Rs. 5900/-*
Faculty from Academic Institutions	:	Rs. 2360/-*
Research Scholars/Students; Personnel from Startups	:	Rs. 1180/-*

(\*Inclusive of 18% GST)

**The above fee includes all instructional materials as well as working lunch and refreshment. Accommodation on sharing basis is available on prior booking at institute guest house on payment basis.**

## 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 120 papers in reputed international journals and conferences proceedings. He has successfully carried out several research projects funded by the DST, MHRD, GUJCOST, NPIU, etc.