

## Overview of the Course

Since the first demonstration in 1960s, lasers have found applications in diverse fields such as engineering, medicine, and electronics. With the expansion of commercial applications for ceramics, composites and high strength alloys, processing of these materials at industrial scale has become a prime area for research. This course provides a comprehensive overview of the principles and applications of lasers in manufacturing, assisting conventional machining processes, micromachining, metal forming, and surface engineering. The course is unique in presenting both the physics and engineering aspects, including a brief overview of the state of the art research in laser processing. The lectures are complemented with practice sessions that provide the participant a hands-on experience in analyzing laser machining processes.

### Course Contents:

#### Module A: Fundamentals of Laser Processing

- Introduction to Lasers, Properties of Laser Radiation, Types of Industrial Lasers
- Laser Material Interactions & Analysis of Thermal Effects of Laser-Material Interactions

#### Module B: Lasers in Manufacturing-1

- Lasers in Manufacturing and Selection of Manufacturing Processes
- Laser Drilling, Laser Cutting and Advances
- Analysis of Material Removal in Laser Machining Processes

#### Module C: Laser in Manufacturing-2

- Three-dimensional Laser Machining and Advances
- Laser Micromachining & Modeling and Simulation of laser-material interactions

#### Module D: Laser Surface Engineering

- Laser Surface Engineering Processes
- Modeling and simulation of laser-material interactions

#### Module E : Advanced Topics in Laser Processing

- Vibration-assisted Laser Drilling of Materials
- Vibration-assisted Laser Surface Engineering of Material & Advanced Topics in Laser Processing



Dr. Sandip P. Harimkar is an Associate Professor at school of Mechanical and Aerospace Engineering, Oklahoma State University. His research interests are spark plasma sintering of materials,

laser processing of materials, pulsed electro deposition, surface engineering, advanced ceramics and amorphous coatings. He is one of the well-known investigators in the area of laser processing of materials. He received several awards and research grants. He co-authored a book titled "Laser Fabrication and Machining of Materials" and contributed three book chapters. He published around 80 Journal papers..

### Who can participate?

This program is open to the Faculty, PG and Research students of Mechanical Engineering from various Institutes. Practicing Engineers from industries can also participate.

## How to Register?

### 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 enroll 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 Stage 1. Click on Course Registration option at the top of Registration form. Select the Course titled "Laser Processing of Material" from the list and click on Save option. Complete your registration by clicking on 'Confirm Course'.

## REGISTRATION FEE:

Faculty (Internal & External) & Scientists from R&D Labs	Rs. 2,000/-
Persons working in Industry/ Consultancy firms	Rs. 4,000/-
Students & Research Scholars <ul style="list-style-type: none"><li>• Without award of Grade</li><li>• With award of Grade</li></ul>	Rs. 1,000/- Rs. 1,500/-
Students from abroad	\$ 50
Faculty/Scientists/Persons working in Industry and Consultancy firms from abroad	\$ 100

The Registration fee includes instructional materials, tutorials, laboratory and computer use and free internet facility. The participants will be provided with boarding and lodging in Visitors Block on twin sharing basis on additional payment of Rs 4000/-.

## Selection and Mode of Payment

Selected candidates will be intimated through e-mail. They have to remit the necessary course fee to the Bank as per the details given below.

**Outstation participants requiring Lodging and Boarding facilities have to pay Rs. 4,000/- in addition to the course fee.**

Account Name	GIAN NITW
Account No.	62447453600
Bank	State Bank of India
Branch	REC Warangal (NIT Campus)
Branch Code	20149
IFSC	SBIN0020149
MICR Code	506002030
SWIFT Code	SBININBBH14

Candidates registering early will be given preference in short listing process.

For any queries regarding registration of the course and accommodation, please contact the Course Coordinators:

### Dr. P. Vamsi Krishna

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## About GIAN Course

MHRD, Govt. of India has launched an innovative program titled “Global Initiative of Academic Networks (GIAN)” in higher Education, in order to garner the best international experience. As part of this, internationally renowned Academicians and Scientists are invited to augment the Country’s academic resources, accelerate the pace of quality reforms and elevate India’s scientific and technological capacity to global excellence.

## About the Institute and Warangal

National Institute of Technology, Warangal (NITW) formerly known as RECW is the first among seventeen RECs set up in 1959. Over the years, the Institute has established itself as a premier Institution in imparting technical education of a very high standard, leading to B.Tech, M.Tech and Ph.D. programmes in Science and Engineering streams.

Warangal is known for its rich historical and cultural heritage. It is situated at a distance of 140 km from Hyderabad. Warangal is well connected by rail and road. National Institute of Technology, Warangal campus is 2 km away from Kazipet railway station and 12 km away from Warangal railway station.

## ABOUT THE DEPARTMENT

The Department of Mechanical Engineering was established in the year 1959. The Department offers one UG program and seven PG programs. The Department has experienced faculty and well-established laboratories. The Department has liaison with reputed industries and R&D organizations like NFTDC, BHEL, DMRL, DRDL, ARCI, Praga Tools GTRE, etc. Presently the Department is handling several R&D and consultancy projects. The Department has been recognized as QIP centre for M.Tech and Ph.D.



**A Five Day**

**GIAN Course on**

**Laser Processing of Materials**

**July 22 – 26, 2019**

**Call for Registration and Participation**

**International Faculty**

**Dr. Sandip P. Harimkar**

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School of Mechanical and Aerospace  
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**Course Coordinators**

**Dr. P. Vamsi Krishna**

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