

## OVERVIEW OF THE COURSE

3D printing is defined by the ASTM F42 committee as the fabrication of objects through the deposition of a material using a print head, nozzle, or other printer technology. However, the term is often used synonymously with additive manufacturing (AM). 3D Printing is used to build physical models, prototypes, patterns, tooling components, and production parts in plastic, metal, ceramic, glass, and composite materials. 3D Printing systems use thin, horizontal cross sections from computer-aided design (CAD) models, 3D-scanning systems, medical scanners, and video games to produce parts in about every shape imaginable. Design and manufacturing organizations use 3D Printed parts for products in the consumer, industrial, medical, and military markets, to name just a few. Digital cameras, mobile phones, engine parts, interior trim for automobiles, parts and assemblies for airplanes, power tools, and medical implants are just the beginning of a very long list of products that have benefited from 3D Printing technology.

This course will provide a clear and comprehensive coverage of this exciting new technology.

## COURSE CONTENTS

- Design for 3D Printing & Additive Manufacturing
  - ❖ Overview of 3D Printing & AM
  - ❖ Modelling of CAD designs, working with STL files, support structure generation and build setup preparation
- 3D Printing & AM Processes
  - ❖ Vat Photopolymerization
  - ❖ Material Jetting
  - ❖ Binder Jetting
  - ❖ Extrusion-based
  - ❖ Powder Bed Fusion
  - ❖ Directed Energy Deposition
  - ❖ Sheet Lamination
- 3D Printing & AM Applications
  - ❖ Prototyping and Tooling Applications
  - ❖ Automotive, Aerospace, Medical & Dental Applications
  - ❖ Toys and Gaming Industries
  - ❖ Business Opportunities and Future Directions of 3D Printing & AM

## ABOUT PROF. IAN GIBSON



**Prof. Ian Gibson** is in the faculty of Deakin University, Australia. He is responsible for a number of initiatives aimed at promoting and supporting 3D Printing (3DP) research and development. He co-founded the Rapid

Prototyping Journal, which remains the primary research publication in the field. He co-established the Global Alliance of Rapid Prototyping Associations, which provides leverage for 3DP-evangelists around the world. He has published widely, including 50 top journal papers, 3 books and more than 20 book chapters. He is probably most proud of the Additive Manufacturing book published through Springer that has been adopted by course managers in many universities. At Deakin he is extremely excited by the new and groundbreaking Centre for Advanced Design and Engineering Training, which aims to revolutionize the way we educate engineering students and prepare them for the industrial landscape of tomorrow.

## 3D PRINTING AT NIT WARANGAL



## WHO CAN PARTICIPATE?

- 1) Faculty members working in Engineering Colleges in Mechanical, Production, Industrial Engineering, Design and allied Departments.
- 2) Participants from Training Organizations/R&D Organizations/ Consultancy firms/ Industries.
- 3) Students and Research Scholars working in the area of 3D Printing and Additive Manufacturing.

## HOW TO REGISTER?

**Stage – 1: Web (Portal) Registration:** Visit GIAN Website at the link:

<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 him/her with life time registration to enroll in any number of the GIAN courses offered.

**Stage – 2: Course Registration (Through GIAN Portal):** Log in to the GIAN portal with the user ID and Password created. Click on “**Course Registration**” option given at the top of the registration form. Select the Course titled “**3D Printing & Additive Manufacturing**” from the list and click on “**Save**” option. Confirm your registration by Clicking on “**Confirm Course**”.

## REGISTRATION FEE (Excluding Lodging & Boarding)

Faculty & Scientists	<b>Rs. 4,000/-</b>
Participants from Industry/Training Organizations/Consultancy Firms	<b>Rs. 8,000/-</b>
Students and Research Scholars	
➤ Without Award of Grades	<b>Rs. 500/-</b>
➤ With Award of Grades	<b>Rs. 1,000/-</b>
Student Participants from Abroad	<b>USD 50</b>
Other Participants from Abroad	<b>USD 100</b>

The registration fee includes instructional materials, tutorials, laboratory and computer use, free internet facility, working lunch, mid-sessions tea & snacks. Outstation participants will be provided accommodation and boarding in Visitors Block/Hostel in the campus on payment.

## 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:

Account Name	GIAN NITW
Account Number	62447453600
Bank	State Bank of Hyderabad
Branch	REC Warangal (NIT Campus)
Branch Code	20149
IFSC	SBHY0020149
MICR Code	506 004 011
SWIFT Code	SBHYINBB018

**\*Last Date for registration is June 4<sup>th</sup>, 2016**

Outstation participants requiring accommodation and boarding facilities have to pay extra at the guest house in addition to the course fee with the following rates:

- A/C Room Rs. 150/- (or) Rs. 250/- (or) Rs. 500/- per day (Triple/Double/Single sharing)
- Dinner @ Rs.100/-, Breakfast @ Rs. 50/-

## CONTACT DETAILS

**Dr. Y. Ravi Kumar**

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3D Printing & Additive Manufacturing  
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## ABOUT THE GIAN COURSES

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 expertise into our system. As a 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 (formerly Regional Engineering College), Warangal was established in 1959. Over the years it has developed into a premier Institution of higher learning and is ranked among the top technical education Institutions in India. There are 14 Departments offering eight undergraduate and 29 post-graduate programmes besides doctoral programmes. About 5,000 students across the country and about 500 international students pursue their education in the campus. It is a fully residential campus sprawling over 250 acres with excellent infrastructure in the form of state of art library, seminar halls, guest houses and laboratories.

Warangal is the second largest city of the new state of Telangana. It is situated at a distance of 140 Km from the state capital Hyderabad (Nearest Airport). It is well connected by Rail (Kazipet Junction is 2 km away and Warangal Station is 12 Km away) and by Road (NH 202). Warangal is known for its rich historical and cultural heritage. It was the seat of erstwhile Kakatiya dynasty. It is the place of tourist attraction with a number of historical monuments like Thousand Pillars Temple, Warangal Fort, Bhadrakali Temple, Ramappa Temple and Laknavaram Lake.

## ABOUT DEPARTMENT

The Department of Mechanical Engineering offers an undergraduate program in Mechanical Engineering and seven Post-graduate programs in different specialized areas of Mechanical Engineering. The Department has well qualified and experienced faculty, and good laboratory facilities. The Department has liaison with reputed industries and R&D organizations like DRDO, NFTDC, Ashok Leyland, CMTI, BHEL (R&D), ARAI, Crompton & Greaves Ltd. Currently the Department is executing several consultancy and R&D projects. The Department also offers Ph.D programme in Mechanical Engineering and also has been recognized as QIP centre for M.Tech and Ph.D in Mechanical Engineering.



**A One Week GIAN Course**

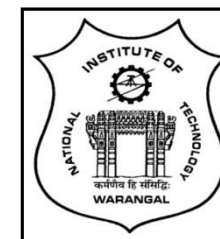
On

**3D Printing & Additive  
Manufacturing**

**June 20 – 24, 2016**

**International Faculty  
Prof. Ian Gibson  
Professor of Industrial Design  
Deakin University, Australia**

**Coordinator  
Dr. Y. Ravi Kumar**



Organized  
by

**DEPARTMENT OF MECHANICAL ENGINEERING  
NATIONAL INSTITUTE OF TECHNOLOGY  
WARANGAL – 506 004  
TELANGANA STATE – INDIA**