

Overview of the Course:

As competition grows from world-class manufacturers, engineering designers must critically examine their product design strategies. Competing in a global market requires the adaptation of modern technology to yield flexible, multifunctional products that are better, cheaper, and more intelligent than others. New product development procedures today use increasingly sophisticated solutions to streamline and speed product development as well as improve overall product quality. Traditional approach regarded users and consumers as passive consumers. Producers believed that if they develop a good quality product, that would satisfy their users, and they thought its functions are utilities.

The course will cover design thinking by hardware in the loop, Triz, axiomatic design. Case studies will cover interdisciplinary approaches to coursework, experiential learning, and projects. Issues on balancing fundamental theory and modeling methods with system level issues of hardware components, interfacing requirements, simulation and programming tools, and practical applications of Mechatronics systems, Robotics and Industry 4.0 will be discussed.

Course Contents:

Module A:

- *Introduction to Mechatronics Design Process*
- *Simulation and Modeling trends in Mechatronics*
- *Block diagram approach, Physical Modeling from actual system to physical model*

Module B:

- *Physics based models, Hardware in the loop design methodology*
- *Product Configuration and Product Design for Function*
- *Creative Problem Solving applied to Product Design*
- *Laboratory exercises with Mechatronics Technology Demonstrator*

Module C:

- *Design Thinking approaches, TRIZ, Axiomatic Design and Structured Innovation*
- *Design for Assembly, Design for Disassembly and Maintenance for Mechatronics Products*
- *Evaluation of Mechatronics Case Studies*

Module D:

- *Sensors, Actuators and Hardware Components*
- *Additive Manufacturing in Product Design*
- *Achieving Sustainability in Mechatronics Product Design*

Module E:

- *Digital Manufacturing and Product Prototyping*
- *Cyber physical Systems*
- *Industry 4.0*



Prof. Devdas Shetty is in the faculty of Mechanical Engineering and Dean of the School of Engineering and Applied Sciences at the University of the District of Columbia, DC, USA. His research interests include Mechatronics Systems Design, Product Design, Industry 4.0, Additive manufacturing and Micro Unmanned Vehicle Systems. Dr. Shetty has led several successful multi institutional engineering projects. In partnership with Albert Einstein College, he invented the mechatronics process for supporting patients with ambulatory systems for rehabilitation. In partnership with Armament Research, Development and Engineering Center (ARDEC), he led a multi-university industry team for the successful design and testing of a hybrid projectile. He established academic and research programs in Laser Manufacturing in collaboration with Connecticut Center for Advanced Technology (CCAT) under the National Aerospace Leadership Initiative (NALI).

Dr. Shetty is the author of **three Books and more than 200 scientific articles and six patents**. His books on

Mechatronics and Product Design are widely used as a textbooks in many universities around the world.



Who can participate?

This program is open to the Faculty, PG and Research students of Mechanical Engineering and allied Engineering streams 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 “**Mechatronic system and Product Design**” 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"> Without award of Grade With award of Grade 	Rs. 500/- Rs. 1,000/-
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 on additional payment of Rs.3,000/- on sharing basis.

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. 3,000/- in addition to the course fee.**

Account Name	GIAN NITW
Account No.	62447453600
Bank	State Bank of India
Branch	NIT Warangal
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 Coordinator:

Dr. V. VASU

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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 situated at a distance of 140 km from Hyderabad and well connected by rail and road. NIT, 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.



One Week

GIAN Course on

MECHATRONIC SYSTEMS AND PRODUCT DESIGN

December 16th - 20th, 2019

Call for Registration and Participation

International Faculty

Prof. Devdas Shetty

Dean and Professor
School of Engineering & Applied Sciences
University of District of Columbia
Washington DC, USA.

Course Coordinators

Dr. V. VASU

Dr. Y Ravi Kumar

Prof. CSP Rao

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