

Overview of the Course

The ultrasound (US) can play a key role in the production of active pharmaceutical ingredients (APIs). It also has wide applications in pharmacy such as in controlling particle size, controlled crystallization, production of nanomaterials, enhancing the solubility of poorly soluble drug candidates. Furthermore, the use of ultrasound during the tableting of pharmaceutical powders is a new emerging area. Ultrasound improves the characteristics of the compression process leading to the optimized mechanical strength of the compacts without applying excessive compression force. Therefore, problems associated with high-pressure compression in tableting can be overcome, and tablets may be manufactured more economically and consistently with the aid of ultrasound compared to conventional pressure processes. The countless achievements of API US-assisted production with outstanding effects such as narrower particle size distribution; decreased particle size, induction time, metastable zone and super-saturation levels; or a solubility increase. The process of drug (API) manufacturing can be broken down into a series of unit operations, such as sifting of ingredients, mixing and lubrication and encapsulation (filling) and polishing. Ultrasound plays a vital role in manufacturing nanomaterials and pharmaceuticals with both cost-effective manner and environment friendly.

This course will be highlighting both the fundamental and applied aspects of sonochemistry and synthesis routes for nanomaterials and pharmaceuticals with a specific focus on greener and cleaner processes.

The primary objectives of the course are as follows:

- i) Take the attention of participants and industrial persons towards ultrasonic processes as it is a green and clean route for the synthesis of value-added products.

- ii) Exposing participants to the fundamentals of acoustic and hydrodynamic cavitation and Sonoprocess engineering.
- iii) Overview of different paths for nanomaterial synthesis using ultrasound approach and its benefits over conventional synthesis routes
- iv) Overview and guideline for different pharmaceutical processes where ultrasound technology can be considered as a green and clean route of synthesis



Prof. Sivakumar Manickam

is a Chemical Engineer specializing Process Engineering of Nanomaterials, especially Nano-pharmaceuticals. He is working in the area of Ultrasound and Hydrodynamic Cavitation since 1997.

He has graduated from UDCT, Mumbai, India. Presently he is working with the University of Nottingham, Malaysia campus and his research group concentrates on the process development of cavitation based reactors towards technologically important nanomaterials. He is also heading the Manufacturing and Industrial Processes Research Division and is the Coordinator of the Centre for Nanotechnology and Advanced Materials (CENTAM). He was also the recipient of prestigious JSPS fellowship from the Government of Japan. He has published ~150 peer-reviewed journal and conference papers. He is the Fellow of Higher Education Academy (UK) and member of Institute of Nanotechnology (IoN).

For more details:

<https://scholar.google.co.in/citations?user=AwBg7oh1tkAJ&hl=en>

<https://www.nottingham.edu.my/Engineering/People/sivakumar.manickam>

Who can participate?

- This program is open to the Faculty, UG, PG students, and Research Scholars working or interested in pharmaceuticals reactors
- Engineers/Scientists working in Industries, Interested in process intensification of chemical processes.

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 registration form and complete web registration by online payment of Rs. 500/-. This provides the user with lifetime registration to enrol 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 Step 1. Click on Course Registration option at the top of the Registration form. Select the Course titled "Greener and cleaner ultrasonic process for nanomaterials and nano-pharmaceuticals" from the list and click on the save option. Confirm your registration by clicking on Confirm Course.

Registration Fee:

Faculty & Scientists	Rs. 2500/-
Participants from Industry / Consultancy firm	Rs. 5,000/-
Students & Research Scholars	
• Without award of Grade	Rs. 1,000/-
• With the award of Grade	Rs. 1,500/-
Students from abroad	\$ 300

Boarding & Lodging Fee:

Faculty, Participants from Industry /Research Organizations	Rs. 2500/- Accommodation -Visitors Block
Student & Research Scholar	Rs. 1,500/- Accommodation –Institute Hostel

Selection and Mode of Payment

Selected candidates will be intimated through e-mail. They have to remit the necessary course fee (**Mandatory for all**) and boarding & lodging fee (**if boarding & lodging is required**) to the Bank as per the details given below.

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	SBININBB

Candidates registering early will be given preference in the shortlisting process. For any queries regarding registration of the course, please contact the Coordinator:

Dr. Shirish Sonawane
Professor & Head
Chemical Engineering Dept.
National Institute of Technology, Warangal
Telangana state, India

Dr. Prakash Saudagar
Asst. Professor Biotechnology Dept.
National Institute of Technology, Warangal
Telangana state, India

About GIAN Course

MHRD, Govt. of India has launched an innovative program titled “Global Initiative of Academic Networks (GIAN)” in higher education, 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 PhD programmes in various specializations of 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 Chemical Engineering was established in the year 1964 and celebrated Golden Jubilee year in 2014. The Department offers B.Tech in Chemical Engineering, two M.Tech programmes (each in Chemical Engineering and Process Control) and PhD programs. Currently, the Department has 15 faculty members with different research expertise. The Department has good research facilities for both experimental as well as simulation based research.



A Five Day
GIAN Course on

Greener and cleaner ultrasonic process for nanomaterials and nano-pharmaceuticals

15 -20 December 2020

Call for Registration and Participation

International Faculty

Prof. Sivakumar Manickam

Chemical and Nanopharmaceutical Process Engineering; Associate Dean of Research and Knowledge Exchange.

University of Nottingham

National Coordinators

Prof. Shirish Sonawane

Dr. Prakash Saudagar

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