

Information Brochure
TEQIP-III Sponsored Short Term Course on
Advances and Applications of NanoFluids
(NanoFluids-2018)

Date: October 23–28, 2018

at
Department of Applied Mechanics
Motilal Nehru National Institute of Technology Allahabad
Allahabad- 211004, Uttar Pradesh (India)

Introduction:

Nanofluids are dilute liquid colloidal suspensions of nanoparticles with at least one of their principal dimensions smaller than 100 nm. Nanofluids possess enhanced thermophysical properties such as thermal conductivity, thermal diffusivity, viscosity and convective heat transfer coefficients compared to those of base fluids like oil or water and hence can be considered to be the next generation heat transfer fluids. Nanofluids are widely used in plethora of engineering applications like heat exchangers, power generations, solar water heaters, automobile transmission, nuclear reactors, tribology, heating and cooling systems, transportation, electronic cooling as well as biomedicine, food and detergency etc. Nanofluid as a smart fluid, where heat transfer can be reduced or enhanced at will, has also been reported.

Many critical phenomena involving nanofluids have not yet been investigated, and related underlying physical phenomena are yet to be fully understood. Further research are still carried out on the synthesis, characterization and applications of nanofluids so that they may be applied as predicted. Once the science and engineering of nanofluids are fully understood and their full potential researched, they can be reproduced on a large scale and used in many applications. Nevertheless, there have been many discoveries and improvements identified about the characteristics of nanofluids enabling to develop the engineering and medical systems that are more efficient and smaller, thus rendering the environment cleaner and healthier.

The importance of nanofluids is continuously growing with time. The purpose of present course is to introduce the participants synthesis, characterization, simulation and broad range of current and future applications that involve nanofluids, emphasizing their improved heat transfer properties that are controllable and the specific characteristics that these nanofluids possess that make them suitable for such applications.

Scope of the Course: Department of Applied Mechanics (AMD), MNNIT Allahabad organizes a short-term course on 'Advances in Applications NanoFluids' (NanoFluid-2018) to develop human resource in the area of Nanofluid research. The course offers basic understanding of synthesis, characterization, simulation and broad range of current and future applications that involve nanofluids through lectures and laboratory sessions.

Highlights of the Course:

- Delivered in most interactive and participative manner using the best pedagogical practices. Good for young teachers to improve their teaching skills, also.
- Methodical treatment connecting the synthesis, characterization, simulation of nanofluids and its present and future applications.
- Demonstration session on synthesis and characterization of nanomaterials/nanofluids.

- Exposure to CFD software solving various engineering problems involving nanofluids.
- Overview of present state-of-the-art of nanofluids and future scope of research and applications of nanofluids.

Takeaways/Outcomes: On completion of this course, the participants will be able

- To know the underlying principles of the synthesis and characterization of nanomaterials/nanofluids.
- To be able to use the CFD software for simulation involving nanofluids.
- To know the possible applications and research areas involving nanofluids.

Tentative Programme Schedule:

Date	Session-I (9 to 11 AM)	11 to 11:30 AM	Session-II (11:30 AM to 1:30 PM)	1:30 to 2:30 PM	Session-III (2:30 to 4.30 PM)	4:30 to 5 PM
Day-I		Tea Break		Lunch Break	Inauguration Ceremony. Fundamentals of Nanotechnology & Nanofluids	Evening Tea
Day-II	Synthesis and Characterization of Nanofluids		Nanofluid applications in Heat Transfer-I		Demonstration Session-I	
Day-III	Nanofluid applications in Heat Transfer-II		Computational Techniques in Nanofluids		Demonstration Session -II	
Day-IV	Nanofluid applications in Automotive Engineering		Nanofluid applications in Refrigeration & Air-conditioning		Demonstration Session -III	
Day-V	Nanofluid applications in Manufacturing Process		Nanofluid applications in Electronic Engineering		Demonstration Session -IV	
Day-VI	Nanofluid applications in Biomedical Engineering		Special applications of Nanofluids		Valedictory Function	

Venue: Seminar Room, Department of Applied Mechanics, MNNIT Allahabad.

Who should Attend this Course:

This course is ideal for practicing engineers, faculty and research students who have basic engineering/science background and wish to work in areas involving nanofluids.

Note: The number of participants is limited to thirty and will be selected on ‘first come first serve’ basis.

Registration Fees: For students and unemployed graduate engineers Rs. 1000/-, for persons from academia, research organization and practicing engineers Rs. 2000/-. Registration fee includes study material in a CD/DVD, refreshment/lunch during the days of course. The

registration fee does not include the accommodation and dinner charges. No T.A., D.A. will be paid to the participants for attending the course. Registration fee can be deposited to the following account through NEFT.

Account Name: Nanofluids-2018.

Account No.: 718400301000330.

Bank Name: Vijaya bank.

Branch: MNNIT Allahabad

IFSC Code: VIJB0007184.

Expected Resource Persons:

- Faculty members from IITs, NITs and premier institutes of India.

Frequently Asked Questions (FAQ):

- **Will I earn a certificate for this course?**

100% attendance is compulsory to earn a certificate. All the participants who attend the course in full will receive a 'Participation Certificate' signed by the Course Chair/Conveners.

- **What resources will I need for this course?**

Your curiosity! The rest will be provided by the organizers. However, you carry a laptop with you, it will be wonderful!

- **Do I need a scientific background?**

Any student or engineer who is having basic knowledge of engineering (material science, fluid mechanics, heat transfer) can participate in the course and learn a lot from it.

Organizing Committee:

Patron: Prof. Rajeev Tripathi, Director, MNNIT Allahabad.

Course Chair: Prof. S.J. Pawar, Head, Department of Applied Mechanics.

Course Conveners: Dr. Ajaya Bharti & Dr. Akshoy Ranjan Paul.

Contact Details:

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REGISTRATION FORM

Name: _____

Date of Birth (in dd/mm/yy format): _____

Designation: _____

Department: _____

Organization: _____

Highest Degree with Specialization/Branch: _____

Address for Correspondence: _____

Phone: _____ Mobile: _____ E-mail: _____

Registration Fee Details:

Amount: Rs. 1000 (for Students) / Rs. 2000 (from Academia/R&D/Industry)

UTR No. (in case of NEFT): _____

Date of Transaction: _____

Bank Details: _____

Signature of Applicant with Date: _____

*The completed registration form should reach to the course conveners **on or before 16 Oct. 2018** along with necessary registration fee. No application will be considered without the registration fee.

Refund Policy: If the applicant withdraws himself/herself from the course by **16 Oct. 2018**, full refund will be admissible. Beyond this deadline, no refund is possible.