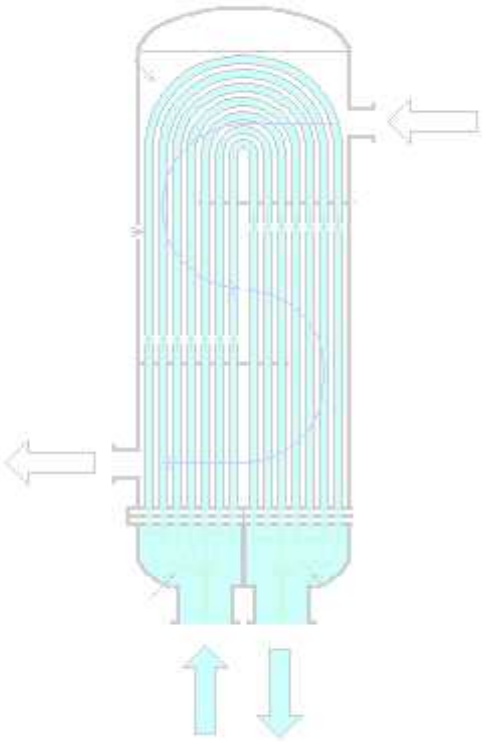
**A Summer Course on**

# Design and Optimization of Heat Transfer Device

**August, 3-6, 2015**



*Organized by:*

**DEPARTMENT OF CHEMICAL ENGINEERING**
**NATIONAL INSTITUTE OF TECHNOLOGY DURGAPUR**
Mahatma Gandhi Avenue, Durgapur–713209
www.nitdgp.ac.in

# Course Objectives:

Heat transfer principles have wide applications to many engineering systems. The transport mechanisms of heat, experienced by the researchers during the last decades, are intricate and interesting, particularly, in phase-changing materials, biological systems, cooling devices, etc. Design of heat transfer devices and its insulation is another major concern. The efforts are being made as well to achieve enhanced transport of heat. The devices for enhanced heat transfer use several complex geometries (the optimization of geometries is performed), electric field and magnetic field. The industries are gradually adapting the complex surface geometries for reducing the operating costs, though they initially restricted the use of relatively complex geometries. The energy-intensive manufacturing industries such as refineries, petrochemicals, power plants and automobiles essentially require optimal scale up of heat transfer devices in order to make *an efficient use of the thermal energy*. Motivated by these aspects and challenges, this summer course sets the following three course objectives**:**

**Topics:**

1. Mechanisms of heat transfer
2. Design and construction of heat transfer devices
3. Optimization and Dynamic responses of the heat transfer devices

**Part 1** will cover the transport mechanisms of conduction, convection and radiation with and without phase change and will also cover heat transfer using extended surface.

Part 2 will cover the design methods of several heat exchangers including shell & tube, double pipe, compact heat exchangers, etc.

Part 3 will consider the design validation through optimization and dynamic responses of the heat transfer devices.

# Audiences:

This course has been designed for Faculty Members, Researchers and Engineers from the discipline of Chemical Engineering, Mechanical Engineering, Civil Engineering, Production and Bio-Engineering. The preceding program is aimed to bring the young researchers, faculty members and industry personals from various Academy, R&D institutes and Energy sectors under the same umbrella to share their experiences, knowledge and in-depth understanding of the basics for implementing and/or using the various advanced techniques in heat transfer fields for a successful journey towards better tomorrow. This summer course will be useful and have an immense value to the participants in their teaching and research skills and development of the next generation technologies for its successful implementation.

# Resource Persons:

**Mechanisms of heat transfer** (Day 1)**:**

| | |
|---|---|
| **Dr. Tamal Mandal**, Professor and Head, Chemical Engineering Dept., NIT Durgapur | Principle of conduction and heat transfer in extended surfaces |
| **Dr. Radha Das**, Professor, Haldia Institute of Technology, Haldia & Council Member – IIChE. | Convective heat transfer |
| **Dr. Jayanta Chakraborty**, Assistant Professor, IIT Kharagpur | Nanofluids |
| **Abhiram Hens**, Scientist, CSIR - Central Mechanical Engineering Research Institute, Durgapur | Heat transfer during phase change |

**Design and Construction of heat transfer devices** (Day 2 & 3)**:**

| | |
|---|---|
| **Dr. Binay K. Dutta**, Professor & Formerly Chairman, WBPCB, Govt. of West Bengal. | Heat Exchangers including shell & tube, double pipe, compact heat exchangers, etc. |

**Optimization and Dynamic responses of the heat transfer devices** (Day 3 & 4)**:**

| | |
|---|---|
| **Swapan Paruya,** NIT Durgapur | Heat transfer rating problems through dynamic optimizations |

# Registrations:

The audiences from the academics, industries and research laboratories may register for attending the course. The registration fees are:

Academics (Full): Rs. 5000/-
Students / Scholars: Rs. 3000/-
Industries and Research laboratories: Rs. 10000/-

The registration fees through Demand draft / Multicity cheque / Bank Transfer may be sent in favour of Summer Course-DOHTD, NITD payable at State Bank of India, NIT Durgapur (IFSC – SBIN0002108). The fee is charged for the course materials, working tea and lunch.

**Last date of receiving completed registration form is July 20, 2015.** *The last page contains the registration form.*

# Accommodation:

Accommodation for the outstation participants attending the summer course can be arranged on payment basis. They are requested to communicate well in advance to avoid the inconvenience. No TA / DA will be paid to the participants.

# NIT Durgapur:

National Institute of Technology, Durgapur (formerly Regional Engineering College, Durgapur), was established by an Act of Parliament in 1960 with an aim to function as a pace setter for engineering education in the country and to foster national integration. It is a fully-funded premier institution of the Government of India and is autonomously administered by Board of Governors. The Institute awards B.Tech., M.C.A., M.Sc., M.B.A., M.Tech. and Ph.D. degrees to students in various disciples. In addition to the normal intake, a few seats are reserved for Foreign Students who are nominated by the Ministry of External Affairs, Government of India, and the Indian Council for Cultural Relations, Government of India. For more information, visit http://www.nitdgp.ac.in

# Chemical Engineering Dept.:

The Department of Chemical Engineering of National Institute of Technology, Durgapur, was established in 1964 with an active support of UNESCO. The department was built up by a team of dedicated faculty members with the help of a host of visiting professors deputed by UNESCO to NIT Durgapur. The department conducts B. Tech. program, M. Tech program and Doctoral program in Chemical Engineering. The curriculum and syllabi of the courses offered are continuously updated over the years to keep pace with rapidly changing technological developments. For more information, visit http://www.nitdgp.ac.in/che

# How to reach NIT-Durgapur:

The Institute is located about 160 KMs north-west of Kolkata on the Howrah-Delhi Main Railway-Route and overlooking the National Highway No. 2 (the great Grand- Trunk Road) and 8 KMs from Durgapur Railway station via City centre near Gandhimore. For more information, you may please visit our institute website: http://www.nitdgp.ac.in/about_us.php

# Correspondence:

Swapan Paruya
Dept. of Chemical Engineering
NIT Durgapur
M. G. Avenue, Durgapur -713 209
Email : swapanparuya@rediffmail.com
Land line: 0343-2754086
Mobile : 9474404033

Dr. Bimal Das
Dept. of Chemical Engineering
NIT Durgapur
M. G. Avenue, Durgapur -713 209
Email : bimal_30@yahoo.com
Mobile : 9434789023

# Registration Form

**A Summer Course on Design and Optimization of Heat Transfer Device**
Chemical Engineering Dept., NIT Durgapur, West Bengal - 713209

**August, 3-6, 2015**

Name of the Participant (in block letters):……...

Address: …….

……

Phone: ……..…

E-mail: ……

Academic Qualification: …….

Affiliation: ……..

Present Position: ……

Payment Details**:**

Bank Name: ……

Amount: ……..

DD / Cheque No / Bank transfer transaction ID: ……

Date:

……..

Date: Signature of the participant

Signature and Seal of Forwarding / Recommending Authority