

Course Objectives:

The aim of this course is to introduce different types of heterogeneous catalysts, their structures, synthesis processes, characterisation and solid state chemistry associated with these catalysts. Mechanism and kinetics of heterogeneous catalytic reactions and reactor design, along with deactivation of the catalysts, will be discussed in depth in this course so as to provide a holistic view of applied heterogeneous catalysis to the participants.

Faculty:

IIT KGP faculty will deliver the lectures.

Eligibility:

A degree in Chemical Engineering

Category A:

- I. Teachers of TEQIP approved degree level engineering colleges

Category B:

- II. Teachers of Non-TEQIP degree level engineering colleges
- III. Engineers/Researchers from Govt. Labs/Industry
- IV. Research Scholars (PhD students) from IIT Kharagpur/ Other Institution
- V. IIT non-faculty

Course Contents:

- I. Introduction to heterogeneous catalysts: Bulk catalysts, supported catalysts, mixed agglomerate catalysts, phase transfer catalysts, catalyst synthesis processes.

- II. Catalyst characterization: Fundamentals of solid state chemistry, structure of solids, structure-property relationship and analysis: BET surface area and pore volume analysis, X-ray diffraction, scanning electron microscopy, infrared spectroscopy.
- III. Kinetics and mechanism of the heterogeneous reactions: Mechanisms of solid catalyzed reactions, assessment of solid catalyzed reactions, development of reaction mechanism.
- IV. Analysis of reaction data: Chromatographic techniques (gas chromatography and liquid chromatography), demonstration of chromatography in GC and HPLC. Mass transfer effects in heterogeneous catalysis, internal and external mass transfer limitations.
- V. Reactor design, catalyst applications and deactivation kinetics: Applications of heterogeneous catalysts in different fields, deactivation kinetics of solid catalysts, reactor design.



A TEQIP Short Term Course on

“Heterogeneous Catalysis for Chemical Engineers”

December 10-14, 2018

Last date of application November 15, 2018

*A Continuing Education Programme of
Indian Institute of Technology
Kharagpur*



Organized by
Department of Chemical Engineering
Indian Institute of Technology
Kharagpur-721302, India.

General Information:

Kharagpur is situated at a distance of 130 km from Kolkata and is unique with its green, calm and quiet campus. Historically, IIT Kharagpur started its journey in the “Hijli detention camp” which presently houses a science and technological museum known as the Nehru Museum of Science and Technology.

Connectivity:

Kharagpur is an important junction and is well-connected to all parts of the country by rail service (SER). Numerous local and express trains are available from Howrah. The institute is approximately 7 km from Kharagpur railway station. Auto-rickshaws (Rs. 100) and taxis (Rs. 150) are available from the railway station for reaching IIT Campus.

Course Coordinators:

Prof. S. Sengupta

Prof. P. A. Deshpande

Department of Chemical Engineering,
IIT Kharagpur, Kharagpur-721302,
West Bengal.

Email: sonalis@che.iitkgp.ac.in

parag@che.iitkgp.ac.in

Phone: +91-3222-283954/16

FAX : +91-3222-255303



Accommodation and Food:

Limited shared accommodation is available in institute guest houses for TEQIP affiliated faculty members without payment. Shared accommodation for other participants is available on a payment basis (Rs. 1000/- per day in TGH A/C single room or Rs. 1500/- for double occupancy). On prior intimation, we will try to arrange accommodation with the above charges. *Course fee includes food and snacks.*

Course Fee:

Category A

TEQIP faculty	NO FEE*
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* TEQIP Faculties should send a **DD of Rs: 2000** only in the name of “**CEP-ISWT**” payable at “**Kharagpur**” during their application, without which the application will not be entertained. The DD will be sent to the address:

Prof. Sonali Sengupta

Department of Chemical Engineering, IIT Kharagpur, Kharagpur -721302, West Bengal (by 15th November, 2018)

(DD will be refunded at the time of certificate distribution.)

Category B

Non- TEQIP faculty	INR 5900
Outsider student	INR 3540
IIT-KGP student	INR 3540
IIT-KGP non-faculty	INR 5900
Industry	INR 35400

For category A, course material, accommodation and food will be provided with no fee. For Category B, course fee includes course material and food. The fee is inclusive of GST.

How to Apply:

Procedure for applying in IIT Kharagpur online Course Registration portal

Use the link: <https://erp.iitkgp.ernet.in/CEP/courses.htm>

Step to be followed:

1. Sign-Up
2. Verify your email-id (link will be send to your e-mail)
3. Login
4. Edit Profile(Fill up all the mandatory fields, upload photo and signature)
5. Click on 'APPLY NOW' button.
6. Upload your pdf format id-card. (**TEQIP faculties should upload their affiliation (college) ID card in the site**)

An e-mail will be communicated from the Continuing Education Program, IIT Kharagpur to the shortlisted applicants stating the payment details.

*** This is one time sign up process in apply to IIT Kharagpur online Course Registration portal.*

You can apply to other courses using the same credential.