



Indian Institute of Technology Kharagpur (WB) 721 302

**Cryogenic Engineering Centre
Announces Training Programme on**

Basic Cryogenics*

*(*20 TEQIP-II engineering college teachers can attend this course without any course fee.)*

February 20 - 24, 2017 (Monday to Friday)

Cryogenic Engineering Centre of IIT Kharagpur is an academic establishment in India that offers M Tech and Ph. D. Degrees in Cryogenic Engineering. Over more than three decades, the faculty of this Centre have gained experience in teaching and research in different aspects of cryogenics like superconducting magnets, material properties at low temperature, simulation of cryogenic process plants, cryogenic equipment like turbo-expander and heat exchanger, technology for natural gases, cryogenic air separation, low temperature processes and phenomena and safe handling of oxygen gas etc. The Centre regularly provides training to industry and academia of India and abroad and takes up sponsored research and consultancy projects. More than 100 short courses and training programmes have been conducted from this Centre in the field of Cryogenics and allied technologies.

Course Outline:

Introduction; History and applications; Basic thermodynamics and heat transfer; Properties of cryogenic fluids: unique properties of cryofluids, properties of quantum fluids of LH_2 and LHe ; Use of REFPROPS software. Materials properties at low temperature: mechanical, thermal and electrical properties including the phenomenon of superconductivity; Cryogenic liquefiers: Linde, Claude and the derivatives, cryogenic refrigerators: Reverse Stirling, pulse tube and G-M. Cryogenic separation processes; Cryogenic Air Separation plants, Cryogenic storage and transfer devices; cryogenic safety; Thermal insulations; Measurement techniques: pressure, temperature and level sensors; Vacuum techniques: rotary and diffusion pumps; Compressors: reciprocating, screw and centrifugal. Heat exchangers: conventional and cryogenic. Turbo-expanders. Visit to Cryogenic Engineering Centre. **Faculty:** Dr. Parthasarathi Ghosh (Coordinator) and Prof. Kanchan Chowdhury, Cryogenic Engineering Centre

Eligibility:

Engineers and scientists with degrees in any branch of science and engineering are eligible. Candidates without the background of science and engineering can apply only if they are professionally engaged in the relevant field.

Venue of Lectures:

Visveswaraya Guest House Lecture Room, Indian Institute of Technology, Kharagpur 721302

Timing : Classes will begin at 9 AM sharp. There will be breaks for lunch and coffee. Classes will end at 6 PM everyday.

Registration:

Registration fee: **INR 24,000 (US\$ 400)**. 20 TEQIP-II College teachers, who would be selected based on their CV) are exempt from paying the course fee. Bank transfer is the only mode of payment for all participants. A scanned copy of the bank transfer document may be sent as proof of payment which is required for registration. Foreign companies will pay only in US Dollars mentioned above. Bank details: (a) Name of Bank : Syndicate Bank, (b) Address of Bank: IIT-SRIC Extension, Kharagpur 721302, India; (c)Account Name: CEP-STC, IIT Kharagpur; (c) Address of Beneficiary: Indian Institute of Technology, Kharagpur, PIN: 721 302, West Bengal, India; (d) Account Number: 9556 220 000 2955; (e) IFSC/RTGS Code : SYNB0009556 (f) Bank Swift Code: SYNBINBB120. All Bank charges are to be borne by the company. Charges for the boarding and lodging should be paid by the participants directly to Guest House. Course fee includes bound lecture notes and tea/coffee provided during the course.

Accommodation:

Accommodation has been booked for all the participants in advance at New Technology Guest House and Visveswaraya Guest House. Due to limited number of rooms made available for this course, participants may have to share rooms. 4 AC suits & 8 Double bedded rooms at NTGH and 4 Double bedded AC rooms & 1 Double bedded Non-AC room at VGH are all that we have for this course. Tariff is given at IIT Kharagpur website at <http://www.tgh.iitkgp.ac.in>.

General Information:

IIT is located about 6 km from the Kharagpur Railway Station. Kharagpur, 116 km from Kolkata by train, the capital city of the State of West Bengal in India, is conveniently connected to Howrah (Kolkata) by many local trains every hour and also by express trains. Kharagpur has direct rail links to most major cities in India. Those travelling by air may hire a taxi from Calcutta airport, which would bring you to IIT Campus at Kharagpur (150 km one way) within 2.5 hours. The minimum charge is about INR 3,000. Autorickshaws (INR 120) and Taxis (INR 160) are available to come from the Kharagpur Railway Station to IIT campus. Weather at Kharagpur would be pleasant requiring no winter-garment in February-March. Please contact Mr. Arjun Kumar Saha of J K Travels (+91 94341 93014, +91 99325 73310) or Damodar Maity of Saraj Travels (+91 94341 46359, +91 3222 277015) for travel-related help. You may request any one of them to send a vehicle to Kolkata airport to pick you up. Please mention Prof. Kanchan Chowdhury's course or Dr. Parthasarathi Ghosh's course for reference of the travel agent.

Sponsors may please note:

- Please inform the candidate that he/she should bring a scientific calculator to the classroom.
- Please give a photocopy of this brochure to the prospective participant as soon as he/she is nominated by the company and please tell them to contact the coordinator directly via e-mail.

Information Required for Registration for all participants:

Name, Designation/Responsibility, Name and Address of Company, Phone (Off), Phone (Res), Phone (Mobile), E-mail, Date of Birth, Highest Academic Qualification, Nationality, Proof of Bank transfer details and Amount, Requirement for Guest House room and type.

Only TEQIP-II College teachers should submit detailed CV for facilitating the process of selection.

Additional Information Required for Registration of Participants holding Foreign Passports:

Name, Fathers name, Nationality, Date of Birth, Place of birth, Number, Date and Place of Issue of Passport, Current Residential Address, Permanent Residential Address, Profession, Place of Employment, Academic Credentials. Please use separate pages for each participant.

Please E-mail all information to:

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Other courses offered by Cryogenic Engineering Centre during this time:

Sl. No.	Name of Course	From	To	Duration	Registration Fee
1.	<i>Cryogenic Air Separation & Oxygen Safety</i>	February 27, 2017 Monday	March 04, 2017 Saturday	6 days	INR 54,000 (US\$ 900)
2.	<i>Liquefied Natural Gas: Transportation & Regasification</i>	March 06, 2017 Monday	March 08, 2017 Wednesday	3 days	INR 18,000 (US\$ 300)
3.	<i>Hospital Fires: Root causes and their Prevention</i>	March 10, 2017 Friday	March 11, 2017 Saturday	2 days	INR 12,000 (US\$ 200)

LAST DATE OF APPLICATION for ALL: January 31, 2017