

## INTRODUCTION

IIT Kharagpur is the first of its kind in the country and has been providing trained manpower for different Industries/Research organizations through B.Tech, M.Tech and Ph.D programs. Specialized courses and workshops are also being organized under Continuing Education Programme (CEP) to train personnel from Industries/Universities. The institute has established a sophisticated **Vacuum Teaching Laboratory** in Cryogenic Engineering Centre under Indo-German Collaboration Programme, to train technicians, engineers, scientists and teachers working in the field of vacuum and its related areas. This laboratory houses several advanced vacuum equipment for production/measurement of vacuum and troubleshooting/application of vacuum systems. In addition, the institute has several high vacuum systems applied for metallurgical processes, MBE growth of thin films, microelectronic devices, Surface studies and Chemical analysis. Expertise/Facilities also exist on application of vacuum in chemical Engineering, food/pharmaceutical technology and biotechnology. These facilities are routinely used to solve technical problems faced by vacuum and related industries.

## OBJECTIVES

Vacuum Technology has diversified applications in different areas of science and Engineering. These include the major fields like Electronics, Metallurgical/ Chemical Processing, Food Processing, Space-Simulation, Nuclear Engineering, Electrical Engineering and Cryogenic systems. This has resulted in rapid development of many sophisticated vacuum instruments, pushing the range of vacuum to  $10^{-12}$  Torr. To keep pace with this advancement in vacuum technology, it is absolutely necessary for the engineers/scientists/teachers of our country to get a first hand exposure to these modern vacuum equipment and their applications. Keeping this objective in mind, present course on **Vacuum Technology and Process Applications** is undertaken. The uniqueness of this course is that, in addition to classroom lectures, emphasis is given to the *practical training* in designing, handling and trouble shooting of variety of modern vacuum pumps, components, measuring systems, residual gas analyzers, leak detectors, vacuum furnaces, coating units, vacuum dryers and other applications.

## COURSE OUTLINE

1. Introduction to basic concepts of vacuum.
2. Physical and chemical phenomena under vacuum.
3. Application of vacuum in different industries
4. Selection criteria of vacuum pumps
5. Pump-down calculation in vacuum systems
6. Leak-detection and trouble shooting of vacuum systems

## FACULTY



Prof. V. Vasudeva Rao is a Professor of Cryogenic Engineering, Indian Institute of Technology, Kharagpur. He has 33 years teaching and research experience in the area of Vacuum Technology, Superconductivity and its applications. He is Member of many professional societies like Indian Vacuum Society, ICC & IEEE. He has handled many Sponsored Research and industrial consultancy projects and published over 70 journal papers in international journals. He has established Vacuum Technology Laboratory at IIT Kharagpur under Indo-German collaboration programme. He has co-authored a text book on "Vacuum Science and Technology" (Allied Publishers- New Delhi). He is a consultant to Power Grid Corporation of India Limited, BHEL, Crompton Greaves, DRDL, and Schneider).

## IIT KGP Presents

AN OFF-CAMPUS ONE DAY COURSE ON

### VACUUM TECHNOLOGY AND PROCESS APPLICATIONS

(05<sup>th</sup> July 2018)

at

ATLAS COPCO (INDIA) LIMITED,  
JAIPUR



VACUUM TECHNOLOGY LABORATORY  
CRYOGENIC ENGINEERING CENTRE  
INDIAN INSTITUTE OF TECHNOLOGY  
KHARAGPUR - 721 302.

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