

**A Refresher Course**  
**on**  
**Essential fundamentals of Unit Operations in chemical Engineering:**  
**theory and practice for Plant personnel**

**8<sup>th</sup> & 9<sup>th</sup> September 2017**

Department of Chemical Engineering  
G H Patel College of Engineering & Technology,  
Vallabh Vidyanagar -388 120, Gujarat,  
(A Charutar Vidya Mandal Institute)

### **Preamble**

Training is an organized activity for increasing the technical skills of the employees to enable them to do particular jobs efficiently. In other words, training provides the workers with facility to gain technical knowledge and to learn new skills to do specific jobs. Training is equally important for the existing as well as the new employees. It enables the new employees to get acquainted with their jobs and also increase the job-related knowledge and skills. Among the most useful skills that can be addressed are manager communication, employee motivation, and employee recognition. Due to globalization a large number of projects are coming up and there is an acute shortage of trained manpower. The personnel already available, if trained further for the job, can help the situation to a great extent.

The proposed refresher course/module training offers an introduction to some of the main subject areas involved in chemical engineering disciplines, and will broaden the technology base of participants with a view to promote improved communication with chemical engineers. This intense training is aimed at engineers, scientists, operators, chemists working in the chemical and process industries, at government agencies who work in close collaboration with chemical engineers and companies who employ chemical and process engineers. It offers an introduction to some of the main subject areas involved in chemical engineering disciplines, and will broaden the technology base of participants with a view to promote improved communication with chemical engineers.

### **About the course**

- Overviews the difference between laboratory and industrial scale practice of chemistry, consequences of mistakes, and approaches needed to scale a lab reaction process to an operating scale

- Covers basics of chemical reaction engineering, mass, energy, and fluid energy balances, how economics are scaled, and the nature of various types of flow sheets and how they are developed vs. time of a project
- Details the basics of fluid flow and transport, how fluid flow is characterized and explains the difference between positive displacement and centrifugal pumps along with their limitations and safety aspects of these differences
- Reviews the importance and approaches to controlling chemical processes and the safety aspects of controlling chemical processes,
- Reviews/reviewing the important chemical engineering design aspects of unit operations including distillation, absorption and stripping, adsorption, cooling towers, drying etc.

### **Objectives and benefits**

- Refreshing and updating of the fundamental understanding of chemical engineering principles.
- To outline the overview the concepts of chemical engineering so that non-chemical engineers can interface with and understand basic chemical engineering concepts
- To impart skills among the workers/technicians/chemists (plant personals/employees) systematically so that they may learn quickly.
- To improve the productivity of the workers/employees and the organization.
- To prepare workers/ employees for promotion to higher jobs by imparting them advanced skills.

### **Learning outcomes**

The course will help you to take on a professional role that involves aspects of chemical engineering and enable you to communicate and collaborate more effectively with chemical and process engineers.

It will help you to understand:

- The factors that distinguish chemical engineers from other engineers.
- Discuss the basic concepts of chemical engineering including mass and energy balances and the concept of unit operations.
- Describe basic safety regulations and procedures and the basics of kinetics and reactive chemical analysis.
- Explain the basics of fluid flow and pumps, the use of cooling towers, and the basics of tank and vessel design parameters.
- Explain the basics of distillation, absorption, stripping, chromatography and drying processes and equipment choices for these unit operations.
- Calculate basic stoichiometry and unit conversions.
- Describe the basics of solids handling, characterization, transfer and storage.

## **Who should attend?**

Plant Operators, Engineering managers without a chemical engineering background, chemists, non-chemical engineers, patent attorneys, legal and government personnel who interface with chemical engineers and the chemical industry. Participants from any size company or industry in the chemical, petrochemical, and materials processing industries.

## **Resource persons & medium of Instruction**

Resource persons for the above course will comprise of the experienced Chemical Engineering faculty members and persons from industries. Medium of instruction will be Hindi/ Gujarati and Power point slides with simple English

## **Registration Fees: Rs. 2000/ per person**

This includes refreshment (breakfast, lunch and tea), course materials for both the days. All payments should be made through DD/Cheque drawn in favour of Principal, G H Patel College of Engineering & Technology,, payable at Vallabh Vidyanagar.

## **About us**

### ***Vallabh Vidyanagar***

Vallabh Vidyanagar, named after Sardar Vallabhbhai Patel, The Iron Man of India, is 6 kilometers from Anand, The Milk Capital of India. Over the years it has emerged to be an active Educational Hub in the western part of India. It has made its distinct identity in the sector of education by offering numerous emerging and innovative educational programmes and by attracting students from across the globe. Anand is situated between Ahmedabad and Vadodara on the main rail-link and also NH -8, about 75 kilometers from Ahmedabad and 40 kilometer from Baroda. Vallabh Vidyanagar is blessed with the beauty of nature. Its lush green trees of different types and kinds have not only made the town environment-friendly, but also created a serene and ever-enjoyable peaceful atmosphere generating synergistic pleasure on the campus

### ***The Institute & The Management***

The Institute, G H Patel College of Engineering & Technology (GCET) is managed by the highly reputed and the largest educational trust of Gujarat, Charutar Vidya Mandal (CVM), established in 1945 for the upliftment of rural education. Over the span of 60 years CVM has been making spectacular progress by venturing into various emerging

disciplines. Today CVM is nurturing 49 educational institutions of diverse types contributing to the panoramic growth of Vallabh Vidyanagar and New Vallabh Vidyanagar. From the very inception (in the year 1996) GCET has striven to develop itself into an 'Institution of Excellence' in education and research in consonance with the spirit of modern Gujarat. In meeting this challenge for excellence, GCET has shaped its institution to the contemporary as well as future demands of need-oriented education. Today GCET has a total strength of 2000 students studying for Chemical, Mechanical, Information Technology, Electronics & Communication, Computer, Electrical Engineering, Mechatronics and civil engineering under the tutelage of 125 dedicated and competent faculty members. We also have seven post graduate programmes including the one in Chemical Engineering. Our college was ranked 28th among top 100 engineering college across country in 2015-16 (Data Quest May 2016) and honored by ABP News National Education Awards 2015 and 2016 with "outstanding engineering institute west" for second consecutive year

### ***Department of Chemical Engineering***

Department of Chemical engineering of G H Patel College of Engineering & Technology (GCET) was established, in 1996 as one of the first undergraduate self financed (unaided) engineering disciplines along with Information technology in the state of Gujarat. Originally affiliated to Sardar Patel University, GCET is now one of the affiliated colleges under Gujarat Technological University The department, having an intake of 60 students, has so far produced more than 1000 chemical engineering graduates. The Department currently has thirteen faculty members who bring to the Department a wealth of expertise to maintain a vibrant teaching and research environment. It has thirteen laboratories with total of more than 135 equipment, pilot plants and bench-scale experimental set ups to cater the need of undergraduate curriculum of B.E (Chemical Engineering) of Gujarat Technological University. Today many of our distinguished alumni are holding respectable positions in industries like Reliance Petrochemicals, Essar oils, Tata Chemicals, L & T, TCS, Infosys, GSFC, Atul limited and many more. Faculty members have a good frequency of publication peer reviewed National and International journals like Hydrometallurgy (Elsevier), Environmental Science and Pollution Research (Springer), International Journal of Hydrogen Energy (Elsevier), Journal of Polymer Science (Taylor & Francis), Journal of Surface Science & Technology, Journal of Scientific & Industrial Research and many others.

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## **REGISTRATION FORM**

**A Refresher Course**

**on**

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Full Name:

M/F:

Designation:

Organization:

Mailing Address:

Accommodation Required: Yes/No

Contact No

E-mail:

Details of Registration Fees:

DD No. \_\_\_\_\_ Date: \_\_\_\_\_ Amount: \_\_\_\_\_ Bank:

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(DD in favor of Principal, GCET, Vallabh Vidyanagar, payable at Vallabh  
Vidyanagar)

Signature of Applicant

Sponsoring Authority

Designation

Office seal