PE078: Hydrotreating & Hydrocracking Process Technology
Training Description:

This five-day intensive training overlays the process fundamentals and sound knowledge of Hydro-treating and Hydro-cracking processes where Hydrogen is a key material in the upgrading and treatment of refinery products and fractions. A review of the state-of-the-art in process design, energy and mass integration will be presented as potential key improvements.

In-depth practical review of Hydro-treating/cracking technologies is provided across the course topics. The contents focus on the Hydro-conversion of heavy products, distillates, diesel, and naphtha into other hydrogenated/lower molecular weight products, besides saturated products with enhanced Cetane number, free of sulphur, nitrogen and metals. The course also discusses some process design/chemistry and engineering principles for such processes and presents scope for improvements.

This course is valuable to engineers/scientists, designers and researchers involved in the industry of Hydro-conversion in refiners. Yet it is most beneficial to those professionals with experiences in other fields and willing to acquire knowledge in Hydro-conversion processes.

This training will strongly discuss:
- Lectures, exercises and team work in some areas of process design and improvement
- Real studies that exhibit improvement solution for energy/environment
- Knowledge transfer of instructor’s extensive engaged industrial consultations
- Practice of Excel-based design tools for mass/energy integration in refining plants
- Open discussion on actual problems/data for design and improvements

Training Objective:

By the end of the training, participants will be able to:
- Develop deep understanding of mass/H2/energy balance in refining processes
- Gain in-depth knowledge of the state-of-the-art of material and energy integration
- Evaluate different flow schemes for hydro-treating and hydro-cracking processes
- Manipulated process design and operation variables for better H2-conversion performances
- Master experiences of chemistry/kinetics, function of catalysts, clean production, environmental issues of very typical upgraded fuel productions

Training Designed for:

This course is intended for all Process/Operational Engineers, Technicians, Control Engineers, Designers, Scientists and Researchers working closely in the refining industry in general or particularly Hydro-cracking, Hydro-treating processes. It is also substantially beneficial to other professionals and experts who have considerable experiences in other fields of business and keen to gain a sufficient knowledge in the particular industry of Hydro-conversion.

All levels of professionalism are eligible for the course, ranging from young-fresh personnel to highly experienced ones as well as Process and Development Engineers, Plant Managers, Operational Engineers/Control Personnel, Researchers/Scientists and Project and Design Engineers.
Training Program:

**DAY ONE:**
- **PRE-TEST**
- **INTRODUCTION: THE BASICS**
  - Fundamentals of Mass/Hydrogen and Energy Balance in Refineries
  - State-of-the-Art of Material and Energy Integration
  - Fundamentals of Petroleum Refinery Processing: Downstream Crude Oil Refining
  - Products’ Specifications and Characteristics
  - Process Design/Optimisation and Heat Integration Schemes
  - Environmental and Economic Issues

**DAY TWO:**
- **HYDRO-TREATING – FUNDAMENTALS AND PRINCIPLES**
  - Introduction to Hydro-Conversion Processes and H2 Sources
  - Process Flow Schemes
  - Process Chemistry and Kinetics
  - Catalysts/ Heat of Reactions
  - Operating Conditions, Principles and Design Considerations
  - Hydrogen Requirements for Hydro-treating

**DAY THREE:**
- **HYDRO-TREATING – ADVANCED PROCESSING**
  - Reactors Design
  - Applications to Naphtha, Middle Distillate, Gas Oil and
  - Atmospheric Residue Desulphurisation
  - Saturation of Benzene in Gasoline
  - Potential Improvements for Material and Energy Savings
  - Clean Diesel Hydro-treating Process Technology – Critical Issues

**DAY FOUR:**
- **HYDRO-CRACKING – FUNDAMENTALS AND PRINCIPLES**
  - Feed Stocks and Products
  - Process Chemistry/Kinetics
  - Catalysts/De-activation and Re-Generation
  - Products Quality and Yields: Process Configuration, Catalyst Type and Operating Process
  - Variables and Parameters
  - Reactors Technology for Hydro-cracking
  - Single Stage Hydro-cracking Process Technology

**DAY FIVE:**
- **HYDRO-CRACKING – ADVANCED PROCESSING**
  - Two Stage Hydro-cracking Process Technology
  - Process Design Features
  - Hydrogen Balance and Consumption
Training Requirement:

“Hand’s on practical sessions, equipment and software will be applied during the course if required and as per the client’s request”.

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 30% Workshops & Work Presentations, Techniques
- 20% Based on Case Studies & Practical Exercises
- 20% Videos, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

As per the course location - This rate includes participant’s manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:
07:45 - 08:00  Morning Coffee / Tea
08:00 - 10:00  First Session
10:00 - 10:20  Recess (Coffee/Tea/Snacks)
10:20 - 12:20  Second Session
12:20 - 13:30  Recess (Prayer Break & Lunch)
13:30 - 15:00  Last Session

For training registrations or in-house enquiries, please contact:
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Training & Career Development Department