

COURSE OVERVIEW PE0630
Urea Manufacturing Process Technology

Course Title

Urea Manufacturing Process Technology

Course Date/Venue

Session 1: April 20-24, 2025/Al Khobar Meeting Room, Hilton Garden Inn, Al Khobar, KSA

Session 2: August 24-28, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE



Course Reference

PE0630



Course Duration/Credits

Five days/3.0 CEUs/30 PDHs

Course Description



This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.



Today, urea is one of the most common nitrogen fertilizer. Urea manufacture is associated with anhydrous ammonia production in modern plants because carbon dioxide is a by-product of ammonia production and is thus readily available to react with the ammonia. The urea can either be dried and granulated into 46% N urea fertilizer, or dissolved in water with ammonium nitrate to make urea ammonium nitrate (UAN) solution.



In most of the modern fertilizer manufacturing plants, most of the ammonia is used on site in the production of urea. The urea is used as a nitrogen-rich fertilizer, and as such is of great importance in agriculture and is also used as a component in the manufacture of resins for timber processing and in yeast manufacture.

This course is designed to provide engineers in the fertilizer industry with an in-depth view of the urea production technologies.

The course will guide engineers to identify future trends and needs of this fast pace industry. The course will examine the status and the most recent urea production technologies. Looking further ahead, the course will review some potentially significant developments and concepts that may impact the manner in which urea is produced. Some of these manufacturing routes are being tested or employed at few plants around the world, but have yet to be fully developed into commercial processes.

The course will also provide an opportunity to exchange ideas and disseminate information through discussion of the various technical, economic, safety, and environmental issues. The knowledge gained will enable the participants to solve specific problems at his/her plant as well as improve its operation and enhance its profitability.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain an in-depth knowledge on urea manufacturing and update their knowledge with the latest trends in this fast pace technology
- Recognize the global overview and outlook of the nitrogen fertilizer industry including its materials product types, characteristics and properties
- Discuss the economics of the urea industry and employ ammonia production processes such as reforming, oxidation, removal of carbon monoxide and water and synthesis of ammonia
- Implement the latest strategies on urea production processes such as the urea plant installation, description of production, process water sources and quantities as well as the storage and transfer equipment
- Explain the environmental impact of the urea production such as emissions and waste, environmental hazards associated with emissions and quality standards
- Employ proven emission monitoring techniques and identify the major hazards in urea plants

Exclusive Smart Training Kit - H-STK®



Participants of this course will receive the exclusive “Haward Smart Training Kit” (H-STK®). The H-STK® consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.

Who Should Attend


The course provides an overview of all significant aspects and considerations of urea manufacturing process technology for engineers and other technical staff working in the urea industry, particularly those who have recently assumed new responsibilities, to increase their technical knowledge in urea production. The course is also beneficial for experienced engineers who want to have better knowledge on the new technologies in the industry. The course will help to improve the participants’ skills and broaden their vision and understanding of the entire industry, including technology, economics, energy, use, safety, and environmental stewardship.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

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British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

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The International Accreditors for Continuing Education and Training (IACET - USA)

Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:



Mr. Mervyn Frampton is a **Senior Process Engineer** with over **30 years** of industrial experience within the **Oil & Gas, Refinery, Petrochemical** and **Utilities** industries. His expertise lies extensively in the areas of **Process Troubleshooting, Distillation Towers, Fundamentals of Distillation** for Engineers, **Distillation Operation and Troubleshooting, Advanced Distillation Troubleshooting, Distillation Technology, Vacuum Distillation, Distillation Column Operation & Control, Oil Movement**

Storage & Troubleshooting, Process Equipment Design, Piping Systems, Applied Process Engineering Elements, Process Plant Optimization, Revamping & Debottlenecking, Process Plant Troubleshooting & Engineering Problem Solving, Process Plant Monitoring, Catalyst Selection & Production Optimization, Operations Abnormalities & Plant Upset, Process Plant Start-up & Commissioning, Clean Fuel Technology & Standards, Flare, Blowdown & Pressure Relief Systems, Oil & Gas Field Commissioning Techniques, Pressure Vessel Operation, Gas Processing, Chemical Engineering, Process Reactors Start-Up & Shutdown, Gasoline Blending for Refineries, Urea Manufacturing Process Technology, Continuous Catalytic Reformer (CCR), De-Sulfurization Technology, Advanced Operational & Troubleshooting Skills, Principles of Operations Planning, Rotating Equipment Maintenance & Troubleshooting, Hazardous Waste Management & Pollution Prevention, Heat Exchangers & Fired Heaters Operation & Troubleshooting, Energy Conservation Skills, Catalyst Technology, Refinery & Process Industry, Chemical Analysis, Process Plant, Commissioning & Start-Up, Alkylation, Hydrogenation, Dehydrogenation, Isomerization, Hydrocracking & De-Alkylation, Fluidized Catalytic Cracking, Catalytic Hydrodesulphuriser, Kerosene Hydrotreater, Thermal Cracker, Catalytic Reforming, Polymerization, Polyethylene, Polypropylene, Pilot Water Treatment Plant, Gas Cooling, Cooling Water Systems, Effluent Systems, Material Handling Systems, Gasifier, Gasification, Coal Feeder System, Sulphur Extraction Plant, Crude Distillation Unit, Acid Plant Revamp and Crude Pumping. Further, he is also well-versed in HSE Leadership, Project and Programme Management, Project Coordination, Project Cost & Schedule Monitoring, Control & Analysis, Team Building, Relationship Management, Quality Management, Performance Reporting, Project Change Control, Commercial Awareness and Risk Management.

During his career life, Mr. Frampton held significant positions as the **Site Engineering Manager, Senior Project Manager, Process Engineering Manager, Project Engineering Manager, Construction Manager, Site Manager, Area Manager, Procurement Manager, Factory Manager, Technical Services Manager, Senior Project Engineer, Process Engineer, Project Engineer, Assistant Project Manager, Handover Coordinator and Engineering Coordinator** from various international companies such as the **Fluor Daniel, KBR South Africa, ESKOM, MEGAWATT PARK, CHEMEPIC, PDPS, CAKASA, Worley Parsons, Lurgi South Africa, Sasol, Foster Wheeler, Bosch & Associates, BCG Engineering Contractors, Fina Refinery, Sapref Refinery, Secunda Engine Refinery** just to name a few.

Mr. Frampton has a **Bachelor's degree in Industrial Chemistry** from **The City University in London**. Further, he is a **Certified Instructor/Trainer, a Certified Internal Verifier/Trainer/Assessor** by the **Institute of Leadership & Management (ILM)** and has delivered numerous trainings, courses, workshops, conferences and seminars internationally.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures
- 20% Practical Workshops & Work Presentations
- 30% Hands-on Practical Exercises & Case Studies
- 20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Fee

US\$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Howard Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	<i>Registration & Coffee</i>
0800 – 0815	<i>Welcome & Introduction</i>
0815 – 0830	PRE-TEST
0830 – 0930	<i>A Global Overview & Outlook of the Nitrogen Fertilizer Industry</i> <i>Fertilizer Terminology • Fertilizer Materials & Product Types • Characteristics of Efficient Distribution Systems • Physical Properties of Fertilizer</i>
0930 – 0945	<i>Break</i>
0945 – 1100	<i>A Global Overview & Outlook of the Nitrogen Fertilizer Industry (cont'd)</i> <i>Chemical Characteristics of Fertilizers • Sampling of Fertilizers • Automatic Sampling Equipment • Fertilizer Regulations</i>
1100 – 1230	<i>Anmonia Production</i> <i>Steam Reforming of Natural Gas • Excess Air Secondary Reforming • Heat Exchange Autothermal Reforming</i>
1230 – 1245	<i>Break</i>
1245 – 1420	<i>Anmonia Production (cont'd)</i> <i>Partial Oxidation of Hydrocarbons • Hydrogen Production</i>
1420 – 1430	Recap
1430	<i>Lunch & End of Day One</i>



Day 2

0730 – 0900	Ammonia Production (cont'd) Nitrogen Addition • Removal of Carbon Monoxide • Water Removal
0900 – 0915	Break
0915 – 1100	Ammonia Production (cont'd) Removal of Carbon Oxides • Synthesis of Ammonia
1100 – 1230	Urea Process Technologies Urea Plants Installations • Description of BAT Production Processes
1230 – 1245	Break
1245 – 1420	Urea Process Technologies (cont'd) Process Water sources and Quantities • Prilling and Granulation
1420 – 1430	Recap
1430	Lunch & End of Day Two

Day 3

0730 – 0930	Urea Process Technologies (cont'd) Feasible and Available Emission Abatement Techniques • Description of Process Water BAT Treatment Systems
0930 – 0945	Break
0945 – 1100	Urea Process Technologies (cont'd) Prill Tower Emissions • Granulator Emissions
1100 – 1215	Urea Process Technologies (Storage & Transfer Equipment) Ammonia
1215 – 1230	Break
1230 – 1420	Urea Process Technologies (Storage & Transfer Equipment) (cont'd) Carbon Dioxide • Formaldehyde
1420 – 1430	Recap
1430	Lunch & End of Day Three

Day 4

0730 – 0930	Urea Uses & Outlook
0930 – 0945	Break
0945 – 1100	Urea & the Environment (Environmental Data) Inputs • Outputs
1100 – 1215	Urea & the Environment (Environmental Data) (cont'd) Typical Inputs for BAT Synthesis/Prilling Processes • Typical Inputs for BAT Melt Granulation Process
1215 – 1230	Break
1230 – 1420	Urea & the Environment (Environmental Data) (cont'd) Production Outputs • Emissions and Waste
1420 – 1430	Recap
1430	Lunch & End of Day Four

Day 5

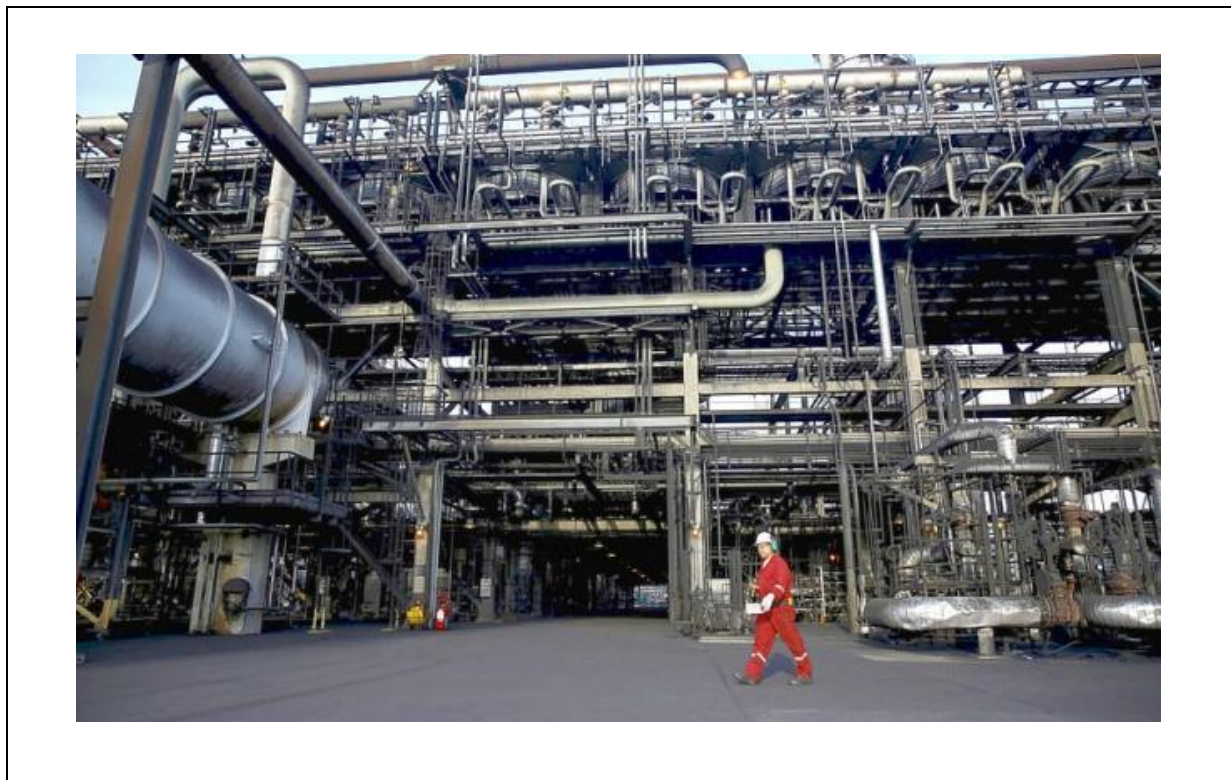
0730 – 0930	Urea & the Environment (Environmental Data) (cont'd) Environmental Hazards Associated with Emissions • Statutory Emissions Limit Values (ELVs) • Environmental Quality Standards (EQSs)
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0930 – 0945	Break
0945 – 1100	Urea & the Environment (Emission Monitoring) Parameters and Frequency of Monitoring • General
1100 – 1215	Urea & the Environment (Major Hazards) Corrosion Protection in Urea Plants
1215 – 1230	Break
1230 – 1345	Urea & the Environment (Major Hazards) (cont'd) Explosive Gas Mixtures • Hazard Study
1345 – 1400	Course Conclusion
1400 – 1415	POST-TEST
1415 – 1430	Presentation of Course Certificates
1430	Lunch & End of Course

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-



Course Coordinator

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