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COURSE BROCHURE

Hydrocracking and Hydrotreating Process Technology Training Course

6 – 10 September 2027
Rome

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Registered in the United Kingdom and Saudi Arabia

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Ref: 1579_57966 **Date:** 6 – 10 September 2027 **Location:** Rome **Fees:** 7200 GBP

Hydrocracking and Hydrotreating Process Technology is a 1-week training course for refinery process engineers, unit operators and technical support staff who run hydroprocessing units, and it ends with a Hydroprocessing Unit Health Check for one unit. Tighter fuel sulphur limits, heavier crude slates and costly catalyst changeouts make hydrogen-based conversion a deciding factor in refinery margin. Jupiter Prime Training delivers Hydrocracking and Hydrotreating Process Technology for downstream operating teams.

Why Hydrocracking and Hydrotreating Process Technology Matters Now

Three forces shape hydroprocessing today: clean-fuel specifications that push desulphurisation severity higher, opportunity crudes and cracked stocks that bring more nitrogen, metals and asphaltenes into the feed, and hydrogen that has become one of the costliest utilities on site. A well-run unit holds product quality, reaches its planned cycle length and protects reactor internals. A poorly run one suffers early pressure drop, temperature excursions and unplanned shutdowns for catalyst replacement. The course rests on reaction kinetics, the weighted average bed temperature WABT concept, hydrogen partial pressure control and structured root-cause troubleshooting.

Who Gains Most from Hydrocracking and Hydrotreating Process Technology

- Process engineers responsible for unit monitoring, yield targets and catalyst performance tracking
- Panel and field operators responsible for reactor temperature control and safe start-up and shutdown
- Technical service staff responsible for test runs and catalyst vendor liaison
- Planning and economics staff responsible for feed selection and hydrogen balance
- Inspection and reliability staff responsible for high-pressure equipment and corrosion threats

A refinery shift team gains most when its process engineer, lead operator and technical service specialist attend together and agree one set of operating limits.

Hydrocracking and Hydrotreating Process Technology Capabilities

Participants leave able to read a hydroprocessing unit through its temperatures, pressures and product tests.

- Calculate WABT and normalised activity from operating records — supporting catalyst changeout timing
- Assess feed contaminants against catalyst tolerance — guiding crude and cracked stock selection
- Specify hydrogen partial pressure and treat gas ratios — balancing conversion against coke laydown
- Weigh conversion, selectivity and cycle length — informing planners on yield trade-offs
- Apply root-cause troubleshooting to pressure drop and exotherms — protecting reactor integrity
- Design a start-up, sulphiding and shutdown checklist — aligning operators with process engineering

Key Hydrocracking and Hydrotreating Process Technology Terms

- Hydrotreating — catalytic removal of sulphur, nitrogen, metals and olefins from a feed using hydrogen, with little change in boiling range.
- Hydrocracking — catalytic conversion of heavy gas oils into lighter distillates and naphtha under high hydrogen pressure.
- WABT — weighted average bed temperature, a single figure describing reactor severity that rises as catalyst activity declines.
- Hydrogen partial pressure — the share of reactor pressure provided by hydrogen, the main lever against coke formation.
- Catalyst sulphiding — converting fresh metal-oxide catalyst into its active sulphide form before oil is introduced.
- End of run — the point where temperature, pressure drop or product quality limits force a catalyst change.

Hydrocracking and Hydrotreating Process Technology Day by Day

Day 1: Hydroprocessing in the Refinery Flow Scheme

- Refinery Configuration Map — Where Hydrotreaters And Hydrocrackers Fit
- Clean Fuel Specifications — Setting Desulphurisation Severity Targets
- Feed Characterisation And Contaminants — Screening Crudes And Cracked Stocks
- Hydrotreating Reaction Chemistry — Ranking Sulphur, Nitrogen And Aromatics Removal
- Hydrocracking Reaction Pathways — Balancing Cracking Against Hydrogenation

Day 2: Catalysts and Reactor Design

- Catalyst Types And Supports — Choosing Pretreat, Cracking And Guard Beds
- Catalyst Loading Patterns — Avoiding Channelling And Maldistribution
- Reactor Internals And Distributor Trays — Preventing Hot Spots
- Quench Systems And Bed Temperature Control — Managing Exotherms Safely
- Single-Stage And Two-Stage Hydrocracker Layouts — Matching Product Slate Goals

Day 3: Hydrogen and Process Variables

- Hydrogen Balance And Make-Up Supply — Securing Purity And Volume
- Recycle Gas Compressor And Amine Scrubbing — Holding Partial Pressure
- Space Velocity And Treat Gas Ratio — Setting Severity For Throughput
- WABT Trending And Activity Normalisation — Forecasting End Of Run
- High-Pressure Separator And Fractionation — Meeting Product Cut Points

Day 4: Deactivation, Run Length and Troubleshooting

- Coke And Metals Deactivation Mechanisms — Deciding Feed Limits
- Pressure Drop Build-Up — Choosing Skimming Or Full Changeout
- Temperature Runaway Prevention — Applying Emergency Depressuring Logic
- Corrosion In Effluent Air Coolers — Controlling Ammonium Salts
- Root-Cause Troubleshooting Method — Separating Symptoms From Causes

Day 5: Practising the Hydroprocessing Unit Health Check

- Sulphiding And Start-Up Sequence — Writing The Operator Checklist
- Feed Screening Applied — Testing A Proposed Crude Change
- Activity Trend Applied — Estimating Remaining Cycle Length
- Troubleshooting Case Applied — Diagnosing A Rising Pressure Drop
- Hydroprocessing Unit Health Check — Completing The Report For Management

Applying Hydrocracking and Hydrotreating Process Technology After the Course

- Build a WABT and normalised activity trend for one reactor from the last six months of operating records and share the end-of-run estimate.
- Run a feed contaminant review with planners before the next crude or cracked stock change.

Hydrocracking and Hydrotreating Process Technology Questions FAQ

What is hydrocracking and hydrotreating process technology and why does it matter now?

It is the use of hydrogen and catalysts to clean and convert refinery streams into on-specification fuels. It matters now because stricter sulphur limits, heavier feeds and costly hydrogen make unit performance central to margin.

Which roles gain most from hydrocracking and hydrotreating process technology training?

Process engineers, panel operators, technical service staff and planners gain most. Each influences severity, hydrogen use or catalyst life, and the course gives them shared language and limits.

How does hydrocracking and hydrotreating process technology differ from a refining fundamentals course?

It goes deep into one family of units rather than surveying the whole refinery. A fundamentals course explains distillation, cracking and blending broadly, while this one works on catalysts, WABT, hydrogen partial pressure and troubleshooting.

What do you bring back from hydrocracking and hydrotreating process technology training?

You bring back a Hydroprocessing Unit Health Check for one unit, with activity trends, feed limits, an end-of-run estimate and a start-up checklist.

Hydrocracking and Hydrotreating Process Technology: The Way Forward

The Hydroprocessing Unit Health Check first informs the decision on when to plan the next catalyst changeout. Process engineers keep it current, operators use its limits on shift and planners check feed choices against it. After the first cycle, revisit the deactivation assumptions, because each new catalyst load and crude slate shifts the curve.