

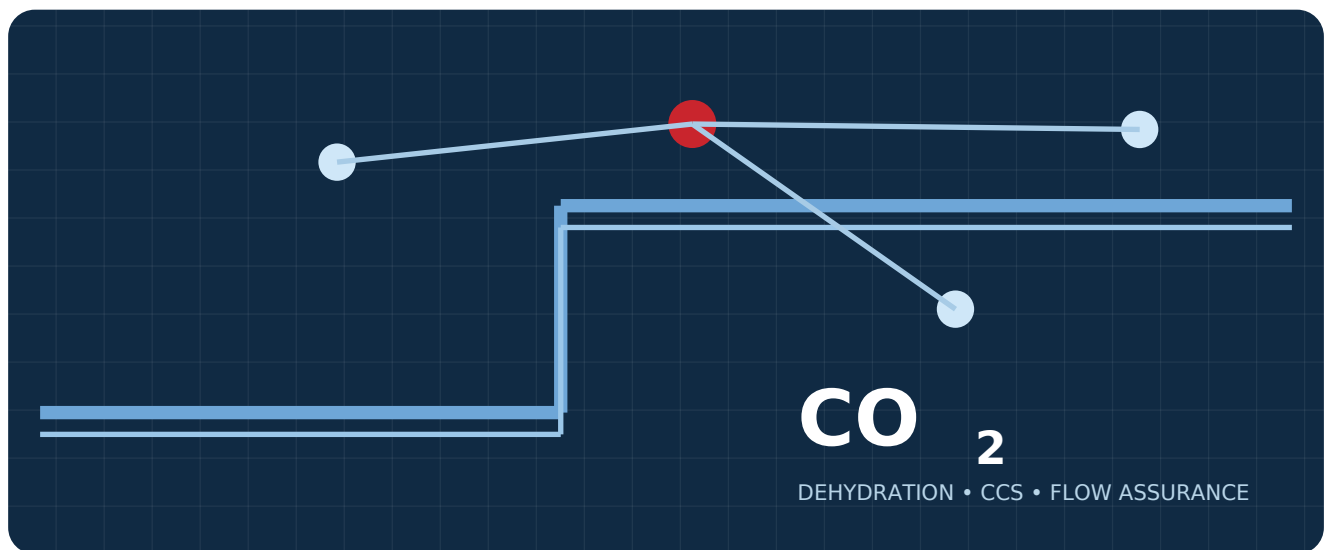


PROFESSIONAL TRAINING COURSE

CO₂ Dehydration

Advanced Methods, Challenges, and Applications

Enhancing Industrial Performance through Optimized CO₂ Streams



**5-DAY ADVANCED
COURSE**

CCS • CO₂ TRANSPORT • EOR • INDUSTRIAL APPLICATIONS

London Petroleum Institute (LPI) — UK-based professional training for energy and industry.

CO₂ Dehydration

Advanced Methods, Challenges, and Applications

Why Enroll in this Training?

In Carbon Capture and Storage (CCS), CO₂ dehydration is as vital as capture itself. CO₂ can become saturated with moisture during capture—particularly when aqueous amine solutions are used—creating wet CO₂ that can be highly corrosive and unsuitable for downstream transport or storage without adequate dehydration.

Traditional TEG systems can reduce water content to below 100 ppmv, while stricter pipeline specifications may require less than 50 ppmv and, in some operations, even lower moisture levels. This advanced course equips professionals to refine dehydration processes, address operational challenges, and maximize the utility of CO₂ streams.

Key Industry Focus

- Advanced adsorption, membrane separation, and chemical absorption technologies.
- Optimization of dehydration systems to consistently achieve target moisture levels.
- Operational challenges including corrosion, fouling, scaling, and high energy consumption.
- Applications of dehydrated CO₂ across EOR, food and beverage, and CCS.
- Practical knowledge sharing and best practices for continuous process improvement.

Course Goals

- Build a deep understanding of CO₂ dehydration processes and their industrial relevance.
- Equip participants with knowledge of advanced adsorption and membrane technologies.
- Address common operational issues such as corrosion and energy consumption.
- Explore diverse applications for dehydrated CO₂ in EOR, food and beverage, and CCS.
- Encourage collaboration and best-practice sharing to foster innovation.

INDUSTRIAL PERFORMANCE

Optimize CO₂ streams • Improve reliability • Reduce operational risk • Support sustainable utilization

Learning & Application

What You Will Learn

- Deep dive into advanced dehydration technologies including adsorption, membrane separation, and chemical absorption.
- Optimize dehydration systems to consistently achieve target moisture levels.
- Tackle corrosion, fouling, and high energy consumption in CO₂ dehydration processes.
- Understand applications of dehydrated CO₂ in Enhanced Oil Recovery (EOR), food and beverage, and CCS.
- Collaborate and share best practices to foster innovation in CO₂ dehydration.

Who Should Attend

Designed for professionals working across process engineering, production, corrosion, EOR, operations, environmental performance, energy analysis, CCS, natural gas processing, and biogas upgrading.

● Process Engineers	● Production Engineers
● Corrosion Engineers / Scientists	● EOR Engineers
● Plant Operators	● Technical Managers
● Environmental Scientists	● Energy Analysts
● CCS Researchers	● Natural Gas Processing & Biogas Upgrading Specialists

Course Delivery

- Lectures and expert-led technical presentations.
- Interactive workshops and collaborative discussions.
- Real-world case studies and operational examples.
- Hands-on exercises focused on practical application.
- Comprehensive slides, reference handouts, and additional resources.

Key Highlights

- Gain expertise in advanced CO₂ dehydration techniques and industrial applications.
- Develop practical skills to optimize dehydration units and water removal.
- Learn to tackle corrosion and fouling while improving energy efficiency.
- Discover emerging uses and trends in dehydrated CO₂.
- Network with industry leaders and peers through knowledge-sharing activities.

Course Outline

Five days of progressive learning—from fundamentals and technology selection to operational optimization and industrial application.

DAY 1

CO₂ Dehydration Basics

- Fundamentals of CO₂ dehydration and its significance across industries.
- Thermodynamics of moisture removal from CO₂.
- Conventional dehydration methods and operating principles.
- Impact of moisture on CO₂ quality and usability.

DAY 2

Advanced Dehydration Technologies

- Adsorption techniques: Pressure Swing Adsorption (PSA) and Temperature Swing Adsorption (TSA).
- Membrane separation for selective water removal.
- Chemical absorption and desiccant-based systems.
- Equipment selection and process enhancement factors.

DAY 3

Overcoming Dehydration Challenges

- Common challenges: corrosion and fouling in dehydration systems.
- Strategies to improve reliability and mitigate operational issues.
- Techniques to reduce energy use while maintaining performance.
- Scaling up advanced dehydration technologies.

PROGRESSION

Understand → Select → Optimize → Apply → Improve

PROGRESSION

Course Outline

DAY 4

Industrial Applications of Dehydrated CO₂

- Uses of dehydrated CO₂ in EOR, CCS, and food and beverage.
- Role of CO₂ in EOR as a solvent.
- CO₂ in greenhouse gas reduction through CCS initiatives.
- New applications and trends in sustainable CO₂ utilization.

DAY 5

Best Practices and Case Studies

- Best practices in design, operation, and maintenance of CO₂ dehydration units.
- Real-world examples of successful dehydration projects.
- Interactive sessions addressing specific challenges and improvement opportunities.
- Continuous process innovation and enhancement.

Course Benefits

PERSONAL IMPACT	ORGANIZATIONAL IMPACT
• In-depth knowledge of CO₂ dehydration and its industrial applications. • Practical experience in operating and optimizing dehydration systems. • Stronger problem-solving skills for CO₂ processing challenges. • Awareness of emerging industry trends and evolving CO₂ uses. • Professional networking with experts and peers.	• Strengthen compliance with CO₂ emissions standards and regulations. • Enhance operational efficiency through improved monitoring and management. • Implement mitigation strategies that support sustainability. • Reduce regulatory and operational risk. • Promote a culture of environmental responsibility.

Training Value

What Participants Take Away

- A stronger technical foundation in CO₂ dehydration and moisture control.
- Practical approaches for selecting and optimizing advanced dehydration technologies.
- Methods for addressing corrosion, fouling, energy use, and scale-up challenges.
- A clearer understanding of dehydrated CO₂ applications across EOR, CCS, and food and beverage.
- Best-practice perspectives that can be transferred to real operational environments.

OPTIMIZE CO₂ STREAMS

BUILD PRACTICAL EXPERTISE

IMPROVE INDUSTRIAL
PERFORMANCE

About the Training

This advanced training is designed to empower professionals with the tools and knowledge to optimize CO₂ dehydration, address current operational challenges, and identify future opportunities for enhanced industrial performance.

LONDON PETROLEUM INSTITUTE

Professional training for the energy and industrial sectors.
UK-based institute.

GET IN TOUCH

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Course title: CO₂ Dehydration: Advanced Methods, Challenges, and Applications
Subtitle: Enhancing Industrial Performance through Optimized CO₂ Streams