

PETROLEUM REFINING 101

June 6-7, 2017
EUCI Offices
4601 DTC Blvd.
Denver, CO



EUCI is authorized
by IACET to offer
1.0 CEUs for the
course

OVERVIEW

The abundance of heavier crude oil has led to the evolution of flexible refining operations capable of producing more valuable finished products from a variety of feedstocks.

This course will present an overview of modern, sophisticated petroleum refining. Each refining process will be presented in detail. Participants will gain an understanding of the properties of crude oil and refined products. They will learn about gasoline production, hydrocarbon processing, and catalysts in refining. Over the course of two days, attendees will develop knowledge of sulfur recovery, corrosion in refineries, and refinery cost estimation. They will leave with an understanding of how to evaluate investments in the refining industry. The instructor, who has decades of “boots on the ground” experience will utilize case studies from his career as a refinery manager for some of the largest refining companies in the United States.

LEARNING OUTCOMES

- Investigate petroleum refining and energy demand
- Discuss the properties that distinguish different grades of crude oil
- Define the typical products of refining and their specifications
- Discover the methods used to create clean and reformulated fuels
- Evaluate the use of catalysts in petroleum refining
- Examine the production of gasoline and diesel products
- Discuss the role of heavy oil upgraders
- Manage sulfur in the refining process
- Discover LP modeling and refinery economics
- Estimate refinery CAPEX and OPEX
- Specify materials for construction and estimate the cost of investments



“Perfect course context to understand the refining process.”

Business Development Manager, Siemens



“This course is a must for regulators to understand the refining process. The knowledge gained is immediately relevant and applicable to your every day job.”

Fire Marshal, Contra Costa Fire



“EUCI Petroleum Refining 101 covered a great deal of information explaining the basics of refining.”

Sr. Application Engineer, Leistriz

COURSE TIMING

TUESDAY, JUNE 6, 2017

8:00 – 8:30 am	Registration and Continental Breakfast
8:30 am – 5:00 pm	Course Timing
12:00 – 1:00 pm	Group Luncheon

AGENDA

Introductions, Expectations and a Safety Moment

Petroleum Refining and Energy Demand

- Early history of refining
- Composition of crude oil
- Energy demand
- Crude oil supply
- Oil prices

Crude Oil Characterization

- Properties that distinguish different crudes
 - o Hydrocarbons
 - o Sulfur
 - o Other contaminants
- Crude oil characteristics
- Crude assay
- Product cut points and destinations

Crude Oil Distillation

- Early uses of petroleum
- First commercial refinery
- Development of crude distillation
- Current uses of crude oil
- Composition and cut point destinations
- Chemistry
- Process overview

Catalysts in Refining

- Importance of conversion processes
- Straight run fractions
- The distillation section of refineries
- Types of catalysts
- Reforming catalysts
- Hydrotreating
- Zeolites
- Coking
- Catalyst poisons

AGENDA

TUESDAY, JUNE 6, 2017 (CONTINUED)

Gasoline Production

- Properties of gasoline
- History of gasoline's use
- Catalytic reforming
- Isomerization basics
- Hydro-isomerization process
- Mercaptan oxidation (MEROX)
- Feed specifications
- Continuous catalytic regeneration (CCR)
- C4 isomerization process
- UOP butamer process
- UOP penex process
- Gasoline specifications
- Potential refinery modifications
- Sulfur distribution
- Octane distribution
- FCC feed treating and support units
- FCC naphtha processing
- Pool components and octanes
- Options for non-oxygenated reformulated gasoline

Hydroprocessing

- The objective of hydrotreating
- History of hydrotreating
- Feedstocks
- Sulfur removal
- N₂, O₂, metals and halides removal
- Olefin saturation
- Aromatic saturation
- Products and qualities

Catalytic Cracking

- History of catalytic cracking
- Modern FCC
- RCC overview
- RCC feedstocks
- Alkylation

Refinery Configurations and LP Modeling

- Supply chain
- Complexity of refinery operations
- LP models
- Optimization and LP
- LP applications
- Aspen PIMS
- Limitations of LP models



"This is a detailed comprehensive review of how a refinery functions."

CEO, CVR Partners



"This training allowed me to gain a basic understanding of the refining process without having much background knowledge going in."

Staff Operations Engineer,
Phillips 66

COURSE TIMING

WEDNESDAY, JUNE 7, 2017

8:00 – 8:30 am **Continental Breakfast**

8:30 am – 12:00 pm **Course Timing**

AGENDA

Clean Fuels

- Clean fuel regulations
- Changes in product specifications
- Advancement in refining techniques
- Estimated costs

Residual Oil Processing

- Separation technologies
 - o Solvent deasphalting processes
- Carbon-out technologies
 - o Mild thermal cracking
 - o Coking processes
- Residue catalytic cracking processes

Sulfur Recovery

- Three-stage ammonia burning claus process
- SRU burner evaluation
- Turn down
- Ammonia burning claus technology
- Reaction furnace
- Ammonia destruction
- Choke-ring effects
- Catalyst requirements
- Tail gas treating
- BSR-TGU design vs. SCOTT
- Sulfur degassing technologies
- Oxygen enrichment & BOC SURE technology

Corrosion in Refining

- Naphthenic acid corrosion (NAC)
- Corrosion mechanisms
- Sulfidation
- Types of corrosion
- Embrittlement and cracking
- Materials selection

AGENDA

WEDNESDAY, JUNE 7, 2017 (CONTINUED)

Cost Estimating

- Curve type estimates
- Factored estimates
- Nelson-Farrar index
- The six tenth cost principle
- Refinery unit costs and total refinery costs
- Location factors

Recent Impacts on the Refining Business

- Discussion of impact of North American shale-oil boom on refining
- Discussion of impact of Keystone Pipeline
- Discussion of proposed Tier III gasoline sulfur limitations
- Discussion of potential greenhouse gas limitations

Course Assessment, Learning Outcome Review and Q&A Session

COURSE INSTRUCTOR



Gregg Lorimor

Instructor, Previously with Holly Frontier Corporation

Mr. Lorimor recently retired after serving in a variety of positions in Engineering, Operations, and Refinery Management in over 40 years in the oil refining business. He spent 15 years with Conoco, Inc. (prior to the merger with Phillips) as a Refinery Process Engineer, an Economic Analyst, and an Operations Manager. Following, he was with Kerr McGee Refining Corporation as an Operations Manager and a Refinery Manager at their plant in Wynnewood, Oklahoma. Later he moved to Sinclair Oil where he served as Technical Manager, Operations Manager and Refinery Manager at the Sinclair Refineries in Tulsa, Oklahoma and Sinclair, Wyoming. Mr. Lorimor finished his career as a Senior Engineering Specialist with Holly Frontier Corporation. He has a Bachelor of Science Degree in Chemical Engineering from Iowa State University.



“EUCI’s Petroleum Refining 101 was a great refresher course after returning to the business 30 years ago. The materials, topics, and discussions renewed my fascination with oil & gas refining and bringing new solutions to my customers.”

Director, Business Development Refining & Chemical, Valin Corporation

REQUIREMENTS FOR SUCCESSFUL COMPLETION OF PROGRAM

Participants must sign in/out each day and be in attendance for the entirety of the course to be eligible for continuing education credit.

INSTRUCTIONAL METHODS

Case studies and PowerPoint presentations will be used in this program.

IACET CREDITS



EUCI has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, EUCI has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Authorized Provider status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

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EVENT LOCATION

EUCI Offices

4601 DTC Blvd.
Denver, CO 80237

NEARBY HOTELS

Hyatt Regency Denver Tech Center

7800 E. Tufts Ave
Denver, CO 80237
Phone: 303-779-1234
0.3 miles away

Hilton Garden Inn Denver Tech Center

7675 E. Union Ave
Denver, CO 80237
Phone: 303-770-4200
0.6 miles away

Denver Marriott Tech Center

4900 S. Syracuse St
Denver, CO 80237
Phone: 303-779-1100
0.7 miles away

Hyatt Place Denver Tech Center

8300 E. Crescent Parkway
Greenwood Village, CO 80111
Phone: 303-804-0700
0.9 miles away

REGISTRATION
to register [CLICK HERE](#) or

Call: 201 871 0474
fax: 253 663 7224
email: register@pmaconference.com
web: <http://pmaconference.com/>
Mail: POB 2303 Falls Church Va 22042

Please make checks payable to: "PMA"

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See nearby hotels on page 7

PLEASE REGISTER

PETROLEUM REFINING 101 COURSE:
 June 6-7, 2017 | Denver, CO: US \$1395,
 Early bird on or before May 19, 2017: US \$1195

How did you hear about this event? (direct e-mail, colleague, speaker(s), etc.)

Print Name Job Title

Company

What name do you prefer on your name badge?

Address

City State/Province Zip/Postal Code Country

Phone Email

List any dietary or accessibility needs here

CREDIT CARD INFORMATION

Name on Card Account Number

Billing Address Billing City Billing State

Billing Zip Code/Postal Code Exp. Date Security Code (last 3 digits on the back of Visa and MC or 4 digits on front of AmEx)

OR Enclosed is a check for \$ _____ to cover _____ registrations.

Substitutions & Cancellations

Your registration may be transferred to a member of your organization up to 24 hours in advance of the event. Cancellations must be received on or before May 5, 2017 in order to be refunded and will be subject to a US \$195.00 processing fee per registrant. No refunds will be made after this date. Cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other EUCI event. This credit will be good for six months from the cancellation date. In the event of non-attendance, all registration fees will be forfeited. In case of course cancellation, EUCI's liability is limited to refund of the event registration fee only. For more information regarding administrative policies, such as complaints and refunds, contact our offices at (201) 871-0474.