COURSE OUTLINE

BUSINESS, MANAGEMENT AND ECONOMICS

Understanding the dynamics of the industry from the perspective of economics and costs

DAY 1 MORNING

Macroeconomic Environment

- Growth measurements and GDP
- Understanding growth differences between regions and countries
- The role of demographics
- Future prospects
- A template to understand how the economy works

The Business Cycle

- Why our industry is cyclical
- Timing of the business cycle
- Chemical industry and general economy cycles
- Demand sensitivity to downturns: which segments are more vulnerable
- Opportunities and threats along the cycle
- Strategic implications

Feedstocks

The energy context

- Split of major energy uses
- Gas, oil, and coal: who has the reserves
- Oil prices: how the energy world has changed
- The interface between energy and chemicals

Feedstock Prices

- Understanding price relationships between different feedstocks and their historical relationships:
- Crude oil, naphtha and premium gasoline
- Natural gas liquids (NGLs) and liquefied petroleum gas (LPG)
- Why naphtha prices tend to be global and gas prices tend to be regional

DAY 1 AFTERNOON

The Basic Petrochemical Building Blocks

- Ethylene, Propylene, and the C4s
- Benzene, Toluene, and Xylenes
- Synthesis Gas (Syngas) from methane and coal: syngas to olefins (CTO, MTO/MTP)
- Overview of the value chains and the petrochemical universe

Cost of Production

Building the cost of production

- Cost build-up
- How to calculate cost of production (COP)
- Reading the COP sheet
- Variable and fixed cost components
- Understanding by-product credits
- Single-feed and mixed-feed crackers
- Other on-purpose sources of chemicals

Exercise: Cracker Economics Case Study

- Cracker Economics (ethane versus naphtha)
- Difference between cracking gases (ethane) vs liquids (naphtha)
- Discussion on different feedstock prices and by-product mix
- Individual and team discussion

Competitiveness

Cost Curves

- Explaining the concept of Cost Curves
- Curves based on cost or product delivered to market
- What we can predict with cost curves: equilibrium pricing and competitiveness

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DAY 2 MORNING

Competitiveness (continued)

Comparative Economics

- Working a live cost of production sheet
- Regional dynamics: comparing feedstocks and utility costs for different regions
- Economies of scale, why size matters
- Understanding differences in capital investment: scale and location factors
- Exercise: building a cost curve from scratch for different production facilities

Transfer Prices

- The dynamics of transfer prices
- Who makes the profit?
- Analysing comparable results
- Exercise: Calculating the cost of production of an integrated ethylene and polyethylene player and make a sale decision based on transfer pricing policies
- The Value Chain

Concept of the Value Chain

- Chemical companies do not operate in isolation
- Value chain complexity
- Upstream and downstream
- Operating rates and margins
- Degrees of strength along the chain: monopolies, end-users with buyer power: players with feedstock or logistics advantage
- Business strategy development within the value chain: analysing competition in the industry
- building blocks and main derivatives

Exercise: Business Simulation

- Group exercise in five teams. Teams represent different players along the value chain and will review changing variables in different scenarios:
- Team 1: Refinery
- Team 2: Petrochemical producer
- Team 3: Plastics converter
- Team 4: Shampoo manufacturer
- Team 5: Retailer

DAY 2 AFTERNOON

Project Evaluation

Investment Categories

- Project costs
- Category definitions: from Class 5 to Class 1
- Capex categories
- ISBL: Inside Battery Limits
- OSBL: Outside Battery Limits,
- Other project costs and Working capital
- Location factors
- Lump-sum turnkey versus reimbursable

Project Feasibility

- Accounting Background
- Accounting background
- Income statement
- Balance sheet
- Cash flow statements
- How the three statements are linked

Financial Modelling in the Chemical Industry

- General setup for financial models
- Control page, techno-economics, prices and transfers between different process plants
- Forming the base case
- Understanding discount rates
- Terminal value
- Key metrics (net present value, internal rate of return, and other metrics)
- What the numbers mean

Sensitivities

- What sensitivity analysis can tell us
- Sensitivities to product and feedstock prices
- Sensitivities to capital expenditure (overruns, delays, etc.)
- Other sensitivities
- Monte Carlo simulation

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DAY 3 MORNING

Exercise: Building a Financial Model
Group exercise in teams to understand how project evaluation works: building the base case, calculating the main metrics, and running sensitivities to the following variables:

- Increase in raw material prices
- Changes in sales prices
- Reduced operating rates
- Delay in project start-up and capex overrun
- Discuss main findings

Price Forecasting

- Understanding Sources
- Price forecast sources
- Incoterms and price adjustments
- Understanding price setting mechanisms
- Spot versus contract prices

Building Price Forecasts

- Methodology
- Oil price scenarios
- Linking supply/demand models and cost models
- The impact of trade
- Operating rates and industry profitability
- How everything links together
- Price competition boundaries

Strategy

- Fundamentals
- Strategic frameworks
- Porter's five forces
- SWOT Analysis
- Scenario planning
- Prospective studies
- Other models

DAY 3 AFTERNOON

Strategy (continued)
Trends

- Trends in the chemical industry
- Integration
- Low cost versus differentiation
- Shift between commodities and specialties
- Are chemicals from renewables attractive
- External forces
- Case study 1: Greenpeace and Shell
- Case study 2: What would electric cars mean for the chemical industry

Competition

- Different Strategies for Success
- Upstream driven
- Advantaged feedstocks
- Regional strength
- R&D driven

Exercise: Competitor Profiles

- Review the history and competitive position of major players in the chemical industry:
- ExxonMobil (USA)
- SABIC (Saudi Arabia)
- Reliance Industries Ltd. (India)
- BASF (Germany)

Research the background and locate each of the competitors in a competitive matrix.
Closing Discussion
Review Of Main Topics
Conclusion Of The Course

ABOUT THE PRESENTER

Manuel Asali is a Vice President at NexantECA and is responsible for Nexant Training globally. Manuel is a Chemical Engineer and has an MBA from London Business School. He has 30 years of experience in the petrochemical industry working for a number of companies including PEMEX in Mexico and SABIC in Saudi Arabia. As instructor of the course, **Manuel brings a unique combination of broad knowledge of the global petrochemical industry complemented with his experience in strategy, marketing and sales**. Manuel delivers numerous training courses throughout the year. He is a lively presenter and a regular speaker at petrochemical industry forums and conferences.