

## Curriculum of Chemical Engineering Bundle

### Course 01: Basic Chemistry Online Course

- Introduction to Basic Chemistry
- Understanding Matter
- Atom
- Chemical Bonding
- Energy
- Periodic Table
- Intermolecular Forces
- Gases
- Solution
- Chemical Equilibrium
- Kinetics and Equilibrium
- Acids and Bases
- pH and pOH
- Reactions Involving Acids and Bases
- Redox Reaction
- Electricity and Chemistry
- Inorganic Chemistry
- Organic Chemistry
- Biochemistry
- Nuclear Chemistry
- Industrial Chemistry
- Environmental Chemistry
- Laboratory Safety
- Chemical Hygiene Plan

### Course 02: Organic Chemistry

- Alkane series
- Alkene Series
- Alkanol Series
- Alkyne series
- Alkanals and Aldehydes
- Nomenclature Practices

### **Course 03: Organic Chemistry Demystified**

- About the Course
- Drawing Organic Molecules
- Resonance
- Acid-Base Reactions
- Geometry
- Nomenclature
- Conformations
- Configurations
- Mechanisms
- Substitution Reactions
- Elimination Reactions
- Substitution vs Elimination
- Addition Reactions
- Synthesis Techniques
- Wrapping Up and Bonus

### **Course 04: General Inorganic Chemistry**

- ABOUT THE COURSE
- Quantities and Units
- Atomic, Molecular and Molar Masses
- Formulas and Compositions
- Inorganic Nomenclature
- Chemical Equations
- Measurement of Gases
- The Ideal Gas Law
- Thermochemistry
- Atomic Structure
- Chemical Bonding and Molecular Structure
- Solids and Liquids
- Oxidation - Reduction
- Concentration of Solutions
- Reaction Involving Standard Solutions
- Properties of Solutions
- Thermodynamics
- Acids and Bases
- Complex Ions and Precipitates
- Electrochemistry
- Rates of Reactions

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### **Course 05: Petroleum Refining Demystified**

- About the Course
- Overview of Crude Oil Refining
- Petroleum Properties
- Distillation and Fractionation
- Converting Petroleum Cuts
- Hydrofining Petroleum Cuts
- Cracking Heavy Petroleum Cuts
- Blending Operation
- Making Asphalts
- A Typical Refinery Operation

### **Course 06: Diploma in Water Chemistry**

- Introduction to Water Chemistry
- Concepts of Basic Chemistry
- Alkalinity of Water
- Hard Water and Basic Water Treatment Principles
- Water Treatment and Purification
- Chemical Processes of Water Treatment
- Inorganic Chemicals
- Volatile and Synthetic Organic Compounds
- Metalloid Section
- Metals and Heavy Metal Section
- Laboratory Safety
- Chemical Hygiene Plan

### **Course 07: Diploma in Water Treatment**

- Overview of Water Treatment
- Water Quality
- Wastewater Sampling and Analysis
- Preliminary Treatment
- Coagulation, Flocculation and Clarification
- Sedimentation
- Filtration
- Flotation
- Removal of Fats, Oils and Grease
- Inorganic Constituents Removal
- Ion Exchange
- Biological Process of Water Treatment
- Aerobic Processes of Biological Treatment
- Disinfection


### **Course 08: Carbon Literacy Knowledge | Course**

- Introduction to Carbon Literacy
- The Carbon Cycle
- Global Warming and Climate Change
- Solutions for Global Warming
- Steps to Take for a Cleaner Tomorrow

### **Course 09: Understand Piping & Instrumentation Diagrams P&IDs**

- INTRODUCTION
- ABOUT P&ID's
- INTRODUCTION TO P&ID READING
- BASIC P&ID SYMBOLS
- LET'S GET SOME PRACTICE : BASIC P&ID SYMBOLS
- P&ID DESIGNATION CODES
- THE IMPORTANCE OF PROCESS CONTROL
- CONTROL THEORY BASICS
- BASIC PROCESS CONTROL SYSTEMS (BPCS)
- ADVANCED PROCESS CONTROL
- SAFETY INSTRUMENTED SYSTEMS (SIS), INTERLOCKS AND ALARMS
- P&ID EXAMPLES : LET'S GET SOME PRACTICE

### **Course 10: Gas Safety**

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- Gas Safety Legislation
  - Combustion
  - Transmission System: Pipes and Flues
  - Ventilation
  - Tightness Testing
  - Meter Regulator Check
  - Appliance Pressures and Gas Rates
  - Emergency Isolation Controls and Valves
  - Gas Safety Devices and Controls
  - Gas Warning Labelling
  - Emergency and Evacuation Procedures
  - Chimney Standards, Inspection and Testing
  - Gas Appliances and Safety

### **Course 11: Electrical and Fire Safety Training - Level 2**

- Introduction and Basics
- Introduction to Fire Safety
- Voltage and Resistance
- Capacitance and Capacitors
- Safety Precautions
- Fire Safety Legislation
- Measures of Fire Safety
- Fire Emergency: Evacuation Procedures

