PETROLEUM AND INDUSTRIAL PLANTS (PIP) (PROFESSIONAL DIPLOMA)
INTRODUCTION

Most engineering industries involve the implementation of mechanical equipment, pressure vessels and piping. Selection, design, and construction of equipment rotating, or static and its relevant piping systems are performed according to special engineering procedures and standard specifications. Therefore, engineers willing to join the industrial market should learn the actual workflow and the engineering deliverables based on work experience. This program has been prepared to qualify engineers through an academic and professional path that considers the level of experience of each trainee.

PROGRAM COURSES

The scope of the offered courses is selected to cope and adapt to the current market needs and requirements. Several of the offered courses are similar to existing ESS courses (as shown below). Each course covers 30 hours of instructions.

CATEGORY A

1) PIP 001: Fundamentals of Petroleum and Industrial Plants
   This course is similar to an existing ESS course titled PGAS 001 Document Controlling and Information Management for Oil and Gas Projects

CATEGORY B

2) PIP 002: Classification, Fabrication, and Testing of Piping and Pipeline Components
3) PIP 003: Industrial Piping and Pipeline Valves Technology
   This course is similar to an existing ESS course titled
   (MPEN 008) Valves: Selection, Installation and Maintenance

4) PIP 004: Design and Construction of Piping Systems
   This course is already existing ESS course titled
   MPEN 041 Design and Construction of Piping Systems

5) PIP 005: Static Equipment Design and Fabrication
   This course is similar to an existing ESS course
   MPEN 092 Oil Tanks Design and Maintenance

6) PIP 006: Rotating Equipment Engineering
   This course is similar to an existing ESS course titled
   MPEN 044 Compressors and Pumps for Petroleum Industries

CATEGORY C (software category where all used software are demonstration versions)

7) PIP 007: Piping Stress Analysis by Caesar II
   This course is already existing ESS course titled
   MPEN 037 Piping Stress Analysis by Caesar II

8) PIP 008: Piping Design Modeling Software, PDMS

9) PIP 009: Everything 3 D, E3D
<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Date</th>
<th>Fees for Egyptians</th>
<th>Location</th>
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<tbody>
<tr>
<td>PIP 001</td>
<td>Fundamentals of Petroleum and Industrial Plants</td>
<td>Oct 4 - Oct 31, 2020</td>
<td>3,200</td>
<td>Online</td>
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<tr>
<td>PIP 002</td>
<td>Classification, Fabrication, and Testing of Piping and Pipeline Components</td>
<td>Nov 1 - 28, 2020</td>
<td>3,200</td>
<td>Online</td>
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<td>PIP 003</td>
<td>Industrial Piping and Pipeline Valves Technology</td>
<td>January 3 – 30, 2021</td>
<td>3,200</td>
<td>Online</td>
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<td>PIP 004</td>
<td>Design and Construction of Piping Systems</td>
<td>Feb 7 - March 6, 2021</td>
<td>3,200</td>
<td>Online</td>
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<td>PIP 005</td>
<td>Static Equipment Design and Fabrication</td>
<td>March 21 - April 17, 2021</td>
<td>3,200</td>
<td>Online</td>
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<td>PIP 006</td>
<td>Rotating Equipment Engineering</td>
<td>April 25 - May 8, 2021</td>
<td>3,200</td>
<td>Online</td>
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<td>PIP 007</td>
<td>Piping Stress Analysis by Caesar II</td>
<td>May 23 - June 19, 2021</td>
<td>3,200</td>
<td>Online</td>
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<td>PIP 008</td>
<td>Piping Design Modeling Software, PDMS</td>
<td>June 20 - July 17, 2021</td>
<td>3,200</td>
<td>Online</td>
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<td>PIP 009</td>
<td>Everything 3 D, E3D</td>
<td>Aug 1 - 28, 2021</td>
<td>3,200</td>
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PROGRAM REQUIREMENTS:
To complete the requirements of the Professional Diploma in Petroleum and Industrial Plants, the candidate must successfully complete the following:

A) 6 courses selected as follows,
The course of category A
- 3 courses from category B
- 1 course from category C
- 1 course from category B, or C

B) Complete an applied project based on a related industry

COURSE OUTLINES

PIP 001: Fundamentals of Petroleum and Industrial Plants
• Typical Plant
• Plant types
• Projects Types & Phases
• Roles and Responsibility
• The 7 key documents
• Technical document control
• Document distribution and approvals
• Most common engineering deliverables
• Engineering Workflow
• Instrumentation and control system
• Oil & gas processing fundamentals
• Commonly used codes & standards
• General overview for equipment in industrial plants
• Process Flow Diagram (PFD) principles & structure
• Piping and Instrumentation Diagram (PID) structure & sections
PIP 002: Classification, Fabrication, and Testing of Piping and Pipeline Components.

- Differences between piping & pipeline
- Piping Components classification
- Piping Bulk
- Piping specialties
- Piping valves
- Pipeline components
- Pigging system and procedure
- Testing & fabrication of piping & pipeline
- Common piping standers such as ASME B16.5, 49, 11, etc. …
- Common pipeline standards such as API 5L

PIP 003: Industrial Piping and Pipeline Valves Technology.

- Classification of Valves
- Manual valves
- Control valves
- PSV valves
- Valve main types Gate, Globe, Check, Ball, Plug & Butterfly
- Valve materials
- Selection and specifications of valves
PIP 004: Design and Construction of Piping Systems.
- Pressure design
- Piping sizing
- Piping material classes building
- Piping Flexibility analysis
- Type of supports
- Plot plan basics
- Piping layout basics
- Main piping related documents
- Main design codes & standards
- Fabrication methods
- Testing procedures

PIP 005: Static Equipment Design and Fabrication.
- Main design steps & engineering considerations
- Pressure vessels, (cylindrical, spherical and conical)
- Storage tanks
- Fabrication procedures
- Welding procedures and requirements
- NDE types and requirements
- Testing and examination
- Main technical criteria and specification
- Main engineering deliverables
- Workflow
PIP 006: Rotating Equipment Engineering.

Rotating equipment engineering basics
• Pumps.
• Compressors.
• Gas turbines.
• Diesel/Gas Engines.
• Mixers and static mixers.
• Fans and blowers.
• Steam turbines

Pumps applications and technology
• Pump Fundamentals.
• Pumps types and hydraulic coverage chart.
• Pumps applications and services.
• API Centrifugal pumps design and applications
• Pump Classifications

Compressors applications and technology.
• Compressor Fundamentals.
• Compressor types and hydraulic coverage chart.
• Compressor applications and services
• Reciprocating compressor applications
• Gas Compression fundamentals
• Main drivers
• Main technical criteria and specification
• Main engineering deliverables
• Workflow
**PIP 007: Piping Stress Analysis by Caesar II.**
Stress analysis background
- System modeling
- Static analysis
- Equipment code compliance
- Local stresses at nozzle-vessel intersection
- Steel structure modeling and analysis
- Dynamic analysis & Case studies

**PIP 008: Piping Design Modeling Software, PDMS.**
Introduction
- PDMS Hierarchy
- PDMS Instructions
- Graphics Settings and View Controlling
- Measuring

Equipment module
- Equipment Hierarchy
- Creating and Editing Primitives
- Creating Standard Equipment
- Positioning and Orientation control
- Collections, search options and report creation
- Piping module
- Hierarchy & Piping creation
- Piping routing
- Pipe modifications
PIP 009: Everything 3D, E3D.

Introduction
• E3D Hierarchy
• E3D Instructions
• Graphics Settings and View Controlling

Equipment module
• Equipment Hierarchy
• Creating and Editing Primitives
• Positioning and Orientation control
• Collections, search options and report creation

Piping module
• Hierarchy & Piping creation
• Piping routing
• Pipe modifications

Drawing module
• Hierarchy & drawings creation
• Creating views
• Creating dimensions & labels