



CERTIFICATE IN

FUNDAMENTALS OF PROCESS PLANT LAYOUT AND PIPING DESIGN

**12 MODULES OVER 3 MONTHS**For upcoming commencement dates, please view our course schedule at:
<http://www.eit.edu.au/schedule>

WHAT YOU WILL LEARN

- Plant layout fundamentals and work flow procedures
- Terminology and symbols used in plant layout
- Plot plans, elevations and 3-D models
- Fundamental principles of chemical process technology
- Process flow diagrams (PFDs)
- Equipment used in process plants
- Instrument symbols and abbreviations
- Piping and instrumentation diagrams (P&IDs)
- Piping design and engineering principles
- Terminology, symbols and abbreviations used in piping design
- Piping materials
- Piping specifications and piping codes
- Components of piping systems - fittings, flanges and valves
- Piping isometrics and bill of materials

Presented by

**N.S.
Nandagopal**

B.Sc (Chem Eng), M.Sc, P.E.

**ENROL NOW:** Fax the enrolment form to us,
or email enquiries@eit.edu.au

BENEFITS OF LIVE E-LEARNING

- Attend lessons in an online classroom with your instructor and fellow students
- Upgrade your skills and refresh your knowledge without having to take valuable time away from work
- Receive information and materials in small, easy to digest sections
- Learn while you travel - all you need is an Internet connection
- Have constant support from your course instructor and coordinator for the duration of the course
- Interact and network with participants from around the globe and gain valuable insight into international practice
- Learn from international industry experts, based around the globe
- Live interactive webinars, not just a 'book on the web'
- Receive a certificate of completion for CPD purposes

PRESENTATION FORMAT

The certificate program features real-world applications and use a multi-pronged approach involving self-study, interactive on-line webinars and homework assignments with a mentor on call. The course consists of 12 modules, over a period of 3 months.

Some modules may involve a practical component or group activity. For each module there will be an initial reading assignment along with coursework or problems to be handed in and practical exercises in some cases. Participants will have ongoing support from their instructor and course coordinator.

Course reading material will be delivered in electronic (PDF) format in advance of on-line presentations. Presentations and group discussions will be conducted using a live interactive software system. Assignments will be submitted electronically and wherever possible, practical exercises will be conducted using simulation software and remote labs.

LIVE WEBINARS

During the program you will participate in 6 live interactive sessions with the instructor and other participants from around the world. Each webinar will last approximately 60 to 90 minutes, and we take student availability into consideration wherever possible before schedule webinar times. Contact us for details of webinar session scheduling. All you need to participate is an adequate Internet connection, speakers and a microphone. The software package and setup details will be sent to you prior to the course.

PRESENTED BY

N.S. NANDAGOPAL

B.Sc (Chem Eng), M.Sc, P.E.



Nanda has over twenty five years of industry and academic experience in the area of process plant layout and piping design.

His experience includes work in the areas of process design, plant design, pipe stress analysis and piping engineering and design. While at Brown & Root, Nanda designed and engineered major piping systems for offshore platforms including high temperature and high-pressure lines. He has served on the Board of Directors of Society of Piping Engineers and Designers (SPED) and is constantly in touch with the trends and current practices in process plant and piping design.

Nanda has extensive experience in teaching short, intense, review courses for engineering license exams in the USA and is a registered Professional Engineer (P.E) in the State of Texas, USA. He is a passionate presenter who truly enjoys conveying complex technical concepts in a practical, down to earth manner. An effective communicator, Nanda receives excellent reviews from course participants.

12 MODULES OVER 3 MONTHS

COURSE OBJECTIVES:

Process plants, such as refineries and petrochemical plants, are complex facilities consisting of equipment, piping systems, instruments, electrical systems, electronics, computers, and control systems.

The design, engineering and construction of process plants involves a multidisciplinary team effort. Plant layout and design of piping systems constitutes a major part of the design and engineering effort. The goal is to design safe and dependable processing facilities in a cost effective manner. The fact is that there are very few formal training programs that focus on design and engineering of process plants and piping systems. Therefore, most of the required skills are acquired while on the job, reducing productivity and efficiency.

The objective of this course is to provide the delegates the basic knowledge and skills in this discipline to facilitate faster learning curves while on the job. This course will cover the fundamental principles and concepts used in process plant layout and piping design. Upon completion of this course the delegates will have a clear understanding of the design and engineering principles used in plant layout and piping design.

INCLUDES 4 FREE REFERENCE MANUALS VALUED AT OVER US\$400

YOU WILL RECEIVE 4 OF OUR UP-TO-DATE
TECHNICAL E-BOOKS TO ADD TO YOUR LIBRARY.

- Fundamentals of Process Plant Layout and Piping Design
- Practical Pumps: Design, Operation and Maintenance for Centrifugal and Positive Displacement Pumps
- Practical Process Compressors
- Practical Mechanical Seals: Selection, Maintenance and Troubleshooting

Received upon completion.

All materials required for the course will be provided electronically, in smaller, easy-to-read sections.

Please Note: e-Books are available in hard copy at 50% of the recommended retail price. Contact us for pricing details.



COURSE OUTLINE

UNIT 1: Introduction to Process Plant Layout and Piping Design

- Plant layout fundamentals
- Procedures and workflow
- Physical quantities and units

UNIT 2: Introduction to Chemical Processing Methods

- Unit operations and unit processes
- Process flow diagrams (PFDs)
- Heating and cooling utilities used in process plants
- Typical equipment specifications

UNIT 3: Equipment Used in Process Plants - I

- Process equipment
 - Reactors
 - Towers
 - Exchangers
 - Furnaces
 - Vessels
- Mechanical equipment
 - Pumps
 - Compressors
 - Turbines
- Equipment foundations and supports

UNIT 4: Equipment Used in Process Plants - II (Documents)

- Equipment data sheets
- Equipment sketches
- Equipment drawings
- Equipment nozzle specifications
- Equipment foundation drawings

UNIT 5: Plant Layout and Plot Plans

- Plant layout specifications
- Codes and safety considerations
- Development of plot plans
- Plot plan use by disciplines
- Sample plot plans and equipment arrangement drawings
- Layout case studies

UNIT 6: Piping Materials and Material Specifications

- Material properties
- Classification of materials
- Material specifications (ASTM)
- Common piping materials
- Piping specifications
- Material selection
- Material testing, inspection and QA

UNIT 7: Piping and Instrumentation Diagrams (P&IDs) - I

- P&ID basics
- Use of P&IDs by different disciplines
- Information contained in P&IDs
- Instruments and instrument symbols

UNIT 8: Piping and Instrumentation Diagrams (P&IDs) - II

- Local control, DCS and PLC
- Discussion of a sample P&ID
- Control valve manifolds
- Meter runs

UNIT 9: Plant Layout and Piping Design Documentation and Tools - I

- Piping codes
- Piping specifications
- Equipment lists
- Piping line lists

UNIT 10: Plant Layout and Piping Design Documentation and Tools - II

- Stress isometrics
- Piping isometrics and Bill of Materials
- PFDs, plot plans, and P&IDs
- 3D models

UNIT 11: Fundamentals of Pipe and Pipe Fittings

- Pipe dimensions and pipe representation
- Use of pipe data tables
- Pipe joining methods
- Pipe fittings
 - Elbows
 - Tees
 - Reducers
 - End caps
- Fitting dimensions and tables

UNIT 12: Piping System Components

- Basics of flanges
 - Flange ratings and flange types
- Flange data tables and their use
- Different types of valves and their applications
- Valve data tables
- Piping restraints
 - Supports, anchors and guides

HARDWARE AND SOFTWARE REQUIREMENTS

All you need to participate is an adequate Internet connection, PC, speakers and a microphone. The software package and setup details will be sent to you prior to the course.

ENTRANCE REQUIREMENTS

Some practical work experience in some of these topics would obviously be advantageous.



CERTIFICATION

Participants completing all the assignments, and achieving 50% or more for their final mark, will receive the Engineering Institute of Technology Certificate in Fundamentals of Process Plant Layout and Piping Design.

