

Fundamentals of Co-generation Design

Course Introduction

Combined heat and power (CHP) is an efficient and clean approach to generating electric power and useful thermal energy from a single fuel source. CHP places power production at or near the end user's site so that the heat released from power production can be used to meet the user's thermal requirements while the power generated meets all or a portion of the site's electricity needs. Applications with steady electricity and thermal energy demand are potentially good economic targets for CHP deployment.

Industrial applications, particularly in industries with continuous processing and high steam requirements, are very good candidates to apply CHP technology. Commercial applications such as hospitals, nursing homes, laundries, and hotels with large hot water needs are also well suited for CHP. Institutional applications such as colleges, schools, and residential and recreational facilities are excellent prospects for CHP.

This training course will highlight the following:

- Different types of CHP (Co-generation, Tri generation)
- Different technologies that are used in co-generation plants
- Sizing CHP power plants according to client needs
- Required calculations to estimate power outputs, plant efficiency, and energy saved

Course Objectives

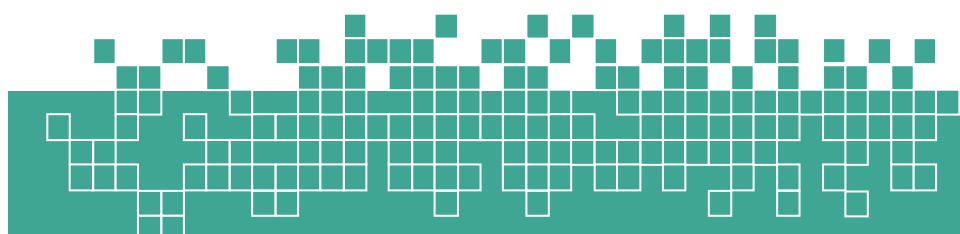
Familiarise course participants with

- Co-generation and waste heat utilisation concept
- Waste heat recovery potential
- Absorption chiller to produce chilled water
- Calculations to assess the power produced from waste heat
- System design and co-generation equipment selection

Why You Should Attend

Besides achieving the course objectives, the course is

- Flexible for busy people who want to advance their careers and gain new knowledge without disrupting their professional lives
- Course materials are updated continuously to reflect the latest trends in the industry
- Course material extracted from real-life case studies
- The course lecturer is an expert with hands-on experience in CHP plants.



At the End of the Course, You Will Be Able To

After finishing this course, the trainees will be able to:

- Identify client electrical and thermal needs
- Size suitable CHP plant to cover all or part of the Client's needs
- Select the right technology for the CHP plant
- Carry on the required calculations for the CHP plant
- Estimate recovered energy and energy savings

Who Should Attend?

This course is suitable for a wide range of professionals but will greatly benefit:

- Individuals who work /plan to work for energy services providers (ESCOs)
- professionals who plan to work/ plan to work in energy audits
- professionals working in places that can install co-generation systems
- Enthusiastic persons about decarbonisation technologies
- Persons who want to learn about the energy systems

Course lecturer

The lecturer's vast expertise in distributed power, co-generation, waste heat utilization, energy efficiency, and renewable energy is unparalleled. With multiple master's degrees under his belt, he brings an all-rounded approach to the subject, covering technical, policy, and economics aspects with ease.

Having worked with prestigious national and international organizations such as the EU, GIZ, MEDREG, RCREEE, UNIDO, and UNDP, the expert's track record is impressive. He has successfully undertaken numerous national and international projects, including energy audits, long-term energy planning, developing national renewable energy action plans (NREAPs) and national energy efficiency action plans (NEEAPs), and techno-economic assessments for hydrogen projects.

Apart from teaching at Cairo University, the lecturer's hands-on experience in the installation, operation, and maintenance of several co-generation plants is an added advantage. He has also designed co-generation plants and evaluated the financial feasibility of these projects. With such a wealth of knowledge and experience, the lecturer is undoubtedly the go-to expert in the field.

Course Syllabus

- Introduction to co-generation
- Advantages of co-generation technology
- Types of co-generation
- Internal combustion engine (ICE) technology
- Reading the ICE manufacturer's data
- Gas turbine (GT) technology
- Reading the GT manufacturer's data
- Waste heat boilers technology
- Absorption chillers technology
- Case study 1
- Case Study 2

Day 1: Introduction to CHP technology	
Session 1 (7:00 - 8.45)	• Introduction • Overview of CHP technologies • CHP efficiency compared to other alternatives
Session 2 (8:45 - 10:30)	• CHP technology, Internal Combustion Engine (ICE) • ICE advantages and disadvantages in CHP • Extracting data from Manufacturers' catalogues
Day 2: Applications	
Session 1 (7:00 - 8.45)	• CHP technology, Gas turbines (GT) • GT advantages and disadvantages in CHP • Extracting data from Manufacturers' catalogues
Session 2 (8:45 - 10:30)	• CHP technology, Waste Heat boilers (WHP) & exhaust heat exchangers (EHE) • WHP & EHE characteristics in CHP plants • Absorption Chillers • Absorption Chillers characteristics in CHP plants
Day 3: Design your first project	
Session 1 (7:00 - 8.45)	• Case study 1 • Assessing client needs • Extract data from catalogues • Doing calculations • Different possible configurations
Session 2 (8:45 - 10:30)	• Case study 2 • Assessing client needs • Extract data from catalogues • Doing calculations • Different possible configurations

Course mode: Interactive Online¹

Course duration: 10-11 hours

Course fees: USD 350

For any inquiries, please get in touch with info@energytics.net

¹ Face to Face course could be organised (kindly contact us for more details and fees)

