OFFICE OF CONSULTATION & TRAINING
College of Engineering and Petroleum

# Kuwait University- College of Engineering & Petroleum - Mechanical Engineering – OCT

# ME0021- Central Air Conditioning System Design

## Contact


24983474

24983523

24983524

tpd.occd@eng.ku.edu.kw


## Course objectives

Upon completion of this comprehensive training program, participants will be equipped with the skills to design, analyze, and manage central air conditioning systems, starting from understanding fundamental HVAC components and refrigeration principles, through performing detailed cooling load calculations and implementing effective zoning strategies using ASHRAE methods. They will learn to design comfortable and efficient air distribution systems by selecting appropriate outlets and ductwork, evaluate and select refrigerants based on performance and environmental impact (ODP, GWP), and apply rigorous commissioning and qualification protocols (DQ, IQ, OQ, PQ) to ensure system compliance and reliability. Furthermore, participants will be able to establish preventative maintenance routines to ensure longevity and optimal performance, while integrating energy-efficient practices and sustainability considerations throughout the entire system lifecycle.

**Training course duration:**

***Five Days***

**Timing:**

***8 a.m. - 2 p.m. Daily***

## Course outline :

## Day one topics:

Introduction to Air Conditioning:
- Definition and importance of air conditioning
- Historical background and development of air conditioning
- Basic principles of heat transfer and thermodynamics related to air conditioning

## Day two topics:

Air Conditioning Systems and Components:
- Overview of different types of air conditioning systems (e.g., split systems, packaged units, central cooling systems)
- Components of an air conditioning system (e.g., compressors, condensers, evaporators, expansion valves)
- Understanding the refrigeration cycle and its role in air conditioning

## Day three topics:

Psychometrics and Air Properties:
- Introduction to psychometrics and its relevance in air conditioning
- Properties of air, such as temperature, humidity, dew point, and enthalpy
- Psychrometric charts and their application in air conditioning calculations

## Day Four topics:

Load Calculations and Equipment Sizing:
- Estimating cooling loads for residential and commercial spaces
- Factors affecting load calculations (e.g., heat gain/loss, occupancy, equipment)
- Proper equipment sizing based on load calculations and system performance requirements

OFFICE OF CONSULTATION & TRAINING
College of Engineering and Petroleum

# Kuwait University- College of Engineering & Petroleum - Mechanical Engineering – OCT

# ME0021- Central Air Conditioning System Design

## Day Five topics:

Air Distribution Systems:
- Ductwork design and layout considerations
- Airflow calculations and duct sizing
- Balancing and adjusting air distribution for optimal comfort and efficiency

## Instructor:

Dr. Adel Alshayji
Mechanical Engineering
College of Engineering & petroleum
Kuwait University