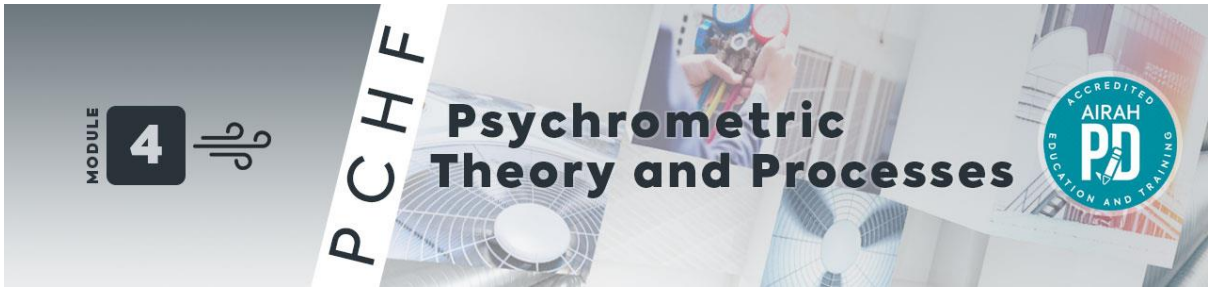

Module Outline

Welcome to the AIRAH 'Psychrometric Theory and Processes' module

In this course you will be introduced to the basics concepts of psychrometrics and human comfort and how psychrometrics is applied in the design and application of air conditioning systems.

The purpose of this course is to provide you with an awareness and knowledge of psychrometric theory sufficient to enable you to read and plot a psychrometric chart and apply the chart to a range of air conditioning processes.

This course covers the basics of the science of psychrometrics, specifically as it is applied to air conditioning processes and system design. A general knowledge of the technical terms and quantities used is provided in conjunction with explanation and analysis of the psychrometric chart.

The course also shows how the psychrometric chart can be used to show the correlation between various terms, and to make simple calculations for an air conditioning system.

The course tutorial provides you with the opportunity to use a psychrometric chart to depict the various processes involved in air conditioning and how to calculate the relevant quantities associated with those processes.

How to Work Through this Course:

You can navigate through the course content by using the navigational arrows in the course content or the table of contents in the side bar. You can return to the main menu at any time by using the link provided in the table of contents

Activities / Assessment overview etc

For every one of the Topics in this course, there is a self-assessment section. You need to complete this assessment (which may entail reading articles, visiting websites or referring to one of the reference texts), to demonstrate your knowledge and competency. There are multiple self-assessments methods used including:

- Multiple choice questions
- Drop and Drag to diagram
- Labelling diagrams and other images
- Performing calculations
- Matching statements with answers

Key Topics:

The key topics covered in this course are:

- Psychrometrics and human comfort
- Psychrometric theory – the psychrometric chart and the properties of moist air
- Air conditioning processes and factors
- Applied psychrometrics.

Learning outcomes

Following completion of this course and tutorial you should be able to:

- Define psychrometrics
- Identify the constituents of the atmosphere
- Identify the relationship of air conditioning to human comfort
- Identify the physical properties of moist air
- Describe Dalton's law of Partial Pressure
- Identify and define the variables represented on a psychrometric chart
- Construct a basic psychrometric chart
- Identify the properties of moist air on a psychrometric chart
- Identify the psychrometric processes that can be represented on a psychrometric chart
- Read a psychrometric chart
- Describe air conditioning processes
- Define air conditioning processes on a psychrometric chart
- Identify the factors relevant to satisfy room requirements
- Identify the quantity of air required in a conditioning apparatus to satisfy total air conditioning load
- Identify the condition of the supply air
- Describe effective surface temperature (t_{ES})
- Identify the Bypass Factor
- Define heat, moisture and enthalpy relationships
- Calculate and plot sensible, latent and total heat gains of air
- Apply the three main formulae for heat flow calculations
- Calculate the total, sensible and latent heat of an air conditioning process
- Determine mixed air conditions using psychrometric theory and charts
- Apply the mixed air theory to mixing of outdoor air and return air in air conditioning systems
- Calculate sensible heat ratio (SHR)
- Identify the relationship between room latent load and room sensible load
- Draw a full air conditioning system onto a psychrometric chart to include fan motor gains, mixing of outdoor air and return air, duct gains and input
- Calculate the total capacity for a typical air conditioning system.