BCM00 Introduction to Building Controls and HVAC
One day course
BCIA Members £305 + VAT
Non-members £385 + VAT

Overview
This introductory course is designed for those who do not require the full technical detail of the building controls courses (BCM01-BCM06), or who are new to this area of the industry. The course provides full coverage of day-to-day involvement in building controls and HVAC, but at a level that does not focus on the technical detail. The course is designed for facilities managers and estates managers, as well as electricians and other building services trades personnel who wish to become more informed in this sphere of work.

Objectives
The training programme will help delegates to understand:

- Why we need a control system
- Basic heating, ventilation and air conditioning equipment
- Basic heating, ventilation and air conditioning distribution and layouts
- Types of controls
- Structure and implementation of a Building Energy Management System (BEMS)

Course content

- What is a control system?
- Heating and hot water services
- Basic control of ventilation and air conditioning plant
- Fresh air and heating and cooling
- Effects of humidity and relative humidity
- Primary air plant
- Air re-treatment
- Cooling plant and systems – chillers, cooling towers and air cooled condensers
- The control loop
- Building Energy Management Systems
- End of course assessment

BCM01 Fundamentals of HVAC and Building Technology
Two day course
BCIA members £475 +VAT
Non-members £635 +VAT

Overview
This assessed course gives an overview of the systems and technologies used in the heating, ventilating and air conditioning industry. Building control and Building Energy Management Systems (BEMS) are also covered. This course is designed for those already involved in building controls that need to have a knowledge and understanding of the terminology, technologies and systems used, whether they are managers, designers or installation engineers.

Objectives
At the end of this course, delegates will understand:

- The physical fundamentals associated with buildings usage
- The most important requirements of the building enclosure and building services installation
- The principles of HVAC, and the psychrometric chart
- The functional principles of the most important HVAC systems and their main components
- The fundamentals of measurement and controls
- The purpose and basic variations of hydraulic circuits
- The basic refrigeration cycle

Course Content

- Introduction to building technology
- Physical principles
- Overview of heating systems
- Refrigeration technology
- Key components and distribution of hydraulics in building systems
- Introduction to ventilation and air conditioning
- Introduction to measuring and control technology
- End of course assessment

BCM02 Measuring & Control Technology
Two day course
BCIA members £475 +VAT
Non-members £635 +VAT

Overview
This course offers comprehensive training on the theory of measuring and control technology. Part one of the module focuses on the principles of measurement, potential variables and best practices for planning and evaluation of the technology. Part two focuses on the types of control technology used.

This course is designed for engineers and technicians who have some knowledge and field experience with a minimum period of one year within the industry. It is also recommended that candidates complete Fundamentals of HVAC & Building Technology (BCM01) first.

Objectives
At the end of this course, delegates will understand:

- The basics of measuring technology
- The structure and mode of operation of measuring principles used in HVAC
- The correct use and application of measuring equipment
- Ways to avoid measuring errors
- The comfort envelope
- Open and closed loop control
- Control states
- Reference variables
- Weather compensation

Course Content

- Fundamentals of measurement technology and principles of measurement
- Response
- Tolerance and measuring errors
- Measured variables in HVAC
- Placement and installation of sensors
- Measuring concept/measuring planning
- Introduction to control technology
- Controlled systems
- The different types of controllers and control loops
- Digital Direct Control (DDC)
- End of course assessment

BCM03 Hydraulics in Building Systems
Two day course
BCIA members £475 +VAT
Non-members £635 +VAT

Overview
Involving the main water circuits and systems used within the building services controls environment, this course includes the necessary mechanical knowledge needed to understand applications and covers all aspects of valve sizing and control. The course is designed for engineers and technicians who have some knowledge and a recommended minimum of one year field experience within the industry. It is also recommended that candidates complete Fundamentals of HVAC & Building Technology (BCM01) first.

Objectives
At the end of this course, delegates will understand:

- Hydraulic circuit types and applications
- The appropriate valves and actuators for a given hydraulic circuit
- How to identify hydraulic circuit problems
- Tools required for the correct sizing of valves and selection of actuators
- Troubleshooting

Course Content

- Introduction to hydraulic circuits
- Hydraulic characteristics of valves and actuators and sizing controlling elements
- Sizing of the control valves
- Types and application of valve actuators
- Hydraulic circuit problems
- Valve sizing exercise
- End of course assessment

BCM04 Control Function in Heating Plant
Two day course
BCIA members £475 +VAT
Non-members £635 +VAT

Overview
This course provides a detailed overview of all types of heating plants and systems together with the associated control applications and will help delegates to develop an intuitive understanding of heating applications. How to identify reason for different designs in heating plant and the impact of new technology is also covered. This is an advanced course for engineers and technicians who have a good level of knowledge and a recommended minimum of two years' experience within the industry. It is also recommended that candidates complete Fundamentals of HVAC & Building Technology (BCM01) first.

Objectives
At the end of this course, delegates will have advanced knowledge of:

- The structure and modes of operation of the most common control functions used in heating plant
- The functioning of typical plant
- The advantages and disadvantages of individual solutions
- Suitable control concepts

Course Content

- Control of a heating boiler and multiple boiler plants
- Control and supervision of oil/gas burners
- Control of heat output
- Control of hot water plant
- Energy efficient technologies
- Steam systems
- Introduction to Building Information Modelling (BIM)
- End of course assessment

BCM05 Control of Ventilation and Air Conditioning Plant
Two day course
BCIA members £475 +VAT
Non-members £635 +VAT

Overview
Using psychrometric charts and data, this course details the requirements of air conditioning plants and how they can be controlled effectively for resourceful operation and energy efficiency. This course is designed for managers, electricians and engineers who are responsible for the design, installation and commissioning of building control technologies and systems for ventilation and air conditioning. This advanced course builds on the knowledge gained in the BCM01-BCM04 courses.

Objectives
At the end of this course, delegates will have advanced knowledge of:

- The structure and modes of operation of the most common control functions used in ventilation and air conditioning plant
- The functioning of typical plant
- The advantages and disadvantages of individual solution variants
- Suitable control concepts

Course Content

- Air Handling Unit (AHU) component parts, design and selection
- Temperature control
- Humidity control
- Recirculating and air mixing
- Ice protection in heat recovery units
- Partial air conditioning plant
- Various control functions
- Control of air retreatment
- Principles and use of natural ventilation
- End of course assessment

BCM06 Control of Cooling Systems
Two day course
BCIA members £475 +VAT
Non-members £635 +VAT

Overview
A detailed, technical course relating to refrigeration and psychrometrics, focusing on how the refrigeration process operates, and the relationship with other parts of the cooling system. This is an advanced course for engineers and technicians who have a good level of knowledge and a recommended minimum of two years' experience within the industry. It is also recommended that candidates complete Fundamentals of HVAC & Building Technology (BCM01) first.

Objectives
At the end of this course, delegates will understand:

- Thermodynamics
- Refrigeration fundamentals
- The makeup of the h, log p chart
- The compression refrigeration cycle
- The functioning of heat pumps and ice storage plants
- The absorption process
- The different solution variants for refrigeration cycles
- Suitable control concepts

Course Content

- Fundamentals of thermodynamics
- Refrigerants
- Design of the compression refrigeration machine
- The h, log p chart diagram
- The absorption cycle – design, storage and modes
- Heat pump technology
- Variable Refrigerant Flow (VRF) technology
- Optimising chiller plant