

**HRODC Postgraduate Training Institute,**



***A Postgraduate-Only Institution,  
Verified by, & Registered with,  
UK's Department for Education.***

**#151**

**Heating, Ventilation, Air-  
Conditioning and  
Refrigeration (HVAC&R)  
Engineering,  
Postgraduate Programme.**

**Leading To:**

**Postgraduate Diploma in  
Heating, Ventilation, Air-  
Conditioning and  
Refrigeration (HVAC&R)  
Engineering.**

Postgraduate Diploma in HVAC&A; Page 1 of 52



**HRODC Postgraduate Training Institute, A Postgraduate-Only Institution  
HQ: 122A Bhylls Lane, Wolverhampton, WV3 8DZ, West Midlands, UK  
Primary Website = <https://www.hrodc.com>  
Prof. Dr. R. B. Crawford, Director.**

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**Prof. Dr. R. B. Crawford - Director**

PhD (UCL – Uni London); MEd M. (Uni Bath); PGC IS (Uni West London);  
Adv Dip Sc Ed (Uni Bristol); PG Dip Doctoral Research Supervision  
(Uni Wolverhampton); F.I.M.S.; HR Specialist (I.M.S.);  
Executive M. AOM; M. AAM; M. ISGS; M. SCOS; M. RG.

**Programme or Course Coordinator:**



Prof. Dr. R. B. Crawford, is the Director of  
HRODC Postgraduate Training Institute.

He has the following Qualifications and Affiliations:

- Doctor of Philosophy {(PhD) {University College London (UCL) - University of London}};
- MEd Management (University of Bath);
- Postgraduate (Advanced) Diploma Science Teacher Ed. (University of Bristol);
- Postgraduate Certificate in Information Systems (University of West London, formerly Thames Valley University);
- Diploma in Doctoral Research Supervision, (University of Wolverhampton);
- Teaching Certificate;
- Fellow of the Institute of Management Specialists;
- Human Resources Specialist, of the Institute of Management Specialists;
- Member of the Asian Academy of Management (MAAM);

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- Member of the International Society of Gesture Studies (MISGS);
- Member of the Standing Council for Organisational Symbolism (MSCOS);
- Member of ResearchGate;
- Executive Member of Academy of Management (AOM). There, his contribution incorporates the judging of competitions, review of journal articles, and guiding the development of conference papers. He also contributes to the Disciplines of:
  - Human Resources;
  - Organization and Management Theory;
  - Organization Development and Change;
  - Research Methods;
  - Conflict Management;
  - Organizational Behavior;
  - Management Consulting;
  - Gender & Diversity in Organizations; and
  - Critical Management Studies.

**Professor Dr. Crawford has been an Academic in the following UK Universities:**

- University of London (Royal Holloway), as Research Tutor;
- University of Greenwich (Business School), as Senior Lecturer (Associate Professor), in Organisational Behaviour and Human Resource Management;
- University of Wolverhampton, (Wolverhampton Business School), as Senior Lecturer (Associate Professor), in Organisational Behaviour and Human Resource Management;
- London Southbank University (Business School), as Lecturer and Unit Leader.

**His responsibilities in these roles included:**

- Doctoral Research Supervisor;
- Admissions Tutor;
- Postgraduate and Undergraduate Dissertation Supervisor;
- Programme Leader;
- Personal Tutor



## For Whom This Programme is Designed. This Programme is Designed For:

- HVAC Technicians;
- HVAC Consultants;
- HVAC Contractors;
- HVAC Designers;
- HVAC Service Supervisors;
- HVAC Assistants;
- HVAC Mechanics;
- HVAC Lecturers;
- Electrical Engineers;
- Mechanical Engineers;
- HVAC Maintenance and Operations Personnel;
- Project Managers;
- Project Engineers;
- Foremen;
- Master Electricians;
- Maintenance Technicians;
- Operation Managers;
- Others who want to gain better understanding of heating, ventilations and air-conditioning system design.

## Programme Duration & Cost:

- \* Classroom Duration: 12 Weeks; 5 Days Per Week;
- \* Online Duration: 20 Weeks; 3-Hr Day, 6-Day Week;
- \* Classroom Cost: £45,000.00 Per Student;
- \* Online Cost: £30,150.00 Per Student;
- \* Group Cost: Varies with its Size.



## Classroom-Based Cost Includes:

- Continuous snacks throughout the Event Days;
- Hot Lunch on Event Days;
- City Tour;
- Stationery;
- On-site Internet Access;
- Postgraduate Diploma; Postgraduate Certificate; Diploma – Postgraduate; or
- Certificate of Attendance and Participation – if unsuccessful on resit.

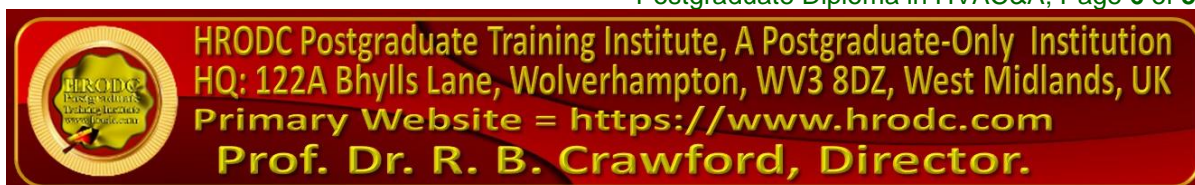
## Students & Delegates are Treated to a Selection of Our Branded Complimentary Products, which Include:

- Leather Conference Folder;
- Leather Conference Ring Binder/ Writing Pad;
- Key Ring/ Chain;
- Leather Conference (Computer – Phone) Bag – Black or Brown;
- 8-16 GB USB Flash Memory Drive, with Course Material;





- Branded Metal Pen;
- Branded Polo Shirt.; &
- Branded Carrier Bag.




**Heating, Ventilation,  
Air-Conditioning and  
Refrigeration (HVAC&R)  
Engineering, Programme.**


**Leading to:**

**Postgraduate Diploma in**

**Heating, Ventilation, Air-Conditioning and  
Refrigeration (HVAC&R) Engineering.**



<b>Heating, Ventilation, Air-Conditioning and Refrigeration (HVAC&amp;R) Engineering</b>				
<b>Leading to Postgraduate Diploma in Heating, Ventilation, Air-Conditioning and Refrigeration (HVAC&amp;R) Engineering</b>				
<b>Module Number</b>	<b>Pre-existing Course #</b>	<b>Module Title</b>	<b>Page #</b>	<b>Credit Value</b>
1	248	Heating, Ventilation and Air-Conditioning (HVAC): System Design and Value Engineering (1)	19	Double
2	126	Heating, Ventilation, Air-Conditioning and Refrigeration (HVAC&R): Equipment Installation, Diagnosis, Repairs, Maintenance and Troubleshooting	23	Quad
3		Heating, Ventilation and Air-Conditioning (HVAC): System Design and Value Engineering (2)	31	Single
4		Heating, Ventilation and Air-Conditioning (HVAC): Engineering Design, Procedures, and Air and Temperature Controls	34	Single
5		Heating, Ventilation and Air-Conditioning (HVAC): Engineering Design, Drawing, Specification, Thermodynamics, Psychodynamics, Sound, Vibration and Smoke Management	36	Double
6	035	Strategic Management and Project Management, For HVAC&R Settings	40	Double



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## Programme or Course Objectives

By the conclusion of the specified learning and development activities, delegates will be able to:

- Acquire knowledge about computer-based control;
- Acquire overall perspective of AHU systems arrangements;
- Advise others of the situations in which participant observation, conversation analysis, documentary analysis, focus groups, interviews & questionnaires, respectively, are appropriate;
- Analyse the threats that the organisation faces and how they might be circumvented;
- Analyse their organisation using PEST, PESTEL and LONGPEST factors into account.
- Apply the 'equity' theory to work situation from a 'differentiation perspective', rather than an 'equality perspective'.
- Apply the principles of Uninterruptible Power Supply (UPS);
- Apply the rule of thumb calculations;
- Ascertain how noise control is done;
- Ascertain the implementation of the heat balance method and radiant time series method;
- Assess the consequence to the organisation of its failure to meet the requirements of particular agencies; and
- Assess the organisation's strengths and weaknesses;
- Assess the value of secondary sources of information as a prelude to the conduct of primary research;
- Be familiar with the provisions of some codes, regulations and standards governing HVAC;
- Choose sources of information appropriate for the type of research being conducted;
- Choose the methodology that best suits the type of investigation being conducted & appropriate to the research objectives;



- Choose the most appropriate data elicitation techniques, in relation to the sampling frame, sampling unit, sample size & time span, among other factors;
- Cite some effects of altitude;
- Cite the different design considerations for acceptable IAQ;
- Cite the different design procedures for sensible heat transfer;
- Cite the different thermodynamic properties of moist air;
- Cite the effects of latitude and temperature;
- Cite the IAQ effects on health and comfort;
- Cite the options in system and equipment selection;
- Cite the step-by-step design procedure for zoned smoke control;
- Clearly explain the theoretical single-stage compression cycle;
- Conduct a motor-protector relay testing;
- Conduct an effective cost benefit analysis;
- Conduct an effective SWOT analysis, taking account of the political, economic, social, and technological factors into account; and
- Conduct field performance testing;
- Conduct implementation and performance testing;
- Conduct some acceptance and operational testing;
- Critically appraise existing motivation strategy within their organisations, identifying and addressing gaps;
- Define different terminologies in fluid mechanics;
- Define strategy;
- Demonstrate a high level of competency in designing cogeneration plants;
- Demonstrate a high level of knowledge of the atrium and mall smoke management design requirements;
- Demonstrate an awareness of the consequences of failure to meet the organisations external accountability;
- Demonstrate an overall understanding about the concept of the complete system;
- Demonstrate an understanding of an organisation or its subsystem's need to meet the expectations of the external environment;
- Demonstrate an understanding of the concept of motives and their value in organisational and subsystem effectiveness;

- Demonstrate an understanding of the concept of steam, water, pumps and high-temperature water in the fluid handling system;
- Demonstrate an understanding of the different HVAC equations;
- Demonstrate an understanding of the different levels and types of organisations and objectives;
- Demonstrate an understanding of the fundamental issues associated with organisational design and their implications for effective organisational functioning;
- Demonstrate an understanding of the fundamentals of electric power;
- Demonstrate an understanding of the general plant design concept;
- Demonstrate an understanding of the importance of delegation; and
- Demonstrate an understanding of the meaning of collegiality within a project management and general organisational setting;
- Demonstrate an understanding of the organisation, as an entity, as opposed to other groups;
- Demonstrate an understanding of the process of commissioning;
- Demonstrate an understanding of the system's approach to project management;
- Demonstrate an understanding on the protractor on the ASHRAE psychometric chart;
- Demonstrate familiarity with some thermodynamic terms;
- Demonstrate familiarity with the air duct design;
- Demonstrate familiarity with the air-and-water systems;
- Demonstrate familiarity with the boiler codes and standards;
- Demonstrate familiarity with the different types of motors;
- Demonstrate familiarity with the various aspects of building simulation;
- Demonstrate how popular motivation theories have contributed to our understanding of worker behaviour;
- Demonstrate how to control IAQ;
- Demonstrate knowledge about flow volume measurement;
- Demonstrate leadership in the implementation of change, whilst avoiding whilst avoiding Human and Organisational Casualties.
- Demonstrate proper safety practices and procedures while installing, diagnosing, repairing and troubleshooting and servicing HVAC/R systems;

- Demonstrate proper safety practices and procedures while testing, installing, troubleshooting and servicing HVACR systems;
- Demonstrate the competence in managing the delegation process effectively.
- Demonstrate their ability to apply thermodynamic principles in relation to HVAC&R;
- Demonstrate their ability to calculate the space heating load;
- Demonstrate their ability to design an appropriate organisational structure that takes account of contingent internal and external environmental factors.
- Demonstrate their ability to formulate a comprehensive motivation strategy;
- Demonstrate their ability to perform energy calculations;
- Demonstrate their ability to translate motivation theory into practice;
- Demonstrate their appreciation and understanding of how organisations, and particularly managers, might control, modify or re-engineer their work environment through a study of management/leadership styles, control systems, organisational development and learning.
- Demonstrate their appreciation of the need for a variance in intrinsic and extrinsic values if motivation;
- Demonstrate their awareness of change management and human resource implications;
- Demonstrate their competence in basic fan installation;
- Demonstrate their competence in interpreting and making conceptual design;
- Demonstrate their knowledge of testing the centrifugal switch in a single-phase motor;
- Demonstrate their skills in measuring the capacity of a capacitor;
- Demonstrate their understanding of different project methodologies, determining their benefits and pitfalls for particular types projects;
- Demonstrate their understanding of the importance of controlling the indoor climates in private homes, businesses, industrial plants, schools, medical buildings and government facilities.
- Demonstrate their understanding of the requirement of different external agents;
- Describe the duct design;
- Describe the latent heat moisture;
- Describe the process involve in system selection and arrangement;



- Describe the software-based equipment selection;
- Describe with accuracy the electrical interfaces;
- Design a research project that incorporates a high ethical standard.
- Design a research project, taking account of important issues;
- Design criteria and documentation forms;
- Design interviews & questionnaires that will elicit information appropriate to the research objectives;
- Design measures, which will ensure change institutionalisation; and
- Design questionnaires & interview schedules, with a mixture of open-ended & closed-ended questions, avoiding forced-choice in the latter;
- Design structured & unstructured questions, determining the conditions under which they should be used;
- Determine and develop a project life cycle;
- Determine effective fan performance and selection;
- Determine factors within their work environments that are stressors;
- Determine the activities and problems associated with each stage of the project life cycle;
- Determine the cost effectiveness of a project or a stage in its life cycle;
- Determine the different control symbols;
- Determine the different HVAC components and distribution systems;
- Determine the factors which cause company's failure.
- Determine the factors, which contribute to workers' resistance to change;
- Determine the functions of refrigerants;
- Determine the goals of ambient sound level design;
- Determine the interrelated functions of heating, cooling and air-conditioning;
- Determine the most appropriate methodology for individual situations.
- Determine the most appropriate methods of smoke control, relevant to particular situation.
- Determine the most effective ways of communicating change decisions to workers;
- Determine the opportunities that are available to the organisation and how it might best take advantage of it;
- Determine the situations when a particular approach might be appropriate;
- Determine the value of information in project methodology;

- Determine the various HVAC processes on the psychometric chart;
- Determine the ways in which an organisation might meet its varying accountability requirements.
- Determine ways of conserving energy through HVAC system design;
- Develop a clear understanding of the concept of heat gain, cooling load, and heat extraction rate;
- Develop a clear understanding on the general concepts of equipment selection;
- Develop a good lighting systems;
- Develop a heightened understanding in bridging the gap between energy efficiencies and IAQ requirement;
- Develop a sound strategic decision incorporating its three elements;
- Develop a strategy for maintaining their strengths while developing their weak areas;
- Develop an awareness for their own strengths and weaknesses;
- Devise a boiler design for specific scenario;
- Distinguish air flow in ducts and air flow in fittings;
- Distinguish between change strategies and approaches to change;
- Distinguish between direct- and indirect-fired heating equipment;
- Distinguish between low-temperature hot water central plants and high-temperature hot water central plants;
- Distinguish between radiant cooling and evaporative cooling;
- Distinguish between the different sets of motivation theories, notably content, process and reinforcement;
- Distinguish dynamic and static load calculations;
- Distinguish outdoor design conditions from indoor design conditions;
- Distinguish the first and second law of thermodynamics;
- Draw on the concept of 'equifinality' in managing the different project stages;
- Elucidate the Bernoulli equation;
- Elucidate the Bin Method Simulation Methods in energy calculations;
- Elucidate the number of transfer units (NTU) method;
- Elucidate the underlying principles of load calculations;
- Employ appropriate data analysis techniques, based on the type & volume of data available;

- Enumerate some ways of protecting outside air intakes;
- Enumerate the different characteristics of combined system and pump;
- Enumerate the different control strategies;
- Enumerate the different design conditions;
- Enumerate the different fuel options and alternative fuels;
- Enumerate the different heat transfer modes;
- Enumerate the different methods of specifying and measuring sound;
- Enumerate the different methods to control humidity and contaminants;
- Enumerate the different tools and equipment used for maintenance purposes and their corresponding functions;
- Enumerate the different types of maintenance and be able to apply them;
- Enumerate the factors for load components;
- Enumerate the secondary coolants;
- Enumerate the several refrigeration equipment components;
- Establish an effective planning mechanism that will facilitate effective project implementation;
- Establish the relationship between IAQ and energy conservation;
- Evaluate the appropriateness of the application of particular theoretical aspects of motivation to specific situations;
- Exhibit a heightened understanding on ventilation loads;
- Exhibit a high level of competency in designing central steam plants;
- Exhibit a high level of know the different participation during construction;
- Exhibit an understanding of the relationship between value engineering and HVAC system design;
- Exhibit their skills in designing an air-distribution system;
- Explain and conduct the step-by-step procedures in troubleshooting;
- Explain and describe the HVAC Cycles;
- Explain basic terms and concepts used in the HVAC&R industry including thermodynamics, temperature, heat, pressure, and latent and sensible heats;
- Explain how air conditions are characterized using the psychometric chart;
- Explain how refrigeration systems perform;
- Explain how the exhaust systems works;



- Explain how Thermal Radiation works in the making the space or open area comfortable to the occupants;
- Explain the application of cooling load calculation procedures;
- Explain the basic principle of fluid flow;
- Explain the common service voltages;
- Explain the concept of efficiency in relation to thermodynamics;
- Explain the concept of fluid mechanics, thermodynamics, heat transfer, psychometrics, and sound and vibration;
- Explain the concept of individual room AHUs;
- Explain the concept of power factor, using the appropriate examples;
- Explain the concept of strategic management and relate its contribution to the success of an organisation;
- Explain the concept of thermal conduction, convection and radiation;
- Explain the different HVAC theory and principles;
- Explain the drawings and specifications involve in the design process;
- Explain the Heat Balance Method;
- Explain the law of conservation of mass;
- Explain the log mean temperature deficiency (LMTD) method;
- Explain the most appropriate electrical room ventilation structure;
- Explain the Piping Systems;
- Explain the significance of HVAC System Maintenance;
- Explain the steps in regeneration cycles;
- Explain the typical control systems;
- Explain the underlying concept of refrigerants.
- Explicate the concept of standby power generation;
- Explicate the real single-stage cycle;
- Follow the common trends in the popular motivation theories;
- Follow the step-by-step procedure for service diagnosis;
- Follow the strategic management process in undertaking organisational strategy; and
- Formulate a workable motivation strategy;
- Formulate project objectives;
- Gain knowledge about air distribution with high flow rates;

- Get hold of the principle of zoned smoke management system;
- Give a thorough explanation on the application of thermal energy storage system in some selected industries;
- Give examples of zoned smoke management calculation;
- Highlight the fundamental concept of piping system;
- Highlight the methods used in diagnosing and repairing a variety of problems in HVAC components, tools and systems;
- Identify appropriate roles in research project management & produce realistic costing; and
- Identify the 3 levels of corporate approach;
- Identify the area covered by modern HVAC;
- Identify the basic concerns of IAQ;
- Identify the different cooling equipment;
- Identify the different heating equipment;
- Identify the different types of all-air systems;
- Identify the interrelationship between unit operation and maintenance;
- Identify the nature of contracts;
- Identify the parameters presented on a psychometric chart and plot basic heating and cooling process including calculating total heat (enthalpy) changes;
- Identify the several effects of altitude;
- Identify the step-by-step degree-day procedure;
- Identify the various moist air properties and conditioning processes;
- Identifying 'trends' & 'patterns' in information, in an effort to arrive at conclusions;
- Illustrate how the contingency approach to motivation might be applied to different situations;
- Illustrate how the elements of an HVAC system interact with other building systems to provide cool indoor air in an efficient and cost effective manner;
- Illustrate how to use the different energy calculation tools;
- Illustrate some behavior of jets;
- Illustrate the advantages and disadvantages of each strategy;
- Illustrate the advantages and drawbacks of group involvement in decisions related to change;
- Illustrate their knowledge of the common HVAC units and dimension;

- Incorporate the strategic approaches in the operation of the organisation;
- Indicate some of the preventive maintenance in HVAC system;
- Indicate the part that training and development play in worker motivation;
- Indicate the role of Indoor Air Quality as it provides health and comfort to the building occupants;
- Indicate their competence in the installation of Heating, Ventilation, Air Conditioning and Refrigeration (HVAC&R);
- Interpret psychometric charts;
- Interpret the psychometric chart;
- Learn how to conduct the three tests in assessing the effectiveness of the organisation and select which among them should be employed by the organisation;
- Learn how to reduce sound and vibration transmission;
- Learn some provision of National Electrical Code;
- Learn the basics of IAQ;
- Learn the concept of energy-efficiency compliance and indoor air quality compliance;
- Learn the concept of louvers, dampers and filters;
- Locate performance related pay, productivity bonuses and other remuneration inducement within existing motivation theory;
- Make a load calculation design using the computer;
- Make research proposals, taking pertinent factors into account;
- Manage latent and manifest resistance to change;
- Manage research projects, from inception to reporting;
- Manage the motivation process, taking account of the differences in preferences and expectation of workers;
- Manage the process of motivation, taking account of socio cultural and economic differences;
- Manage their interaction with colleagues and managers, in such a way that they get their desired results.
- Manage their time effectively, contributing to individual success and organisational improvement;



- Manage their workload in such a way that they reduce the negative effects of their associated stressor;
- Name some of the architectural, structural and electrical considerations;
- Name some of the basic heat-transfer modes;
- Name the types of heat exchangers;
- Observe the necessary precautions in doing smoke machine or smoke bomb testing.
- Organise and write a Report, with great clarity;
- Perform a test for a short circuit between run and start windings;
- Perform zoned smoke control systems test;
- Prepare letter reports;
- Produce effective reports, adhering to conventional styles, presenting evidence from the data, & exploiting visual representations;
- Prove their competence in maintaining HVAC components and system;
- Provide guidance on the use of a volt-ammeter for trouble shooting electric motors;
- Put forward their points without generating negative reaction from others; and
- Recognise the different variable speed drives;
- Recognize the underlying concept of heat pump systems and heat recovery systems;
- Relate the short history of HVAC;
- Show their ability to design flow, pump and piping system;
- Solicit evaluate and communicate information effectively for the enhancement of project decision making;
- Solve compressor problems;
- Solve problems encountered in HVAC process;
- Specify the different auxiliary heat sources;
- Specify the different control devices;
- Specify the different methods of providing acceptable IAQ;
- Specify the environmental criteria for typical buildings;
- Specify the necessary criteria for system and equipment selection;
- Specify the various HVAC sustainable design approaches;
- Specify the various terminal units;

- Suggest the efforts, which an organisation might employ to reduce workers' resistance to change;
- Suggest the most effective ways of engaging in designing operation and maintenance of HVAC;
- Test capacitors, effectively;
- Understand sound and vibration transmission;
- Understand the basic statements, codes, definitions and design guides for smoke management systems;
- Understand the concept of coefficient of performance;
- Understand the tables of properties;
- Uphold awareness of the five bases of coordination and determine which is appropriate for a particular situation;
- Use of Tables and Figures;
- Use SPSS and, or, Excel software packages in analysing data;
- View external accountability as the expectations of the organisation by different agencies;
- View project management in a holistic manner;
- Will determine the most effective control mechanism to employ in project management.

## Programme or Course Contents, Concepts, & Issues

# Module 1

## Heating, Ventilation and Air-Conditioning (HVAC): System Design and Value Engineering (1).

### M.1 Part 1: Salient Issues in Heating, Ventilation and Air-Conditioning (HVAC)

- Brief History of Heating, Ventilation and Air-Conditioning (HVAC);
- Scope of Modern Heating, Ventilation and Air-Conditioning (HVAC);

- Introduction to Air-conditioning Processes;
- System Capability;
- Engineering the Environment, for Human Comfort.

## **M.1 Part 2: Heating, Ventilation and Air-Conditioning (HVAC) System**

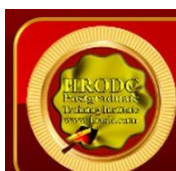
- The Psychometric Chart;
- General Air-Conditioning System;
- Zoned Air-Conditioning Systems;
- Choosing an Air-Conditioning System;
- System Choice Matrix.

## **M.1 Part 3: Thermal Comfort**

- Thermal Control, Defined;
- Factors Influencing Thermal Comfort;
- Conditions for Enhanced Comfort;
- System Management in Imperfect Environmental Conditions;
- Standard AC Requirements;
- European regulation for Air Conditioning: Pertinent Design Issues .

## **M.1 Part 4: Ventilation and Indoor Air Quality**

- Air Pollutants and Contaminants;
- Indoor Air Quality Effects on Health and Comfort;
- Controlling Indoor Air Quality;
- ASHRAE Standard 62 Ventilation for Acceptable Indoor Air Quality.





## M.1 Part 5: Zones

- Zone, Defined;
- Zone Elements;
- Key Zone Issues;
- Zone Specifications;
- Zone 'Compensation';
- Zoning Design;
- Controlling the Zone.

## M.1 Part 6: Single Zone Air Handlers and Unitary Equipment

- Buildings with Single-zone Package Air-Conditioning Units;
- Air-Handling Unit Components;
- Refrigeration Equipment;
- System Performance Requirements;
- Rooftop Units;
- Split Systems.

## M.1 Part 7: Multiple Zone Air Systems

- Single-Duct, Zoned Reheat, Constant Volume Systems;
- Single-Duct, Variable Air Volume Systems;
- By-Pass Box Systems;
- Constant Volume Dual-Duct, All-Air Systems;
- Multizone Systems;
- Three-deck Multizone Systems;
- Dual-Duct, Variable Air Volume Systems;
- Dual Path Outside Air Systems.



## M.1 Part 8: Hydronic Systems

- Natural Convection and Low Temperature Radiation Heating Systems;
- Panel Heating and Cooling;
- Fan Coils;
- Two Pipe Induction Systems;
- Water Source Heat Pumps.

## M.1 Part 9: Hydronic System Architecture

- Steam;
- Water Systems;
- Hot Water;
- Chilled Water;
- Condenser Water.

## M.1 Part 10: Central Plants

- Central Plant vs. Local Plant in a Building;
- Boilers;
- Chillers;
- Cooling Towers.

## M.1 Part 11: System Control

- Basic Control;
- Typical Control loops;
- Introduction to Direct Digital Control, DDC;
- Direct Digital Control of an Air-Handler;
- Architecture and Advantages of Direct Digital Controls.



## M.1 Part 12: Energy Conservation Measures

- Energy Considerations for Buildings;
- ASHRAE/IESNA Standard 90.1;
- Heat Recovery;
- Air-Side and Water-Side Economizers;
- Evaporative Cooling;
- Control of Building Pressure;
- The Final Step.

## M.1 Part 13: Special Applications of Heating, Ventilation and Air-Conditioning (HVAC) Engineering

- Radiant Heating and Cooling Systems;
- Thermal Storage Systems;
- The Ground as Heat Source and Sink;
- Occupant Controlled Windows with HVAC;
- Room Air Distribution Systems;
- Decoupled or Dual Path, and Dedicated Outdoor Air Systems.



## M.2 Part 1: Salient Issues in HVAC

- HVAC History;
- Scope of Modern HVAC;
- Common HVAC Units and Dimension;
- HVAC Theory and Principles;
- Basic Thermodynamic Principles;



- Introduction to Psychometric Chart.

## M.2 Part 2: Air-Conditioning Systems

- The Complete System;
- System Selection and Arrangement;
- HVAC Components and Distribution Systems;
- Types of All-Air Systems;
- Air-and-Water Systems;
- All-Water Systems;
- Decentralized Cooling and Heating;
- Heat Pump Systems;
- Heat Recovery Systems;
- Thermal Energy Storage.

## M.2 Part 3: Moist Air Properties and Conditioning Processes

- Moist Air and the Standard Atmosphere;
- Fundamental Parameters;
- Adiabatic Saturation;
- Wet Bulb Temperature and the Psychometric Chart;
- Classic Moist Air Processes;
- Space Air Conditioning-Design Conditions;
- Space Air Conditioning-Off-Design Conditions.

## M.2 Part 4: Comfort and Indoor Air Quality (IAQ)

- Comfort-Physiological Considerations;
- Environmental Comfort Indices;
- Comfort Conditions;
- The Basic Concerns of IAQ;
- Indoor Air Quality Effects on Health and Comfort;
- Controlling IAQ;

- ASHARE Standard - Ventilation for Comfortable IAQ;
- Common Contaminants;
- Methods to Control Humidity;
- Methods to Control Contaminants.

## **M.2 Part 5: Heat Transmission in Building Structures**

- Basic Heat-Transfer Modes;
- Tabulated Overall Heat-Transfer Coefficients;
- Moisture Transmission.

## **M.2 Part 6: Space Heating Load**

- Outdoor Design Conditions;
- Indoor Design Conditions;
- Transmission Heat Losses;
- Infiltration;
- Heat Losses from Air Ducts;
- Auxiliary Heat Sources;
- Intermittently Heated Structures;
- Supply Air For Space Heating;
- Source Media for Space Heating;
- Computer Calculation of Heating Loads.

## **M.2 Part 7: Solar Radiation**

- Thermal Radiation;
- The Earth's Motion About the Sun;
- Time;
- Solar Angles;
- Solar Irradiation;
- Heat Gain Through Fenestrations;
- Energy Calculations.

## M.2 Part 8: The Cooling Load

- Heat Gain, Cooling Load, and Heat Extraction Rate;
- Application of Cooling Load Calculation Procedures;
- Design Conditions;
- Internal Heat Gains;
- Overview of the Heat Balance Method;
- Transient Conduction Heat Transfer;
- Outside Surface Heat Balance-Opaque Surfaces;
- Fenestration-Transmitted Solar Radiation;
- Interior Surface Heat Balance-Opaque Surfaces;
- Surface Heat Balance-Transparent Surfaces;
- Zone Air Heat Balance;
- Implementation of the Heat Balance Method;
- Radiant Time Series Method;
- Implementation of the Radiant Time Series Method;
- Supply Air Quantities.

## M.2 Part 9: Energy Calculations and Building Simulation

- Degree-Day Procedure;
- Bin Method;
- Comprehensive Simulation Methods;
- Energy Calculation Tools;
- Other Aspects of Building Simulation.

## M.2 Part 10: Flow, Pumps, and Piping Design

- Fluid Flow Basics;
- Centrifugal Pumps;
- Combined System and Pump Characteristics;
- Piping System Fundamentals;





- System Design;
- Steam Heating Systems.

## **M.2 Part 11: Space Air Diffusion**

- Behavior of Jets;
- Air-Distribution System Design.

## **M.2 Part 12: Fans and Building Air Distribution**

- Fans;
- Fan Relations;
- Fan Performance and Selection;
- Fan Installation;
- Field Performance Testing;
- Fans and Variable-Air-Volume Systems;
- Air Flow in Ducts;
- Air Flow in Fittings;
- Accessories;
- Duct Design-General;
- Duct Design-Sizing.

## **M.2 Part 13: Direct Contact Heat and Mass Transfer**

- Combined Heat and Mass Transfer;
- Spray Chambers;
- Cooling Towers.

## M.2 Part 14: Extended Surface Heat Exchangers

- The Log Mean Temperature Deficiency (LMTD) Method;
- The Number of Transfer Units (NTU) Method;
- Heat Transfer–Single-Component Fluids;
- Transport Coefficients Inside Tubes;
- Transport Coefficients Outside Tubes and Compact Surfaces;
- Design Procedures for Sensible Heat Transfer;
- Combined Heat and Mass Transfer.

## M.2 Part 15: Refrigeration

- The Performance of Refrigeration Systems;
- The Theoretical Single-Stage Compression Cycle;
- Refrigerants;
- Refrigeration Equipment Components;
- The Real Single-Stage Cycle;
- Absorption Refrigeration;
- The Theoretical Absorption Refrigeration System;
- The Aqua–Ammonia Absorption System;
- The Lithium Bromide–Water System.

## M.2 Part 16: Tools and Equipment for Maintenance

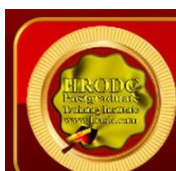
- Vacuum Pump and Charging Cylinder;
- Manifold Gauge and Brazing Equipment;
- Pinch-Off Tool Capable;
- Leak Detector and Tubing Cutter;
- Hand Tools to Remove Components;
- Digital Clamp-on Meter and Thermometer;
- Pliers and Clippers;
- Soldering Equipment;
- Air Velocity Measuring Instrument.

## M.2 Part 17: Inspection and Maintenance of HVAC Components and System

- Maintenance, Definition;
- Types of Maintenance;
- The Need for HVAC System Maintenance;
- Preventive Maintenance in HVAC System;
- What to do:
  - During Season?
  - When Season Begins?
  - During Off-Season
- Unit Operation and Maintenance.

## M.2 Part 18: Service Diagnosis and Repairs

- Pressure Drop External Equalizing;
- Suction Line Frosting;
- Distributor Refrigerant Control;
- Replacing a Thermostatic Expansion Valve;
- Replacing the Filter Drier;
- Low Side Purging;
- Moisture in the System;
- Compressor Efficiency Test;
- Removing Compressor Valve Plate Assembly;
- Removing a Compressor Rotary Shaft Seal;
- Excessive Operating Head Pressure;
- High Side Purging;
- Water Cooled Condensers;
- Compressor Motor Burn-Out;
- Pressure Controls;
- Motor Cycling Controls;
- System Faults;
- Noise;
- Simple Steps for Service Diagnosis.





## M.2 Part 19: Testing and Troubleshooting of HVAC Components

- Testing precaution;
- Compressor Problems;
- Capacitor testing;
- Measuring the capacity of a capacitor;
- Electric Motors;
- Motor-protector relay testing;
- Using a Volt-Ammeter for Trouble shooting Electric Motors;
- Testing the Centrifugal Switch in a Single-Phase Motor;
- Testing for a Short Circuit between Run and Start Windings;
- Troubleshooting Procedures.



## M.3 Part 1: HVAC Engineering Equations for Daily Use

- Frequently Used HVAC Equations:
  - Air Side Equations;
  - Fan Laws;
  - Heat Transfer Equations;
  - Fluid Handling;
  - Power and Energy;
  - Steam Equations.
- Infrequently used HVAC Equations:
  - Air Side Equations;
  - Fluid Handling;
  - Smoke Management.

### **M.3 Part 2: HVAC Engineering Fundamentals (1)**

- Problem Solving;
- Value Engineering;
- Codes, Regulations and Standards;
- Fluid Mechanics;
- Thermodynamics;
- Heat Transfer;
- Psychometrics;
- Sound and Vibration;
- Energy and Conservation.

### **M.3 Part 3: HVAC Engineering Fundamentals (2)**

- Comfort;
- HVAC Cycles;
- Control Strategies;
- Architectural, Structural and Electrical Considerations;
- Conceptual Design;
- Environmental Criteria for Typical Buildings;
- Designing for Operation and Maintenance;
- Codes and Standards.

### **M.3 Part 4: Equipment: Cooling**

- Regeneration Cycles;
- Compressors;
- Chillers;
- Condensers;
- Cooling Towers;
- Cooling Coils;
- Radiant Cooling;

- Evaporative Cooling;
- Refrigerants.


### **M.3 Part 5: Equipment: Heating**

- General;
- Boilers;
- Boiler Types;
- Combustion Processes and Fuels;
- Fuel-Burning Equipment;
- Boiler Feedwater and Water Treatment Systems;
- Boiler Codes and Standards;
- Boiler Design;
- Acceptance and Operational Testing;
- Direct- and Indirect-Fired Heating Equipment;
- Heat Exchangers – Water Heating;
- Heat Exchangers – Air Heating;
- Unit Heaters and Duct Heaters;
- Terminal Heating Equipment;
- Heat Pumps;
- Heat Recovery and Reclaim;
- Solar Heating;
- Humidification.

### **M.3 Part 6: Equipment: Air-Handling Systems**

- AHU Systems Arrangements;
- Package AHUs;
- Built-Up (Field-Assembled) AHU;
- Terminal Units;
- Individual Room AHUs;
- Humidity Control;
- Control of Outside Air Quantity;

- Effects of Altitude;
- Exhaust Systems;
- Smoke Control.



# Module 4

Heating, Ventilation and Air-Conditioning (HVAC):  
Engineering Design, Procedures, and Air and Temperature Controls.

## M.4 Part 1: Design Procedures: Load Calculations

- Use of Computers;
- Rule of Thumb Calculations;
- Design Criteria and Documentation Forms;
- Factors for Load Components;
- Load Calculations;
- Dynamic versus Static load Calculations;
- Ventilation Loads;
- Other Loads.

## M.4 Part 2: Design Procedures: General Concepts for Equipment Selection

- Sustainable System and Equipment;
- Maintainability of Systems and Equipment;
- Criteria for System and Equipment Selection;
- Options in System and Equipment Selection;
- The Psychometric Chart;
- Effects of Latitude and Temperature;
- Software-Based Equipment Selection.



### **M.4 Part 3: Design Procedures: Air Handling System**

- Fans;
- Air Duct Design;
- Registers and grilles;
- Louvers;
- Dampers;
- Filters;
- Air Distribution with High Flow Rates;
- Stratification;
- Noise Control;
- Indoor Air Quality.

### **M.4 Part 4: Design Procedures: Fluid Handling Systems**

- Steam;
- Water;
- High-Temperature Water;
- Secondary Coolants;
- Piping Systems;
- Pumps;
- Refrigerant Distribution.

### **M.4 Part 5: Design Procedures: Central Plants**

- General Plant Design Concept;
- Central Steam Plants;
- Low-Temperature Hot Water Central Plants;
- High-Temperature Hot Water Central Plants;
- Fuel Options and Alternative Fuels;
- Central Chilled Water Plants;

- Thermal Storage System;
- Central Plant Distribution Arrangements;
- Cogeneration Plants.

## M.4 Part 6: Design Procedures: Automatic Controls

- Control Fundamentals;
- Control Devices;
- Instrumentation;
- Typical Control Systems;
- Electrical Interfaces;
- Computer-Based Control;
- Control Symbols.



## M.5 Part 1: Electrical Features of HVAC Systems

- Fundamentals of Electric Power;
- Common Service Voltages;
- Power Factor;
- Motors;
- Variable Speed drives;
- Electrical Interface;
- Uninterruptible Power Supply (UPS);
- Standby Power Generation;
- Electrical Room Ventilation;
- Lighting Systems;
- National Electrical Code.

### **M.5 Part 2: Design, Documentations: Drawings and Specification**

- The Nature of Contracts;
- Drawings;
- Specifications.

### **M.5 Part 3: After Design: Through Construction to Operation**

- Participation during Construction;
- Commissioning.

### **M.5 Part 4: Technical Report Writing**

- Organization of a Report;
- Writing with Clarity;
- Use of Tables and Figures;
- Printing and Binding;
- Letter Reports.

### **M.5 Part 5: Engineering Fundamentals: Fluid Mechanics**

- Terminology in Fluid Mechanics;
- Law of Conservation of Mass;
- The Bernoulli Equation;
- Flow Volume Measurement.

## **M.5 Part 6: Engineering Fundamentals: Thermodynamics**

- Thermodynamic Terms;
- First law of Thermodynamics;
- Second law of Thermodynamics;
- Efficiency;
- Coefficient of Performance;
- Specific Heat C.

## **M.5 Part 7: Engineering Fundamentals: Heat Transfer**

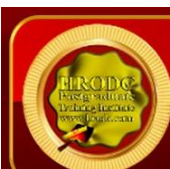
- Heat Transfer Modes;
- Thermal Conduction;
- Thermal Convection;
- Thermal Radiation;
- Latent Heat Moisture.

## **M.5 Part 8: Engineering Fundamentals: Psychometrics**

- Thermodynamic Properties of Moist Air;
- Tables of Properties;
- Psychometric Charts;
- HVAC Processes on the Psychometric Chart;
- The Protractor on the ASHRAE psychometric Chart;
- Effects of Altitude.

## **M.5 Part 9: Engineering Fundamentals: Sound and Vibration**

- Definitions;
- Methods of Specifying and Measuring Sound;
- Sound and Vibration Transmission;





- Ambient Sound Level Design Goals;
- Reducing Sound and Vibration Transmission.

## **M.5 Part 10: Engineering Fundamentals: Sound and Vibration**

- Basics of IAQ;
- Methods of Providing Acceptable IAQ;
- Design Considerations for Acceptable IAQ;
- Additional Design Considerations for Acceptable IAQ;
- Protection of Outside Air Intakes;
- IAQ and Energy Conservation.

## **M.5 Part 11: Sustainable HVAC Systems**

- Energy-Efficient “Green” Buildings;
- HVAC Sustainable Design Approaches;
- Energy-Efficiency Compliance;
- Indoor Air Quality Compliance;
- Bridging the Gap between Energy Efficiencies and IAQ Requirements.

## **M.5 Part 12: Smoke Management**

- Basic Statements, Codes, Definitions and Design Guides for Smoke Management Systems;
- Atrium and Mall Smoke Management Design Requirements;
- Zoned Smoke Management System;
- Design procedure for Zoned Smoke Control;
- Zoned Smoke Management Calculation Example;
- Implementation and Performance Testing;
- Testing of Zoned Smoke Control Systems;
- Note of Caution on Smoke Machine or Smoke Bomb Testing.



# Module 6

## Strategic Management and Project Management For HVAC&R Settings.

### M.6 Part 1: Strategic Management: An Overview

- Defining Strategy;
- Three Levels of Strategy;
- Basic Strategic Approaches;
- What Makes Strategy Effective?
  - The Value Added Test;
  - The Consistency Test;
  - The Competitive Advantage Test.
- Three Elements of Strategic Decision;
- What is Strategic Management?;
- The Strategic Management Process:
  - Mission;
  - Objectives;
  - External and Internal Analysis;
  - Strategic Choice;
  - Strategy Implementation;
  - Competitive Advantage.
- Why do Companies Fail?.

### M.6 Part 2: The Individual in a Dynamic Environment

- Individual Strengths and Weaknesses Analysis;
- Work Pressure as a 'Stressor';
- Dealing With Work Pressure;
- Time Management and 'Accounting Throughput';
- Pragmatic Assertiveness: Improving Your Ability To Question and Challenge.

### **M.6 Part 3: Organisational Analysis: An Internal View**

- Definition of Organisation;
- Organisational Objectives;
- The Collegium;
- Organisational Tasks;
- Division of Work/Labour;
- Delegation of Role, Task, Power, Authority in a Project Management and General Organisational Setting;
- Responsibility for Task Performance in an Organisation-Wide Context and Project Setting;
- Organisational Accountability: Internal and External;
- Internal Accountability: Worker Accountability to Team Managers and Project Leaders;
- Authority;
- Two Facets of Authority;
- The Second Facet of Authority;
- Traditional Authority;
- Legitimate Authority;
- Professional Authority;
- Power.

### **M.6 Part 4: Organisational Analysis: A Strategic View**

- External Organisational Accountability;
- Accountability to Owners/Sponsors;
- Accountability to Clients/Users/Customers;
- Accountability to Creditors;
- Accountability to Sector or Industry;
- Accountability to The State – Government, Generally; Regulatory Authorities (E.g. Office of Fair Trading, Competition Commission, Trading Standards, Sector Regulators, City Regulators.

## **M.6 Part 5: Internal and External Organisational Analysis: A Strategic View**

- Organisational Internal Analysis;
- Organisational Strengths and Weaknesses Analysis;
- Organisational External Analysis: Opportunities and Threats Analysis;
- Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis;
- External Global Analysis; Local, National, Global Analyses of PEST Factors or LONGPEST Analysis;
- Political, Economic, Social, Technological, European, Legal Analysis or PESTEL Analysis.

## **M.6 Part 6: Internal and External Organisational Analysis: A Strategic Vies**

### **Methods of Data Gathering**

- Questionnaire, Interview and Scalar Checklist Design;
- Information Gathering: Documentary Analysis, Conversation Analysis and Interviewing;
- Levels of Participant Observation;
- The Complete Participant As Observer: Making 'Detached Observations';
- Information Processing: Data Analysis and Interpretation.

### **Encouraging Lateral Thinking**

- Brainstorming;
- Forced Associations;
- Metaphors;
- Analogies.



## M.6 Part 7: Project Totality: A Systems View of Project Management

### Project Management Overview

- Defining a Project;
- Benefits of Project Management;
- What Project Management Helps You to Achieve?;
- Factors Determining Project Success;
- Project Constraints:
  - Scope;
  - Time;
  - Cost.
- Project Management Cost Estimating Tools;
- Project Cycle Management (PCM).

### Project Life Cycle

- Planning – Conceptualisation, Analysis, Proposal, Justification, Agreement;
- Doing – Start-Up, Execution, Completion, Hand Over;
- Checking – Review;
- Acting – Feedback;
- Development of a Project Life Cycle, Project Brief and Proposal;
- The Management of Change;
- The Systems Approach to Project Management;
- The Requirements of Successful Project Management;
- Balancing Costs and Benefits;
- Managing the Planning Process;
- Critical Incident Analysis;
- Project Control Mechanism;
- The Value Chain: Adding Value to Processes, Products and Processes;
- Project Decision-Making;
- Project Coordination: The 5 Bases of Co-Ordination;
- Developing A CATWOE Focus of Project Management;
- Why do Project Fails?.

## M.6 Part 8: Project Management: Approaches and Methodologies

- An Introduction to Structured Systems Analysis And Design Method ( SSADM);
- Feasibility Study;
- Project Definition and Profile;
- Deciding On Analytical and Project Approach;
- Analytical Toolkit;
- Project Methodologies – Iterative Through To Waterfall;
- Joint Application Design (JAD);
- Process Re-Engineering;
- RUP;
- Rapid Application Development (RAD);
- Process Mapping/Modelling;
- CASE;
- Facilitation/Workshop;
- Data Modelling;
- Strategy;
- Creativity Reviewing;
- The Bigger Picture;
- Objectivity;
- Testing Techniques;
- Prototyping;
- Cause and Effect Analysis;
- Root Cause Analysis.

## M.6 Part 9: Motivating Workers in a Project Setting


- Directing or Leading;
- The Concept of Motivation;
- Theories of Motivation;
- Equitable Reward Systems;
- Designing an Effective Motivation Strategy;
- The Collectivist vs. the Individualist Perspective of Motivation;
- Common Trends in Motivation Theories.

## **M.6 Part 10: Organisational Design: Structuring and Restructuring Organisations 1**


- An Introduction to Organisational Design: Approaches to Organisational Design - Classical, Neo-Classical and Contingency Approaches;
- Organisational Structure: Internal and External Relationships;
- Vertical and Horizontal Relationships;
- Lines of Authority and Accountability;
- The Functional Structure.

## **M.6 Part 11: Organisational Design: Structuring and Restructuring Organisations 2**

- The Divisional Structure and Its Internal Relationships;
- Basis of Divisionalisation;
- The Divisional Structure Compared With the Functional Structure On The Basis Of Communication, Co-Ordination, Autonomy, Control and Flexibility;
- The Organisation of The Matrix Structure Decision-Making and Communication Patterns In Functional, Divisional And Matrix Structures Compared.



**HRODC Postgraduate Training Institute.**  
**Regulation For The Awards of:**  
**\* Postgraduate Diploma;**  
**\* Postgraduate Certificate; &**  
**\* Diploma – Postgraduate.**



# Diploma – Postgraduate; PG Cert.; & Postgraduate Diploma Awards

Postgraduate Short Courses are of a minimum of five days' Classroom-Based (10 days' Video-Enhanced Online) but less than 6 weeks' Classroom-Based (less than 10 weeks' Video-Enhanced Online) duration, are referred to as Diploma – Postgraduate. This means that they are postgraduate credits, towards a Postgraduate Certificate and Postgraduate Diploma. Postgraduate Certificate and Postgraduate Diploma represent Programmes of Study, leading or accumulating to Awards bearing their title prefixes. While we, refer to our short studies, detailed above, as 'Courses', those with duration of 6 weeks or 12 weeks In-Classroom (10- and 20-weeks' Video-Enhanced Online) are labelled 'Programmes'. Nevertheless, we conform to popular usage, by often referring to all study durations as 'Courses'. A mark of distinction, though, is that participants in a short course are referred to as 'Delegates', as opposed to the ascription 'Students', which is confined to those studying a Postgraduate Programme.

In line with the above notion, a Postgraduate Certificate might be earned through a 6 weeks' Intensive Classroom-Based Study, or 10 weeks' Video-Enhanced, or Face-To-Face, Online Delivery. Similarly, a Postgraduate Diploma might be studied for 12 weeks In-classroom or 20 weeks Video-Enhanced Face-To-Face. They might also be taken through a blend of both modes, providing that a minimum of 6 and 12 Credits and 180 or 360 Credit-Hours, respectively, are earned. You might Pick and Mix Courses, to create your preferred blend of Disciplines, or follow a predesigned Specialist route. They might accumulate from our Postgraduate Short Courses, or through continuous study. [Please click to view and download our List of Specialist Postgraduate Certificate, and Postgraduate Diploma Programmes](#)





## Credit-Hours and Credit-Values, in Diploma – Postgraduate - Award

Credit-Hours are the actual amount of time that a lecturer or tutor spends with his or her students or delegates, in both Classroom-based and Video-Enhanced Deliveries. Each Five-Day Classroom-Based, or a Ten-Day Video-Enhanced (3 hours per day) Course consists of 30 Credit-Hours, while a 6-Day Classroom-based (12day Video-Enhanced) course amounts to 36 Credit-Hours. Because Credit-Values are calculated in multiples of 30 Credit-Hours, 60-89 Credit-Hours have a Double-Credit (2 Credit) value, while 90 Credit-Hours earn a Triple-Credit (3 Credits).

A delegate who successfully completes a Postgraduate Short Course of 30 or more Credit-Hours, but which is less than 180 Credit-Hours (Postgraduate Certificate), is awarded a Diploma – Postgraduate. This Award is assigned Credit-Values and Credit-Hours, as are exemplified by the following:

1. Diploma – Postgraduate – in Organisational Change Management, 30 Credit-Hours;
2. Diploma - Postgraduate - in Trainer Training: Training for Trainers, Double-Credit, 60 Credit-Hours:
3. Conveyancing and Property Valuation: Property Law, Double-Credit, 72 Credit-Hours:
4. Diploma – Postgraduate – in University and Higher Education Administration, Triple-Credit, 90 Credit-Hours;
5. Diploma – Postgraduate – in Tourism and International Relations, Quad-Credit, 120 Credit-Hours.

As in the first example, above, where the Credit-Value is not noted in an Award, it must be assumed that it is a Single-Credit Value.

## Postgraduate Diploma Award

A Postgraduate Diploma Award is achieved with a minimum of 360 Credit-Hours, through continuous study, or an accumulation of Credit-Hours.

## Postgraduate Certificate Award

A Postgraduate Certificate might be gained with a minimum of 180 Credit-Hours, through continuous study or Credit-Hours' accumulation.

## Cumulative Postgraduate Certificate, and Postgraduate Diploma Awards

All Postgraduate Short Courses accumulate to a Postgraduate Certificate and a Postgraduate Diploma, on a 'Pic and Mix' or Specialist basis. This means that we maintain academic records for each delegate, indicating the courses studied, with their Credit-Value and Credit-Hours, as are indicated above, '**Credit-Hours and Credit-Values, in Diploma – Postgraduate – Award**'. The Credit-Hours are aggregated to accumulate to at least 180 and 360 Credit-Hours, for a Postgraduate Certificate and a Postgraduate Diploma, respectively. Each Short Course Award (below a Postgraduate Certificate) indicates both its Credit-Value and Credit-Hours, excepting for Single-Credit.

## Accumulated Postgraduate Certificate, and Postgraduate Diploma Awards

All Specialist Postgraduate Certificate and Postgraduate Diploma Programmes have predetermined Award Titles. Delegates who do not follow a specialism, for accumulation to a Postgraduate Certificate and Postgraduate Diploma, receive a Generalist, rather than a Specialist, Award. However, a Specialist Award is given to delegates who

studied at least seventy percent (70%) of their courses in a specialist grouping, as are exemplified above, under the heading '**Postgraduate Diploma and Postgraduate Certificate Specialist Award Titles**'.

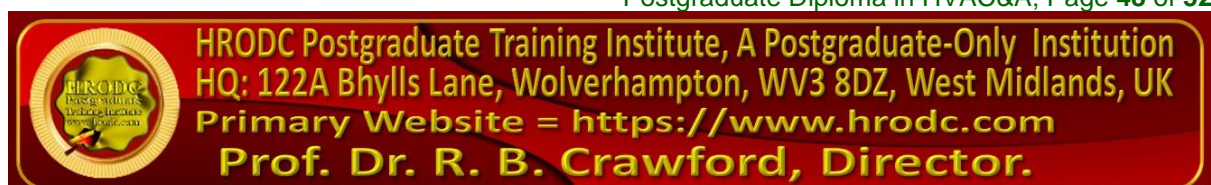


Applicants for Diploma – Postgraduate; Postgraduate Certificate; and Postgraduate Diploma are required to submit the following documents:

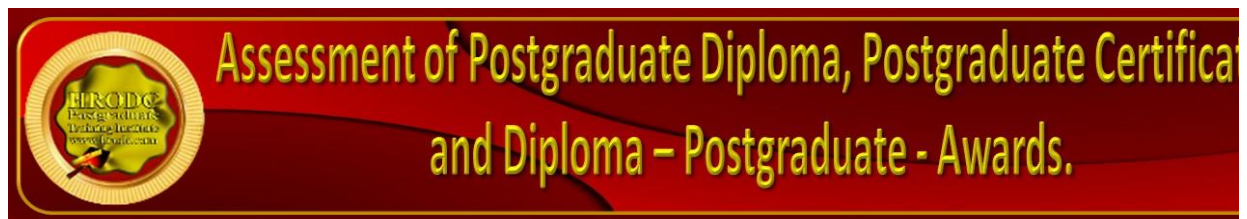
- Completed Postgraduate Application Form, including a passport sized picture affixed to the appropriate section;
- A copy of Issue and Photo (bio data) page/s of the applicant's current valid passport or copy of 'Photo-embedded' National Identity Card;
- Copies of credentials stated in the Application Form.

### Admission and Enrolment Procedure

- On receipt of all the above documents, they will be forwarded to our 'Admissions Committee', which will assess applicants' suitability for the Course or Programme for which they have applied;
- If they are accepted on their chosen Course or Programme, they will be notified accordingly, and sent Invoices;
- Upon receipt of an applicant's payment, we will send him or her an Official Payment Receipt, and Admission Letter, bearing a copy of the Passport-Type in the respective Application Form.
- Those intending to study in a foreign country, and require a Visa, will be sent the necessary **Immigration Documentation**, to support their application;
- **Joining Instruction** will be sent to Students and Delegates, on time to prepare for their enrolment. The incorporated information include:
  - Venue Name, Location, with specific address;
  - Details of Airport Transfer, where appropriate;



- Start date and time;
- Registration details;
- Daily Schedule;
- Local Transportation Details;
- Residential Accommodation Details;
- Leisure and Shopping Facilities, in the area;
- General Security Information; among others.



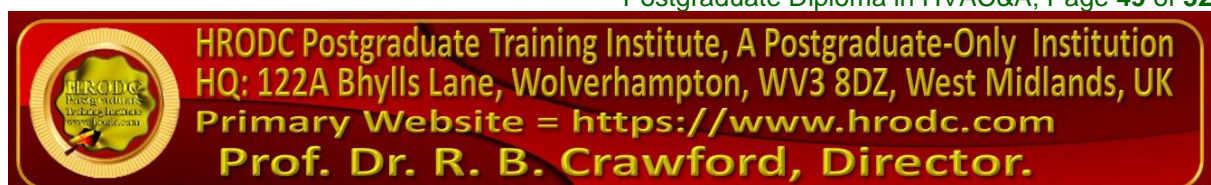
Because of the intensive nature of our Courses and Programmes, for In-Classroom, and Video-Enhanced Online modes, assessment will take place during or at the end of the **'active teaching period'**, adopting differing formats. These structures include, but are not limited to:

- In-Class Tests;
- Text-Case Analyses;
- Video-Case Analyses;
- 'Out-of-Class' Assignments;
- Individual Presentations;
- Group Presentations; and
- End of Course Examinations.

Based on these assessments, successful candidates will receive either a:

- Diploma – Postgraduate - Award;
- Postgraduate Certificate Award; or
- Postgraduate Diploma Award.

For all the above Awards, a minimum of 70% overall pass is expected. To receive the Awards of Postgraduate Certificate and Postgraduate Diploma, candidates must have accumulated at least





the required minimum 'Credit-Hours', with a pass (of 70% and above) in at least 70% of the courses taken.

Delegates and students who fail to achieve the requirement for Postgraduate Certificate, Postgraduate Diploma, or Diploma - Postgraduate - will be given support for 2 re-submissions for each course. Those delegates who fail to achieve the assessment requirement for the Postgraduate Diploma or Diploma - Postgraduate - on 2 resubmissions, or those who elect not to receive them, will be awarded the Certificate of Attendance and Participation.



In a move away from the traditional online courses and embracing recent developments in technology-mediated distance education, HRODC Postgraduate Training Institute has introduced a Video-Enhanced Online delivery. This Online mode of delivery is revolutionary and, at the time of writing, unique to HRODC Postgraduate Training Institute.

You are taught as individuals, on a one-to-one or one-to-small-group basis. You see the tutor face to-face, for the duration of your course. You will interact with the lecturer, ask, and address questions; sitting examinations, in his or her presence. It is as real as any face-to-face lecture and seminar can be. Choose from a wide range of Diploma – Postgraduate - Courses and an increasing number of Specialist Postgraduate Certificate and Postgraduate Diploma Programmes. You might also accumulate Postgraduate Short Courses, via this mode of study, over a 12-year period, towards a Postgraduate Certificate or Postgraduate Diploma.

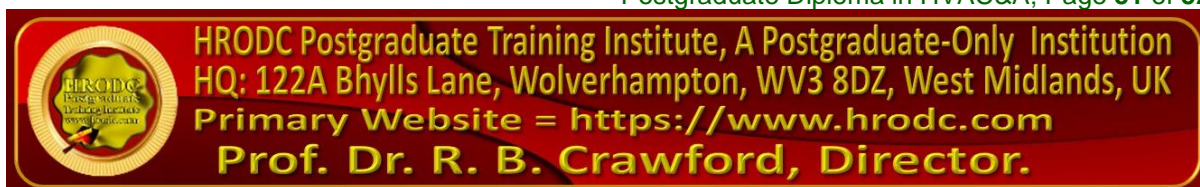
### Key Features of Our Online Study: Video-Enhanced Online

- The tutor meets the group and presents the course, via Video, in a similar way to its classroom-based counterpart;
- All participants can see, and interact with, each other, and with the tutor;
- They watch and discuss the various video cases and demonstrations that form an integral part of our delivery methodology;
- Their assessment is structured in the same way as it is done in a classroom setting;

- The Video-Enhanced Online mode of training usually starts on the 1<sup>st</sup> of each month, with the cut-off date being the 20<sup>th</sup> of each month, for inclusion the following month;
- Its duration is twice the duration of its classroom-based counterpart. For example, a 5-day (30 Credit Hours) classroom-based course will last 10 days, in Video-Enhanced Online mode. This calculation is based on 3 hours tuition per day, adhering to the Institute's required 30 Credit-Hours;
- The cost of the Video-Enhanced Online mode is 67% of similar classroom-based courses;
- For example, a 5-day classroom-based course, which costs Five Thousand Pounds, is only Three Thousand Three Hundred and Fifty Pounds (£3,350.00) in Video-Enhanced Online Mode.



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 **For and on Behalf of:**  
**Prof. Dr. R. B. Crawford - Director**  
**HRODC Postgraduate Training Institute**