

HRODC Postgraduate Training Institute



A Postgraduate - Only Institution



#126

Heating, Ventilation, Air-Conditioning and Refrigeration (HVAC&R): Equipment Installation, Diagnosis, Repairs, Maintenance and Troubleshooting

Postgraduate Short Course

Leading To:

DIPLOMA - POSTGRADUATE IN

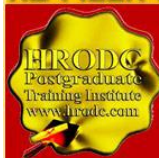
Heating, Ventilation, Air-Conditioning and Refrigeration Quad Credit, 120 Credit-Hours

Accumulating to A

Postgraduate Certificate, With 60 Additional Credit-Hours, or A

Postgraduate Diploma, With 240 Additional Credit-Hours

HRODC Postgraduate Training Institute
HQ : 122A Bhylls Lane, Castlecroft, Wolverhampton, West Midlands WV3 8DZ, UK



Prof. Dr. Ronald B. Crawford - Director

PhD (Uni London); M. Ed. M (Bristol); PGCIS (UWL); Adv. Dip. Sc. Ed (Bristol); Dip. Doc. Res. (Uni Wlv); F.I.M.S.; HR. S. (I.M.S.); Exec. M. AOM; M. AAM; M.I.S.G.S.; M.S.C.O.S.; M. RG. C.



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Websites:
<https://www.hrodc.com/>
<https://www.hrodc.london/postgraduatecourses.com/>

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WV3 8DZ
West Midlands, UK

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+44 7736 147 507

HRODC Postgraduate Training Institute, A Postgraduate-Only Institution


Our UK Government's Verification and Registration

Our Institute is Verified by, and Registered with, the United Kingdom (UK) Register of Learning Providers (UKRLP), of the Department for Education (DfE). Its UK Provider Reference Number (UKPRN) is: 10019585 and might be located at: <https://www.ukrlp.co.uk/>.

Course Coordinator:

Prof. Dr. R. B. Crawford is the Director of HRODC Postgraduate Training Institute, A Postgraduate-Only Institution. 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);



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- 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);
- 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;

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- Programme Leader;
- Personal Tutor

For Whom This Course is Designed

This Course is Designed For:

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

Classroom-Based Duration and Cost:	
Classroom-Based Duration:	20 Days
Classroom-Based Cost:	£20,000.00 Per Delegate
Online (Video-Enhanced) Duration and Cost	
Online Duration:	== Days – 3 Hours Per Day
Online Cost:	£====.00 Per Delegate



Classroom-Based Course and Programme Cost includes:

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

Students and Delegates will be given a Selection of our Complimentary Products, which include:

- **Our Branded Leather Conference Folder;**
- **Our Branded Leather Conference Ring Binder/ Writing Pad;**
- **Our Branded Key Ring/ Chain;**
- **Our Branded Leather Conference (Computer – Phone) Bag – Black or Brown;**
- **Our Branded 8-16 GB USB Flash Memory Drive, with Course Material;**
- **Our Branded Metal Pen;**
- **Our Branded Polo Shirt.;**
- **Our Branded Carrier Bag.**

Daily Schedule: 9:30 to 4:30 pm.

Delivery Locations:

1. **Central London, UK;**
2. **Dubai, UAE;**
3. **Kuala Lumpur, Malaysia;**
4. **Amsterdam, The Netherlands;**
5. **Brussels, Belgium;**
6. **Paris, France; and**
7. **Durban, South Africa;**
8. **Other International Locations, on request.**

Course Programme for Heating, Ventilation, Air-Conditioning and Refrigeration (HVAC&R): Equipment Installation, Diagnosis, Repairs, Maintenance and Troubleshooting Course

Leading to Diploma – Postgraduate – in Heating, Ventilation, Air-Conditioning and Refrigeration (Quad Credit) and 120 Credit-Hours, Accumulating to a Postgraduate Certificate, with 60 Additional Credit-Hours, or a Postgraduate Diploma, with 240 Additional Credit-Hours

Course Objectives

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

- Ascertain the implementation of the heat balance method and radiant time series method;
- Be able to solve compressor problems;
- Be familiarize with the various aspects of building simulation;
- Become familiarize with the air-and-water systems;
- Cite the different design procedures for sensible heat transfer;
- Cite the IAQ effects on health and comfort;
- Clearly explain the theoretical single-stage compression cycle;
- Conduct a motor-protector relay testing;
- Conduct field performance testing;
- Demonstrate how to control IAQ;
- 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 their ability to apply thermodynamic principles in relation to HVAC&R;
- Demonstrate their ability to calculate the space heating load;
- Demonstrate their skills in measuring the capacity of a capacitor;

- Describe the duct design;
- Describe the process involve in system selection and arrangement;
- Determine effective fan performance and selection;
- Determine the different HVAC components and distribution systems;
- Determine the interrelated functions of heating, cooling and air-conditioning;
- Develop a clear understanding of the concept of heat gain, cooling load, and heat extraction rate;
- Distinguish air flow in ducts and air flow in fittings;
- Distinguish outdoor design conditions from indoor design conditions;
- Elucidate the Bin Method Simulation Methods in energy calculations;
- Elucidate the number of transfer units (NTU) method;
- Enumerate the different characteristics of combined system and pump;
- Enumerate the different design conditions;
- 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 several refrigeration equipment components;
- Exhibit their skills in designing an air-distribution system;
- Explain and conduct the step-by-step procedures in troubleshooting;
- 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 psychrometric chart;
- Explain how refrigeration systems perform;
- 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 different HVAC theory and principles;
- Explain the Heat Balance Method;
- Explain the log mean temperature deficiency (LMTD) method;
- Explain the significance of HVAC System Maintenance;

- Explicate the real single-stage cycle;
- Follow the step-by-step procedure for service diagnosis;
- Demonstrate their competence in basic fan installation;
- Highlight the methods used in diagnosing and repairing a variety of problems in HVAC components, tools and systems;
- Prove their competence in maintaining HVAC components and system;
- Test capacitors, effectively;
- Demonstrate an overall understanding about the concept of the complete system;
- Give thorough explanation on the application of thermal energy storage system in some selected industries;
- Identify the area covered by modern HVAC;
- Identify the basic concerns of IAQ;
- Identify the different types of all-air systems;
- Identify the interrelationship between unit operation and maintenance;
- Identify the parameters presented on a psychometric chart and plot basic heating and cooling process including calculating total heat (enthalpy) changes;
- Identify the step-by-step degree-day procedure;
- Identify the various moist air properties and conditioning processes;
- Illustrate some behavior of jets;
- Demonstrate their knowledge of testing the centrifugal switch in a single-phase motor;
- Provide guidance on the use of a volt-ammeter for trouble shooting electric motors;
- Indicate some of the preventive maintenance in HVAC system;
- Illustrate their knowledge of the common HVAC units and dimension;
- Highlight the fundamental concept of piping system;
- 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 ability to perform energy calculations;
- Illustrate how to use the different energy calculation tools;
- Name some of the basic heat-transfer modes;

- Indicate their competence in the installation of Heating, Ventilation, Air Conditioning and Refrigeration (HVAC&R);
- Perform a test for a short circuit between run and start windings;
- 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;
- Specify the different auxiliary heat sources;
- 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;
- Explain the underlying concept of refrigerants.

Course Contents, Concepts and Issues

Part 1: Introduction

- HVAC History;
- Scope of Modern HVAC;
- Common HVAC Units and Dimension;
- HVAC Theory and Principles;
- Basic Thermodynamic Principles;
- Introduction to Psychometric Chart.

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.

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.

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.

Part 5: Heat Transmission in Building Structures

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

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.

Part 7: Solar Radiation

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

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.

Part 9: Energy Calculations and Building Simulation

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

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.

Part 11: Space Air Diffusion

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

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.

Part 13: Direct Contact Heat and Mass Transfer

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

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.

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.

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.

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.

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.

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;

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- Testing the Centrifugal Switch in a Single-Phase Motor;
- Testing for a Short Circuit between Run and Start Windings;
- Troubleshooting Procedures.

Postgraduate Diploma, Postgraduate Certificate, and Diploma – Postgraduate - Short Course Regulation

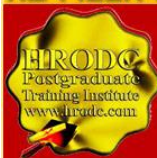
Postgraduate Certificate, Postgraduate Diploma, and Diploma – Postgraduate: Their Distinction, Credit Value and Award Title

Postgraduate Short Courses of a minimum of five days' 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 to Awards bearing their title prefixes. While we, refer to our short studies, of 5 days to five weeks, as 'Courses', those with duration of 6 weeks and more are labelled 'Programmes'. Nevertheless, in line with popular usage, we often refer to all study durations as 'Courses'. Another mark of distinction, in this regard, is that participants in a short course are referred to as 'Delegates', as opposed to the term 'Students', which is confined to those studying a Postgraduate Programme.

Courses are of varying Credit-Values; some being Single-Credit, Double-Credit, Triple-Credit, Quad-Credit, 5-Credit, etc. These short courses accumulate to Postgraduate Certificate, with a total of 180 Credit-Hours (= 6 X 5-Day Courses or 3 X 10-Day Courses), or Postgraduate Diploma, with a total of 360 Credit-Hours (= 12 X 5-Day Courses or 6 X 10-Day Courses).

Delegates studying courses of 5-7 days' duration, equivalent to 30-42 Credit-Hours (Direct Lecturer Contact), will, on successful assessment, receive the Diploma – Postgraduate Award. This represents a single credit at Postgraduate Level. While 6-day and 7-day courses also lead to a Diploma – Postgraduate, they accumulate 36 and 42 Credit Hours, respectively.

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Postgraduate Certificate, Postgraduate Diploma, and Diploma – Postgraduate Assessment Requirement

Because of the intensive nature of our courses and programmes, assessment will largely be in-course, adopting differing formats. These assessment formats include, but not limited to, in-class tests, assignments, end of course examinations. Based on these assessments, successful candidates will receive the Diploma – Postgraduate, Postgraduate Certificate, or Postgraduate Diploma, as appropriate.

In the case of Diploma – Postgraduate, a minimum of 70% overall pass is expected. In order 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.

Diploma – Postgraduate, Postgraduate Certificate, and Postgraduate Diploma Application Requirements

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 form;
- A copy of Issue and Photo (bio data) page of the applicant's current valid passport or copy of his or her Photo-embedded National Identity Card;
- Copies of credentials mentioned in the application form.

Admission and Enrolment Procedure

- On receipt of all the above documents we 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 Admission Letters and Invoices;
- One week after the receipt of an applicant's payment or official payment notification, the relevant Course or Programme Tutor will contact him or her, by e-mail or telephone, welcoming him or her to HRODC Postgraduate Training Institute;
- Those intending to study in a foreign country, and require a Visa, will be sent the necessary immigration documentation, to support their application;
- Applicants will be notified of the dates, location and venue of enrolment and orientation, where appropriate.

Modes of Study and Duration of Postgraduate Certificate and Postgraduate Diploma Programmes

There are two delivery formats for Postgraduate Certificate and Postgraduate Diploma Programmes, as follows:

1. Intensive Full-time (Classroom-Based) Mode, lasting 3 months for Postgraduate Diploma, and 6 weeks for Postgraduate Certificate. These durations are based on six hours' lecturer-contact per day, five days (30 hours) per week, for Postgraduate Diploma;
2. Video-Enhanced On-Line Mode. This interactive online mode lasts twenty (20) weeks, for Postgraduate Diploma, and ten (10) weeks for Postgraduate Certificate. Our calculation is based on three hours per day, six days per week.

Whichever study mode is selected, the aggregate of 360 Credit Hours must be achieved.

Introducing Our Video-Enhanced Online Study Mode

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 tutor, ask and address questions; sit examinations in the presence of the tutor. 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 6-year period, towards a Postgraduate Certificate or Postgraduate Diploma.

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

- The tutor meets the group and presents the course, via Video, in a similar way to its classroom-based counterpart;
- All participants are able to 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 1st of each month, with the cut-off date being the 20th of each month, for inclusion the following month;
- Its duration is twice as long as 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;

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- 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.

10-Week Video-Enhanced Online Postgraduate Certificate and 20-Week Video-Enhanced Online Postgraduate Diploma

You might study an Online Postgraduate Certificate or Online Postgraduate Diploma, in 10 and 20 weeks, respectively, in the comfort of your office or homes, through HRODC Postgraduate Training Institute's Video-Enhanced Online Delivery. We will deliver the 180 Credit-Hours and 360 Credit-Hours, in line with our regulation, through 'Direct-Lecturer-Contact', within the stipulated timeframe. We aim to fit the tuition around your work, family commitment and leisure, thereby enhancing your maintenance of an effective 'work-study-life-style balance', at times convenient to you and your appointed tutor.

Cumulative Postgraduate Certificate and Postgraduate Diploma Courses

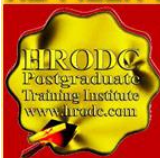
All short courses can accumulate to the required number of Credit-Hours, for the Postgraduate Certificate and Postgraduate Diploma, over a six-year period from first registration and applies to both general and specialist groupings. In this regard, it is important to note that short courses vary in length, the minimum being 5 days (Diploma – Postgraduate) – equivalent to 30 Credit Hours, representing one credit, as is tabulated below.

On this basis, the definitive calculation on the Award requirement is based on the number of hours studied (aggregate credit-value), rather than merely the number of credits achieved. This approach is particularly useful when a student or delegate studies a mixture of courses of different credit-values.

For those delegates choosing the accumulative route, it is advisable that at least one or two credits be attempted each year. This will ensure that the required 180 Credit-Hours and 360 Credit-Hours, for the Postgraduate Certificate and Postgraduate Diploma, respectively, are

Heating, Ventilation, Air-Conditioning and Refrigeration (HVAC &R) - Page 21 of 25

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achieved, within the designated period. These Credit-Values, awards and their accumulation are exemplified below.

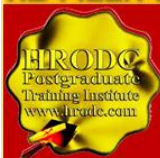
Examples of Postgraduate Course Credits: Their Value, Award Prefix & Suffix – Based on 5-Day Multiples		
Credit Value	Credit Hours	Award Title Prefix (& Suffix)
Single-Credit	30-54	Diploma - Postgraduate
Double-Credit	60-84	Diploma – Postgraduate (Double-Credit)
Triple-Credit	90-114	Diploma – Postgraduate (Triple-Credit)
Quad-Credit	120-144	Diploma – Postgraduate (Quad-Credit)
5-Credit	150-174	Diploma – Postgraduate (5-Credit)
6-Credit	180-204	Postgraduate Certificate
7-Credit	210-234	Postgraduate Certificate (+ 1 Credit)
8-Credit	240-264	Postgraduate Certificate (+2 Credits)
9-Credit	270-294	Postgraduate Certificate (+3 Credits)
10-Credit	300-324	Postgraduate Certificate (+ 4 Credits)
11-Credit	330-354	Postgraduate Certificate (+5 Credits)
12-Credit	360	Postgraduate Diploma
360 Credit-Hours = Postgraduate Diploma		
12 X 5-Day Courses = 360 Credit-Hours = Postgraduate Diploma		
10 X 6-Day Courses = 360 Credit-Hours = Postgraduate Diploma		

Exemplification of Accumulated Postgraduate Certificate and Postgraduate Diploma Award Titles

All Specialist Postgraduate Certificate and Postgraduate Diploma Programmes have their predetermined Award Titles. Where delegates do not follow a Specialism, for accumulation to a Postgraduate Diploma, they will normally be Awarded a General Award, without any Specialist Award Title. However, a Specialist Award will be given, where a delegate studies

Heating, Ventilation, Air-Conditioning and Refrigeration (HVAC &R) - Page 22 of 25

HRODC Postgraduate Training Institute
HQ : 122A Bhylls Lane, Castlecroft, Wolverhampton, West Midlands WV3 8DZ, UK



Prof. Dr. Ronald B. Crawford - Director

PhD (Uni London); M. Ed. M (Bristol); PGCIS (UWL); Adv. Dip. Sc. Ed (Bristol); Dip. Doc. Res. (Uni Wlv); F.I.M.S.; HR. S. (I.M.S.); Exec. M. AOM; M. AAM; M.I.S.G.S.; M.S.C.O.S.; M. RG. C.

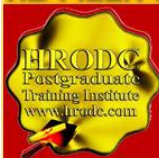
Heating, Ventilation, Air-Conditioning and Refrigeration (HVAC &R), Leading to Diploma Postgraduate - in Heating, Ventilation, Air-Conditioning and Refrigeration (Quad Credit), and 120 Credit-Hours, Accumulating to A Postgraduate Certificate, with 60 Additional Credit-Hours, a Postgraduate Diploma, with -240 Additional Credit-Hours

at least seventy percent (70%) of his or her courses in a specialist grouping. These are exemplified below:

1. **Postgraduate Diploma in Accounting and Finance;**
2. **Postgraduate Certificate in Accounting and Finance;**
3. **Postgraduate Certificate in Aviation Management;**
4. **Postgraduate Diploma in Aviation Management;**
5. **Postgraduate Certificate in Industrial Health and Safety Management, Incorporating Oil and Gas Safety;**
6. **Postgraduate Diploma in Industrial Health and Safety Management, Incorporating Oil and Gas Safety;**
7. **Postgraduate Certificate in Business Communication;**
8. **Postgraduate Diploma in Business Communication;**
9. **Postgraduate Certificate in Corporate Governance;**
10. **Postgraduate Diploma in Corporate Governance;**
11. **Postgraduate Certificate in Costing and Budgeting;**
12. **Postgraduate Diploma in Costing and Budgeting;**
13. **Postgraduate Certificate in Client or Customer Relations;**
14. **Postgraduate Diploma in Client or Customer Relations;**
15. **Postgraduate Certificate in Engineering and Technical Skills;**
16. **Postgraduate Diploma in Engineering and Technical Skills;**
17. **Postgraduate Certificate in Events Management;**
18. **Postgraduate Diploma in Events Management;**
19. **Postgraduate Certificate in Health and Safety Management;**
20. **Postgraduate Diploma in Health and Safety Management;**
21. **Postgraduate Certificate in Health Care Management;**
22. **Postgraduate Diploma in Health Care Management;**
23. **Postgraduate Certificate in Human Resource Development;**
24. **Postgraduate Diploma in Human Resource Development;**
25. **Postgraduate Certificate in Human Resource Management;**
26. **Postgraduate Diploma in Human Resource Management;**

Heating, Ventilation, Air-Conditioning and Refrigeration (HVAC &R) - Page 23 of 25

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M. RG. C.

- 27. Postgraduate Certificate in Information and Communications Technology (ICT);**
- 28. Postgraduate Diploma in Information and Communications Technology (ICT);**
- 29. Postgraduate Certificate in Leadership Skills;**
- 30. Postgraduate Diploma in Leadership Skills;**
- 31. Postgraduate Certificate in Law – International and National;**
- 32. Postgraduate Diploma in Law – International and National;**
- 33. Postgraduate Certificate in Logistics and Supply Chain Management;**
- 34. Postgraduate Diploma in Logistics and Supply Chain Management;**
- 35. Postgraduate Certificate in Management Skills;**
- 36. Postgraduate Diploma in Management Skills;**
- 37. Postgraduate Certificate in Maritime Studies;**
- 38. Postgraduate Diploma in Maritime Studies;**
- 39. Postgraduate Certificate in Oil and Gas Operation;**
- 40. Postgraduate Diploma in Oil and Gas Operation;**
- 41. Postgraduate Certificate in Oil and Gas Accounting;**
- 42. Postgraduate Diploma in Oil and Gas Accounting;**
- 43. Postgraduate Certificate in Politics and Economic Development;**
- 44. Postgraduate Diploma in Politics and Economic Development;**
- 45. Postgraduate Certificate in Procurement Management;**
- 46. Postgraduate Diploma in Procurement Management;**
- 47. Postgraduate Certificate in Project Management;**
- 48. Postgraduate Diploma in Project Management;**
- 49. Postgraduate Certificate in Public Administration;**
- 50. Postgraduate Diploma in Public Administration;**
- 51. Postgraduate Certificate in Quality Management;**
- 52. Postgraduate Diploma in Quality Management;**
- 53. Postgraduate Certificate in Real Estate Management;**
- 54. Postgraduate Diploma in Real Estate Management;**

Heating, Ventilation, Air-Conditioning and Refrigeration (HVAC &R), Leading to Diploma Postgraduate - in Heating, Ventilation, Air-Conditioning and Refrigeration (Quad Credit), and 120 Credit-Hours, Accumulating to A Postgraduate Certificate, with 60 Additional Credit-Hours, a Postgraduate Diploma, with -240 Additional Credit-Hours

55. Postgraduate Certificate n Research Methods;

56. Postgraduate Diploma in Research Methods;

57. Postgraduate Certificate in Risk Management;

58. Postgraduate Diploma in Risk Management;

59. Postgraduate Certificate in Sales and Marketing;

60. Postgraduate Diploma in Sales and Marketing;

61. Postgraduate Certificate in Travel, Tourism and International Relations;

62. Postgraduate Diploma in Travel, Tourism and International Relations.

The actual courses studied will be detailed in a student or delegate's Transcript.

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Director

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