

# HRODC Postgraduate Training Institute



**# 141.2**

**Advanced Engineering Drawing and Design Part 2**

**Course or Seminar**

**Leading To:**

**DIPLOMA - POSTGRADUATE IN  
Advanced Engineering Drawing and Design  
Part 2 (Double Credit)**

**Accumulating to**

**POSTGRADUATE DIPLOMA**

**Progressing To**

**A Masters Degree –**

**MBA – MSc – MA**

P. 1

A Division of HRODC Ltd. UK Reg. No. 6088763. V.A.T. Reg. No. 8958 765 38


**Prof. Dr. R. B. Crawford - Director HRODC Postgraduate Training Institute**

PhD (London), MEd.M. (Bath), Adv. Dip. Ed. (Bristol), PGCIS (TVU), ITC (UWI), MAAM, MAOM, LESAN, MSCOS, MISGS, Visiting Prof. P.U.P.

Registered with the UK Register of Learning Providers (UKRLP), Department for Business, Innovation and Skills (BIS), formerly Department of Innovation, Universities and Skills (DIUS).



UKLP Registration No: 10019585  
UKLP Verification: <http://www.ukrlp.co.uk>  
Postgraduate Full-Time and Short Courses  
London, UK & International Locations

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<b>HRODC Postgraduate Training Institute</b>		

## Advanced Engineering Drawing and Design Part 2

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#### Accumulating to

### POSTGRADUATE DIPLOMA

#### Progressing To

## A Masters Degree – MBA – MSc – MA

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## HRODC Postgraduate Training Institute - UKRLP Registration



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Its Registration Number is 10019585  
and can be verified at <http://www.ukrlp.co.uk/>

### Course Co-ordinator:

**Prof. Dr. R. B. Crawford – Director HRODC Postgraduate Training Institute**

- ✚ PhD (London),
- ✚ MEd. M. (Bath),
- ✚ Adv. Dip. Ed. (Bristol),
- ✚ PGCIS (TVU),
- ✚ ITC (UWI),
- ✚ MSCOS
- ✚ Member of the Asian Academy of Management - MAAM,
- ✚ Member of the International Society of Gesture Studies - MISGS
- ✚ Member of the Academy of Management - MAOM,
- ✚ LESAN,
- ✚ Visiting Professor Polytechnic University of the Philippines – PUP

### For Whom This Course is Designed

#### This Course is Designed For:

- ✚ Civil Engineers
- ✚ Mechanical Engineers
- ✚ Electrical Engineers
- ✚ Design Engineers
- ✚ Computer Engineers
- ✚ Architects
- ✚ Engineering Professors
- ✚ Drafting Professionals
- ✚ Fine Arts Graduates

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**Duration: 2 Weeks (10 Days)**

**Cost:**

- ✓ **£8,000.00 + VAT (Government Tax) Per Delegate for UK Delivery**
- ✓ **£10,000.00 + VAT (Government Tax) Per Delegate for non-UK European Delivery**
- ✓ **£10,000.00 Per Delegate for Non-European Delivery (No VAT - Government Tax)**

**Cost includes:**

- ✓ Continuous refreshments,
- ✓ Hot Lunch,
- ✓ Stationery,
- ✓ Course Guide and Supplement,
- ✓ HRODC Postgraduate training Institute's Diploma – Postgraduate - or
- ✓ Certificate of Attendance and Participation

**Course runs from 9:30 to 4:30 pm.**

**Location: Central London and International Locations**

**Schedule - Part 3:**

[http://www.hrodc.com/Course Schedule Part 3 Oil Tanker Operations STCW Trade Promotion KSFs KPIs Public Sector Reforms HVAC HVAC and R Value Engineering Courses.htm](http://www.hrodc.com/Course%20Schedule%20Part%203%20Oil%20Tanker%20Operations%20STCW%20Trade%20Promotion%20KSFs%20KPIs%20Public%20Sector%20Reforms%20HVAC%20HVAC%20and%20R%20Value%20Engineering%20Courses.htm)

**Click to book this course:**

[http://www.hrodc.com/Course Booking Form London Dubai Kuala Lumpur Paris Johann sburg Cairo Jeddah Abu Dhabi Kuwait MBA MSc MA Course.htm](http://www.hrodc.com/Course%20Booking%20Form%20London%20Dubai%20Kuala%20Lumpur%20Paris%20Johann%20sburg%20Cairo%20Jeddah%20Abu%20Dhabi%20Kuwait%20MBA%20MSc%20MA%20Course.htm)

## Course Programme for Advanced Engineering Drawing and Design Part 2

### Leading to Diploma – Postgraduate in Advanced Engineering and Drawing Design Part 2 (Double Credit)

#### Fasteners and Springs

- ❖ The Engineering Design Application
- ❖ Screw Thread Fasteners
- ❖ Thread-Cutting Tools
- ❖ Thread Forms
- ❖ Thread Representations
- ❖ Thread Notes
- ❖ Measuring Screw Threads
- ❖ CADD Applications: Drawing Fasteners
- ❖ Threaded Fasteners
- ❖ Washers
- ❖ Dowel Pins
- ❖ Taper and Other Pins
- ❖ Retaining Rings
- ❖ Keys, Keyways and Keyseats
- ❖ Rivets
- ❖ Springs
- ❖ CADD Applications: Drawing Springs

#### Sections, Revolutions and Conventional Breaks

- ❖ The Engineering Design Application
- ❖ Sectioning
- ❖ Cutting-Plane Lines
- ❖ Section Lines
- ❖ Full Sections
- ❖ Half Sections

- ❖ Offset Sections
- ❖ Aligned Sections
- ❖ Unsectioned Features
- ❖ CADD Applications: Sectioning
- ❖ Intersections in Section
- ❖ Conventional Revolutions
- ❖ Broken-Out Sections
- ❖ Auxiliary Sections
- ❖ Conventional Breaks
- ❖ Revolved Sections
- ❖ Removed Sections

## Geometric Tolerancing

- ❖ The Engineering Design Application
- ❖ General Tolerancing
- ❖ Symbology
- ❖ Datum Feature Symbols
- ❖ Datum Reference Frame
- ❖ Datum Features
- ❖ Datum Target Symbols
- ❖ Datum Axis
- ❖ Feature Control Frame
- ❖ Basic Dimensions
- ❖ Geometric Tolerances
- ❖ Material Condition Symbols
- ❖ CADD Applications: Geometric Tolerancing
- ❖ Location Tolerance
- ❖ Datum Precedence and Material Condition
- ❖ Position of Multiple Features
- ❖ Composite Positional Tolerancing
- ❖ Two Single-Segment Feature Control Frames

- ❖ Positional Tolerance of Tabs
- ❖ Positional Tolerance of Slotted Holes
- ❖ Positional Tolerance of Threaded Features And Gears
- ❖ Positional Tolerance of Counterbored Holes
- ❖ Positional Tolerance of Coaxial Holes
- ❖ Positional Tolerancing of Nonparallel Holes
- ❖ Projected Tolerance Zone
- ❖ CADD Applications: Geometric Tolerancing Symbols
- ❖ Geometric Dimensioning and Tolerancing with AutoCADD
- ❖ Virtual Condition
- ❖ Statistical Tolerancing with Geometric Controls
- ❖ Combination Controls

### **Mechanisms: Linkages, Cams, Gears and Bearings**

- ❖ The Engineering Design Application
- ❖ CADD Applications: Mechanism Design
- ❖ Mechanisms
- ❖ Linkages
- ❖ Linkage Symbols
- ❖ Types of Linkages
- ❖ CADD Applications: Cams and Gears
- ❖ Cams
- ❖ Cam Displacement Diagrams
- ❖ Construction of an In-Line Follower Plate Cam Profile
- ❖ Construction of an Offset Follower Plate Cam Profile
- ❖ Drum Can Drawing
- ❖ Gears
- ❖ CADD Applications: Cam Displacement Diagrams and Profiles: Cam Manufacturing
- ❖ Gear Structure
- ❖ Splines
- ❖ Gear Types



- ❖ Spur Gear Design
- ❖ Gear Accuracy
- ❖ Drawing Specifications and Tolerances
- ❖ Designing and Drawing Spur Gears
- ❖ CADD Applications: Gear Teeth
- ❖ Designing Spur Gear Trains
- ❖ Designing and Drawing the Rack And Pinion
- ❖ Designing and Drawing Bevel Gears
- ❖ Plastic Gears
- ❖ Bearings
- ❖ Drawing Bearing Symbols
- ❖ Bearing Codes
- ❖ CADD Applications: Bearing Symbols
- ❖ Bearing Selection
- ❖ Gear and Bearing Assemblies

## Belt and Chain Drives

- ❖ The Engineering Design Application
- ❖ Advantages of Gear Drives
- ❖ Advantages of Belt Drives
- ❖ Advantages of Chain Drives
- ❖ Belts and Belt Drives
- ❖ Typical Belt Drive Arrangements
- ❖ Belt Drive Selection
- ❖ Chain Drives
- ❖ Chain Drive Sprockets
- ❖ Chain Classification and Types
- ❖ Precision Chains
- ❖ CADD Applications: Sprockets
- ❖ Nonprecision Chains
- ❖ Light-Duty Chain



- ❖ Chain Drive Arrangements
- ❖ Roller Chain Drive Selection

## Working Drawings

- ❖ The Engineering Design Application
- ❖ Detail Drawings
- ❖ Assembly Drawings
- ❖ Types of Assembly Drawings
- ❖ CADD Applications: Working Drawings
- ❖ Identification Numbers
- ❖ Parts Lists
- ❖ Purchase Parts
- ❖ Engineering Changes
- ❖ Drawing Form a Prototype
- ❖ Analysis of a Set of Working Drawings

## Pictorial Drawings and Technical Illustrations

- ❖ The Engineering Design Application
- ❖ Pictorial Drawings
- ❖ Isometric Projections and Drawings
- ❖ Types of Isometric Drawings
- ❖ Isometric Construction Techniques
- ❖ Diametric Pictorial Representation
- ❖ Trimetric Pictorial Representation
- ❖ CADD Applications: 3-D Capabilities
- ❖ Exploded Pictorial Drawing
- ❖ Oblique Drawing
- ❖ Perspective Drawing
- ❖ One-Point Perspective
- ❖ Two-Point Perspective
- ❖ Three-Point Perspective

- ❖ Circles and Curves in Perspective
- ❖ Basic Shading Techniques
- ❖ Layout Techniques

### **Solid Modeling, Animation and Virtual Reality**

- ❖ The Engineering Design Application
- ❖ Type of 3-D CAD Models
- ❖ Modeling Kernel
- ❖ Parametric Modeling and the Design Process
- ❖ Working With Parts, Assemblies and Features
- ❖ Built-In Features
- ❖ Editing Feature History
- ❖ Animation
- ❖ Virtual Reality

### **Welding Processes and Representations**

- ❖ The Engineering Design Application
- ❖ Welding Tests
- ❖ CADD Applications: Welding Symbols And Applications
- ❖ Welding Specifications
- ❖ Prequalified Welded Joints
- ❖ Weld Design

### **Industrial Process Piping**

- ❖ The Engineering Design Application
- ❖ Where is Industrial Piping Used?
- ❖ What is Piping Drafting?
- ❖ Types of Pipe
- ❖ CADD Applications: Piping
- ❖ Pipe Connection Methods

- ❖ Fittings
- ❖ CADD Applications: Three-Dimensional System Models
- ❖ Flanges
- ❖ Valves
- ❖ Pipe Drafting
- ❖ Piping Details
- ❖ CADD Applications: 3-D Digitizing
- ❖ Layout Techniques

## Structural Drafting

- ❖ The Engineering Design Application
- ❖ Line Work
- ❖ Lettering
- ❖ Coordination of Working Drawings
- ❖ Structural Drafting Related to Construction Systems
- ❖ Concrete Block Construction
- ❖ Wood Construction
- ❖ Steel Construction
- ❖ Common Connection Methods
- ❖ Components in a Set of Structural Drawings
- ❖ CADD Applications: Structural Drafting
- ❖ Drawing Revisions
- ❖ Basic Drawing Layout Steps
- ❖ Pictorial Drawings



## Synopsis of Diploma – Postgraduate, Postgraduate Diploma and Postgraduate Degree Regulation

### Postgraduate Diploma and Diploma – Postgraduate: Their Distinction and Assessment Requirement

Courses of 5 days duration (30 hour direct lecturer contact) but less than 3 months (360 hours direct lecturer contact), will, on successful assessment, lead to the Diploma – Postgraduate. This means a single credit at Postgraduate Level. While a 6-day and 7-day course also lead to a Diploma – Postgraduate, they accumulate 36 hours and 42 hours, respectively. Delegates and students who fail to gain the required level of pass, at Postgraduate Level will receive a Certificate of Attendance and Participation. The Certificate of Attendance and Participation will not count, for cumulative purpose, towards the Postgraduate Diploma.

Courses carry varying credit values; some being double credit, triple credit, quad credit and 5-credit, etc. These, therefore, accumulate to a Postgraduate Diploma. As is explained, later, in this document, a Postgraduate Diploma is awarded to students and delegates who have achieved the minimum of 360 hours direct tutor contact, within the required level of attainment.

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, or Postgraduate Diploma, as appropriate.

In the case of Diploma – Postgraduate, a minimum of 70% overall pass is expected. In order to receive the Award of Postgraduate Diploma, candidate 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 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 Diploma and Postgraduate Degree Application Requirements

Applicants for Diploma – Postgraduate, Postgraduate Diploma and Postgraduate Degrees 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 make an assessment of the applicants' suitability for the Programme for which they have applied;
- ✓ If they are accepted on their Programme of choice, 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 Programme Tutor will contact him or her, by e-mail or telephone, welcoming him or her to HRODC Postgraduate Training Institute;
- ✓ Non-European Students will be sent immigration documentation, incorporating a Visa Support Letter. This letter will bear the applicant's photograph and passport details;
- ✓ Applicants will be notified of the dates, location and venue of enrolment and orientation;
- ✓ Non-UK students will be sent general information about 'student life' in the UK and Accommodation details.

## Modes of Study for Postgraduate Diploma Courses

There are three delivery formats for Postgraduate Diploma Courses, as follows:

1. Intensive Full-time Mode (3 months);
2. Full-time Mode (6 month);
3. Video-Enhanced On-Line Mode.

Whichever study mode is selected, the aggregate of 360 hours direct lecturer contact must be achieved.

## Cumulative Postgraduate Diploma Courses

All short courses can accumulate to the required number of hours, for the Postgraduate Diploma, over a six-year period from the 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 hours direct lecturer contact, representing one credit. Twelve 5-day short courses, representing twelve credits or the equivalent of 360 hours of lectures are, therefore, required for the Award of Postgraduate Diploma.

A six-day course (Diploma – Postgraduate) is, therefore, equivalent to 36 hours direct lecturer contact, representing one credit. Therefore, ten short courses, of this duration, equates to the required 360 hours of lectures, qualifying for the Award of Postgraduate Diploma. While double-credit courses last between ten and fourteen days, triple-credit courses range from fifteen to nineteen days. Similarly, quad-credit courses are from sixteen to nineteen days. 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 two credits be attempted per year. This will ensure that the required number of credit hours for the Postgraduate diploma is achieved within the six-year time frame.



## Progression to Postgraduate Degree – MA, MBA, MSc

- ✓ On the successful completion of the *Postgraduate Diploma*, delegates may register for the Masters Degree, after their successful completion of Course #7: *Research Project: Design, Conduct & Report*.
- ✓ The Delegates' Degree Registration Category will be dictated by the courses or modules studied at Postgraduate Diploma Level. The categories relate to Master of Business Administration (MBA); Master of Arts (MA) Master of Science (MSc); Executive Master of Business Administration (Executive MBA). Additional details are provided below.

## Terms and Conditions

HRODC Policy Terms and Conditions are Available for viewing at:

<http://www.hrodc.com/COSTS.htm>

Or Downloaded, at:

[http://www.hrodc.com/Brochure\\_Download\\_Centre.Company\\_Brochures\\_Seminar\\_Brochures\\_Seminar\\_Schedule.htm](http://www.hrodc.com/Brochure_Download_Centre.Company_Brochures_Seminar_Brochures_Seminar_Schedule.htm)

The submission of our application form or otherwise registration by of the submission of a course booking form or e-mail booking request is an attestation of the candidate's subscription to our Policy Terms and Conditions, which are legally binding.

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