

#221

Rotating Equipment Design, Testing, and Maintenance: Bearings, Seals, Pumps, Lubrication Systems, Compressors, Hydraulics, and Turbines, Postgraduate Course.

Leading To:

Diploma - Postgraduate - in

Rotating Equipment: Design, Testing, and Maintenance, Quad-Credit, 120 Credit-Hours.

Accumulating to a Postgraduate Certificate, with 60 additional Credit-Hours, and a Postgraduate Diploma, with 240 additional Credit-Hours.

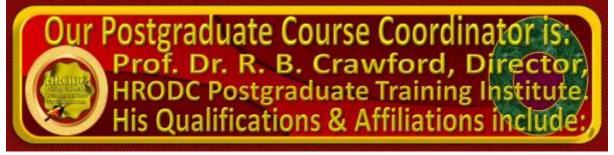
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- Doctor of Philosophy {(PhD) {University College London (UCL) University of London)};
- MEd Management (University of Bath);
- Postgraduate (Advanced) Diploma Science Teacher Ed. (University of Bristol);
- Postgraduate Certificate in Information Systems (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);
- 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.

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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.

He was formerly an Expatriate at:

- Ministry of Education, Sokoto, Nigeria;
- Ministry of Science and Technical Education, Sokoto, Nigeria;
- University of Sokoto, Nigeria;
- College of Education, Sokoto, Nigeria; and

Former Editor-In-Chief of 'Sokoto Journal of Education'.





- Rotating Equipment Engineers;
- Drilling Engineers;
- Maintenance Engineers;
- Reliability Engineers;
- Well Engineers;
- Rig Engineers;
- Workover Engineers;
- Petroleum Oil and Gas Engineers;
- Petroleum Oil and Gas Journeymen;
- Petroleum Oil and Gas Production Engineers;
- Petroleum Oil and Gas Mechanical Engineers;
- Supervisors and managers responsible for the availability of critical rotating machinery assets;
- Those involved in the design and manufacture of rotating machinery who wish to enhance their understanding of rotating machinery behaviour;
- Anyone who works with mechanical and rotating equipment at industrial plants, utilities or commercial and private building facilities.









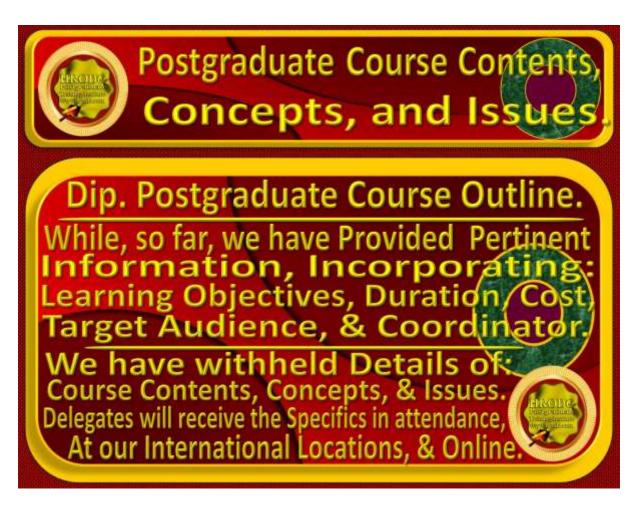






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Part | **Principles** of Rotating Equipment: Contextualisation; Types; General; Design and Construction; Installation **Commissioning**; Performance **Monitoring** Maintenance; Failure Modes and Analysis; Safety and **Conditions**; **Technologies** New Innovations; Balancing and Alignment; Lubrication Systems; Vibration Analysis; etc.

Part 2. Principles of Rotating Equipment: Contextualisation; Types; General; Design and Construction; Installation and Commissioning; Performance Monitoring and Maintenance; Failure Modes and Analysis; Safety and Process Conditions; New Technologies and Innovations; Balancing and Alignment; Lubrication Systems; Vibration Analysis; etc. (2)

Part 3. Bearings:

Conceptual and Contextual Issues; Types; Design; Classifications; Functions; Applications; Tribology; Advanced Analysis and Design; Load Calculations; Stress Analysis: Fluid-Film Dynamics; Condition Monitoring and Diagnostics; Specialist Issues; Magnetics; Advanced Materials and Coatings; Standards; Specifications; Failure Analysis; etc. (1)

Part 4. Bearings:

Conceptual and Contextual Issues; Types; Design; Classifications; Functions; Applications; Tribology; Advanced Analysis and Design; Load Calculations; Stress Analysis: Fluid-Film Dynamics; Condition Monitoring and Diagnostics; Specialist Issues; Magnetics; Advanced Materials and Coatings; Standards; Specifications; Failure Analysis; etc. (2)



Prof. Dr. R. B. Crawford,

Part 5. Seals (Generally):

Seal Conceptualisation and Contextualisation; Types and Classifications; Seal Functions and Applications; Seal Materials; Tribology of Seals; Seal Design and Selection; Advanced Seal Analysis and Design; Seal Leakage Analysis; Seal Stress Analysis; Mechanical Seal Design; Labyrinth Seal Design; Seal Dynamics; Seal Operation and Maintenance; Condition Monitoring and Diagnostics; Standards and Specifications; Environmental Considerations; Mathematical Modelling; etc. (1)

Part 6. Seals (Generally):

Seal Conceptualisation and Contextualisation; Types and Classifications; Seal Functions and Applications; Seal Materials; Tribology of Seals; Seal Design and Selection; Advanced Seal Analysis and Design; Seal Leakage Analysis; Seal Stress Analysis; Mechanical Seal Design; Labyrinth Seal Design; Seal Dynamics; Seal Operation and Maintenance; Condition Monitoring and Diagnostics; Standards and Specifications; Environmental Considerations; Mathematical Modelling; etc. (2)

Part 7. Seals (Generally):

Seal Conceptualisation and Contextualisation; Types and Classifications; Seal Functions and Applications; Seal Materials; Tribology of Seals; Seal Design and Selection; Advanced Seal Analysis and Design; Seal Leakage Analysis; Seal Stress Analysis; Mechanical Seal Design; Labyrinth Seal Design; Seal Dynamics; Seal Operation and Maintenance; Condition Monitoring and Diagnostics; Standards and Specifications; Environmental Considerations; Mathematical Modelling; etc. (3)



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Part 8. Seal Classification and Bases of Configuration:
Dynamic Seals; Static Seals; Contact Seals; Non-Contact Seals;
Fluid Sealed Seals; Liquid Seals; Gas Seals; Dust/ Contamination
Seals; Low-Pressure Seals; High-Pressure Seals; LowTemperature (Cryogenic) Seals; High-Temperature Seals;
Elastomeric Seals; Metallic Seals; Composite Seals; etc.

Part 9. Pumps:

Pump Hydraulics and Thermodynamics; Pump Principles; Fluid Mechanics of Pumps; Thermodynamics of Pumps; Cavitation; Pump System Design; Centrifugal Pump Design and Operation; Centrifugal Pump Components; Positive Displacement Pump Design and Operation; Positive Displacement Pump Types; Positive Displacement Pump Operation; Comparison of Positive Displacement and Centrifugal Pumps; Specialty Pumps and Applications; Pump Systems and Control; Pump Materials, Maintenance, and Reliability; Pump Standards and Sustainability; Pump Control and Instrumentation; System Resonance and Vibration Analysis; etc. (1)

Part 10. Pumps:

Pump Hydraulics and Thermodynamics; Pump Principles; Fluid Mechanics of Pumps; Thermodynamics of Pumps; Cavitation; Pump System Design; Centrifugal Pump Design and Operation; Centrifugal Pump Components; Positive Displacement Pump Design and Operation; Positive Displacement Pump Types; Positive Displacement Pump Operation; Comparison of Positive Displacement and Centrifugal Pumps; Specialty Pumps and Applications; Pump Systems and Control; Pump Materials, Maintenance, and Reliability; Pump Standards and Sustainability; Pump Control and Instrumentation; System Resonance and Vibration Analysis; etc. (2)



Part 11. Pumps:

Pump Hydraulics and Thermodynamics; Pump Principles; Fluid Mechanics of Pumps; Thermodynamics of Pumps; Cavitation; Pump System Design; Centrifugal Pump Design and Operation; Centrifugal Pump Components; Positive Displacement Pump Design and Operation; Positive Displacement Pump Types; Positive Displacement Pump Operation; Comparison of Positive Displacement and Centrifugal Pumps; Specialty Pumps and Applications; Pump Systems and Control; Pump Materials, Maintenance, and Reliability; Pump Standards and Sustainability; Pump Control and Instrumentation; System Resonance and Vibration Analysis; etc. (3)

Part 12. Lubrication Systems:

General To Advanced Issues; Design; Application-Specific; Maintenance and Reliability; Instrumentation and Control; Advanced Lubrication Materials; Sustainability; Digitisation and Smart; etc.(1)

Part 13. Lubrication Systems:

General To Advanced Issues; Design; Application-Specific; Maintenance and Reliability; Instrumentation and Control; Advanced Lubrication Materials; Sustainability; Digitisation and Smart; etc.(2)

Part 14. Compressors:

Principles of Compression; Types of Compressors; Positive Displacement Compressors; Compression Process; Components of Compressors; Operation and Control; Performance Parameters; Safety and Environmental Considerations; etc.(1)





Part 15. Compressors:

Principles of Compression; Types of Compressors; Positive Displacement Compressors; Compression Process; Components of Compressors; Operation and Control; Performance Parameters; Safety and Environmental Considerations; etc.(2)

Part 16. Hydraulics:

Conceptual and Contextual Issues Associated with Hydraulics; Fluid Properties; Fluid Mechanics; Hydraulic Power; Hydraulic **Components (Detailed Analysis)**; Pumps; ctuators; Accumulators; Filters and Filtration; Piping and Hoses; Reservoirs; Hydraulic System Design and Analysis; Circuit **Performance Analysis**; Control vstems: System Troubleshooting and Maintenance; Safety; Advanced Depending on Course Depth); Computational Fluid Dynamics CFD) for Hydraulic Systems; Advanced Hydraulic Fluids; Digital lydraulics; Hydraulic system efficiency improvements.

Advanced Issues Associated with Hydraulics; Practical Issues Associated with Hydraulics; etc (1)

Part 17. Hydraulics:

Conceptual and Contextual Issues Associated with Hydraulics; Fluid Properties; Fluid Mechanics; Hydraulic Power; Hydraulic Analysis); Components (Detailed /stem Pumps: ctuators; Accumulators; Filters and Filtration; Piping and Hoses Reservoirs: Hydraulic System **Design and Analysis**; **Performance System Analysis**; Control Troubleshooting and Maintenance; Safety; Advanced Topics (Depending on Course Depth); Computational Fluid Dynamics CFD) for Hydraulic Systems; Advanced Hydraulic Fluids; Digital Hydraulics; Hydraulic system efficiency improvements.

Advanced Issues Associated with Hydraulics; Practical Issues Associated with Hydraulics; etc (2)



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Part 18. Hydraulics:

Conceptual and Contextual Issues Associated with Hydraulics; Fluid Properties; Fluid Mechanics; Hydraulic Power; Hydraulic **Components** (Detailed **Analysis)**; Pumps: Actuators; Accumulators; Filters and Filtration; Piping and Hoses; Hydraulic System Design and Analysis; Reservoirs; Design; System **Performance Analysis**; Control Troubleshooting and Maintenance; Safety; Advanced Topics Depending on Course Depth); Computational Fluid Dynamics CFD) for Hydraulic Systems; Advanced Hydraulic Fluids; Digital Hydraulics; Hydraulic system efficiency improvements.

Advanced Issues Associated with Hydraulics; Practical Issues Associated with Hydraulics; etc (3)

Part 19.Turbines:

Key Conceptual and Contextual Elements of Turbines; Introduction to Turbomachinery; Thermodynamic Principles; Fluid Dynamics; Types of Turbines;

Gas Turbines; **Hydraulic Turbines**; Turbines: Turbines; Turbine Design and Analysis; Blade Design; Rotor **Analysis**; **Performance Turbine** Operation Maintenance; **Control Systems: Maintenance** and Inspection; Troubleshooting; Advanced Topics; Combined Cycle Power Advanced Turbine Technologies; Renewable Energy Integration: Digital Twins and Predictive Maintenance; etc.

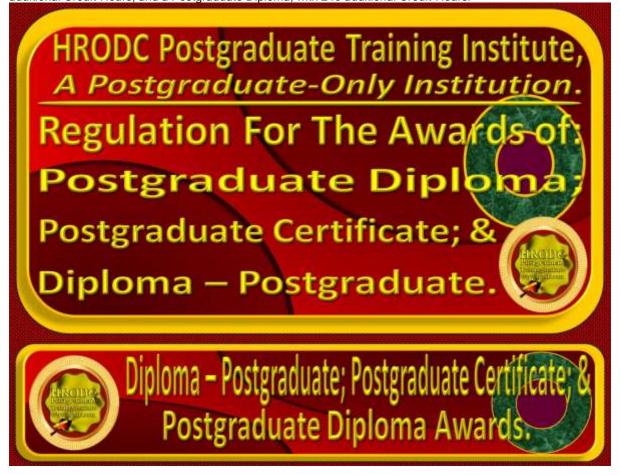
Part 20.Turbines:

Key Conceptual and Contextual Elements of Turbines; Introduction to Turbomachinery; Thermodynamic Principles; Fluid Dynamics; Types of Turbines;

Gas Turbines; **Hydraulic Turbines**; Turbines; Wind Turbines; Turbine Design and Analysis; Blade Design; Rotor **Performance Analysis**; Dynamics; **Turbine Operation Maintenance**; Control Systems; Maintenance and Inspection; Troubleshooting; **Advanced Topics:** Combined Cvcle **Turbine** Advanced Technologies; Integration; Digital Twins and Predictive Maintenance; etc.

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Postgraduate Short Courses are of a minimum of five days' In-Venues (10 days' Online) but less than 6 weeks' In-Venues (less than 10 weeks' 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-Venues (10- and 20-weeks' 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 In-Venues Study, or 10 Online Delivery. Similarly, a Postgraduate Dip - PG - in Rotating Equipment: Design, Testing, Maintenance, Quad Credit, 120 Credit-Hours. Page 15 of 22



Diploma might be studied for 12 weeks In-Venues or 20 weeks. 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 In-Venues and Online Deliveries. Each Five-Day In-Venues, or a Ten-Day Online (3 hours per day) Course consists of 30 Credit-Hours, while a 6-Day In-Venues (12-day Online) 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:

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:
- Diploma Postgraduate in University and Higher
 Education Administration, Triple-Credit, 90 Credit-Hours;
- 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



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.

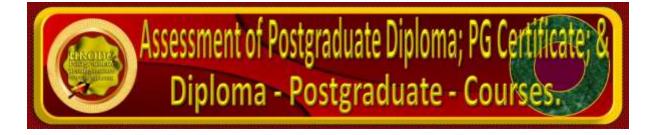
Admission and Enrolment Procedure

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;

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- 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;
 - o 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-Venues, and 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:

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- 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.



You might study a Postgraduate Diploma, or Postgraduate Certificate, in 20 or 10 weeks, respectively, in the comfort of your offices or homes, through our Postgraduate Training Institute's Online Delivery Mechanism. We are committed to your achieving the 360 or 180 Credit-Hours, respectively, in line with our Regulation, within the stipulated timeframe. The direct "Student-Lecturer-Contact-Times" of 3 hours per day, 6 days per week will ensure that these requirements are met. We aim to fit the tuition around your work, family commitment and leisure, thereby enhancing your Dip - PG - in Rotating Equipment: Design, Testing, Maintenance, Quad Credit, 120 Credit-Hours. Page 20 of 22



maintenance of an effective 'work-study-life-style balance', at times convenient to you and your appointed tutor.



Click, or copy and paste the URL, below, into your Web Browser, to view our Service Contract, incorporating Terms and Conditions.

https://www.hrodc.com/Service Contract Terms and Conditions Service Details

Delivery Point Period Cancellations Extinuating Circumstances Payment Protoc

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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.







