

COURSE OVERVIEW HE1937
Industrial Hygiene Certification Program
BOHS-M502: The Thermal Environment and Other Radiation
Hazards

(Accredited by the British Occupational Hygiene Society - BOHS)

Course Title

Industrial Hygiene Certification Program: BOHS-M502: The Thermal Environment and Other Radiation Hazards *(Accredited by the British Occupational Hygiene Society - BOHS)*



Course Date/Venue

August 16-20, 2026/TBA Meeting Room, Lancaster Bangkok, Bangkok, Thailand

Course Reference

HE1937

Course Duration

Five days/3.7 CEUs/37 PDHs



Course Description



This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

This course aims to provide an understanding of the effects of the thermal environment and other forms of radiation on people, and the means of assessing and controlling the risks associated with thermal stress.



On completion of this course, you will be able to:-

- Identify sources of thermal stress within the working environment
- Understand the nature of thermal strain on the body
- Evaluate the possible risks from exposure to thermal stress
- Identify sources of ionising and non-ionising radiation, including electromagnetic radiation
- Understand the long- and short-term health effects of different forms of radiation
- Make an assessment of the environment in the context of exposure to different forms of radiation through appropriate measurement and other means
- Suggest appropriate control approaches for the thermal environment





This course is designed to provide participants with a detailed and up-to-date overview of BOHS-M502: The Thermal Environment and Other Radiation Hazards. It covers the radiation and thermal spectrum, the principles of heat stress, heat strain, homeostasis and thermal regulation including feedback and control mechanisms; the physiological responses to hot environment and cold environments; the heat production and heat exchanges with the surroundings; the heat balance equation, metabolic heat production and efficiency, sensible heat exchanges, latent heat loss and acclimatization; and the effects of excessive heat strain covering hot and cold environments and the predisposing factors.

During this interactive course, participants will learn the thermal comfort, scales for subjective evaluation of comfort, actual ideal indoor environments and work of fanger; evaluating hot and cold environments using heat stress indices and recognize the effect of heat stress; the effective and corrective effective temperatures, heat stress index, required sweat rate (PHS) and assessment indices; the control of hot and cold environments; and the thermal surveys, risk assessment, ionising and non-radiation and work environment.

This course will require at least 45 hours of study time, of which at least 37 hours will be taught (teaching and practical assessments) and 8 hours will be independent (in your own time).

Course Objectives/Outcomes & Benefits for the Participants

Upon the successful completion of this course, each participant will be able to:

- Achieve the BOHS Certificate in BOHS-M502: The Thermal Environment and Other Radiation Hazard
- Discuss radiation and thermal spectrum covering extreme temperatures, moderate temperatures, climate change and ionising and non-ionising radiation including the electro-magnetic spectrum
- Explain the principles of heat stress, heat strain, homeostasis and thermal regulation including feedback and control mechanisms
- Assess physiological responses to hot environment and cold environments as well as discuss heat production and heat exchanges with the surroundings
- Recognize the heat balance equation, metabolic heat production and efficiency, sensible heat exchanges, latent heat loss and acclimatisation
- Identify the effects of excessive heat strain covering hot and cold environments and the predisposing factors
- Discuss thermal comfort, scales for subjective evaluation of comfort, actual ideal indoor environments and work of fanger
- Evaluate hot and cold environments using heat stress indices and recognize the effect of heat stress
- Explain effective and corrective effective temperatures, heat stress index, required sweat rate (PHS) and assessment indices
- Discuss the control of hot and cold environments comprising of personal factors mitigating against 'hot' work, simple introduction to control by engineering and organisational measures, hot and cold surfaces and managing heat stress
- Apply thermal surveys and risk assessment and discuss ionising and non-radiation and the work environment

Exclusive Smart Training Kit - H-STK®



Participants of this course will receive the exclusive “Haward Smart Training Kit” (H-STK®). The H-STK® consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.

Who Should Attend

This course provides an overview of all significant aspects and considerations of thermal environment and other radiation hazards for technicians and technologists who conduct measurements and testing in workplaces.

Exam Eligibility & Structure

There are no prerequisites required for this qualification.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures
- 20% Practical Workshops & Work Presentations
- 30% Hands-on Practical Exercises & Case Studies
- 20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Learning Design & Customization

This course can be customized to the exact requirements of clients. Haward Technology is so proud of our huge capabilities in tailoring our courses to the training needs of our valued clients.

Course Fee

US\$ 7,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Exam Fee

US\$ 215 per Delegate + **VAT**

Accommodation

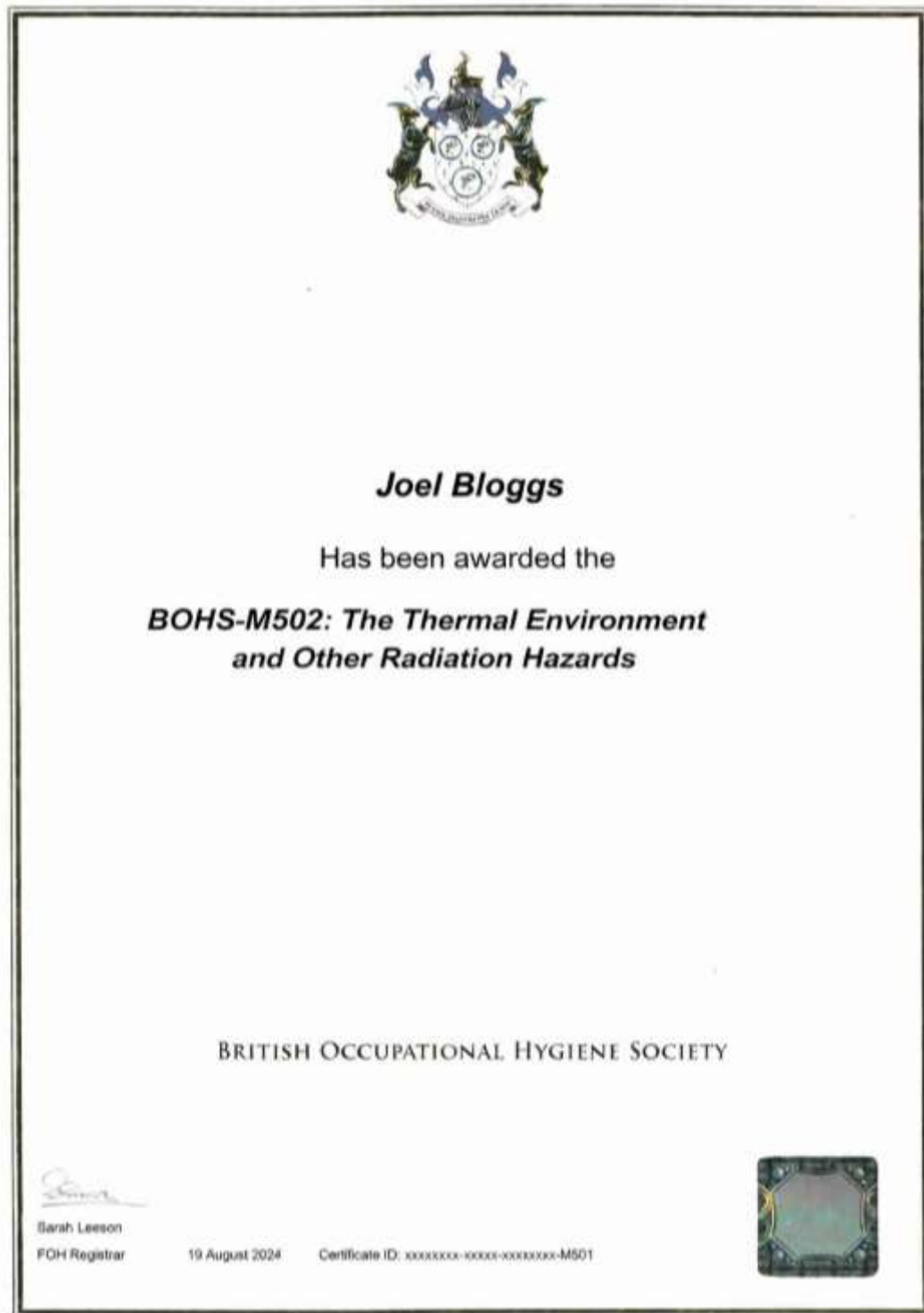
Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Certificate(s)

(1) BOHS-M502 – Thermal Environment and Other Thermal Radiation Hazards will be awarded to participants who have successfully completed the course and passed all the parts (A and B) within 12 months.

BOHS Certificate(s)

The following certificate is a sample of the BOHS certificates that will be issued to successful candidates:-





- (2) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course.

Haward Technology Middle East
Continuing Professional Development (HTME-CPD)

CEU Official Transcript of Records

TOR Issuance Date: 14-Nov-24
HTME No. 74851
Participant Name: Waleed Al Habeeb

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
HE1937	Industrial Hygiene Certification Program: BOHS-M502: The Thermal Environment and Other Radiation Hazards (Accredited by the British Occupational Hygiene Society - BOHS)	Nov 10-14, 2024	37	3.7

Total No. of CEU's Earned as of TOR Issuance Date **3.7**

TRUE COPY

Jaryl Castillo
 Academic Director

Haward Technology has been approved as an Accredited Provider by the International Association for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Hamden, VA 20171, USA. In obtaining this approval, Haward Technology has demonstrated that it complies with the ANS/MACET 1-2018 Standard which is widely recognized as the standard of good practice internationally. As a result of their Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for programs that qualify under the ANS/MACET 1-2018 Standard.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking Continuing Education Units (CEUs) in accordance with the rules & regulations of the International Association for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in-qualified courses of continuing education.

Haward Technology is accredited by

P.O. Box 26070, Abu Dhabi, United Arab Emirates | Tel.: +971 2 3091 714 | E-mail: info@haward.org | Website: www.haward.org



Certificate Accreditations

Haward Technology is accredited by the following international accreditation organizations:-



- The British Occupational Hygiene Society (BOHS)

Haward Technology is an Approved Training Partner of the British Occupational Hygiene Society (BOHS) for the M201 and M500 series modules, which are designed to maintain a high standard of occupational hygiene education.

Together with BOHS, Haward Technology supports hygiene professionals in their mission to create safe working environments globally and is committed to advancing the practice of occupational hygiene to promote healthier workplaces worldwide.



- British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.



- The International Accreditors for Continuing Education and Training (IACET - USA)

Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **3.7 CEUs** (Continuing Education Units) or **37 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:



Mr. Peter Jacobs, is a **Senior HSE Consultant** with almost **25 years** of extensive experience within **Oil & Gas, Refinery and Petrochemical** industries. His wide experience covers in the areas of **OHTA Modules** (Measurement of Hazardous Substances, Thermal Environment, Noise Measurement & Its Effects, Asbestos & Other Fibers, Control of Hazardous Substances, Ergonomics Essentials, Health Effects of Hazardous Substances), Advanced **Industrial Hygiene, Incident Command & Report Writing, HAZOP, HAZMAT, HAZID, Health Risk Assessment, Modern Safety Risk Management, Process Risk Management, Root Cause Analysis** Techniques, **HSE Management System Development & Implementation, SAESI Hazardous Materials for the First Responder Operations (NFPA 472), Industrial Safety & Housekeeping, Job Safety & Hazard Analysis, Hazardous Substances Measurement, Workplace Control, Physical Agents, Emergency Response, Chemical & Biological Operations, Basic Safety & Loss Prevention, Safety in Chemical Laboratory, Confined Space Safety, Industrial Hygiene, Occupational Health & Hygiene, Ergonomics, Biological Assessment, Radiation with Radon/Thoron Assessment, Radiation Protection Safety, Radiation Monitoring, Natural Radiation Sources, Nuclear Regulatory Act, Industrial Ventilation, Air Pollution Dispersion Modelling, Basic Clandestine Drug Laboratory Investigation, Chemical Engineering, Fire Safety & Evacuation, Evacuation Safety, Safety Orientation, Hand & Power Tools Safety, Isokinetic Stack Sampling, Dust Exposure, Quantifying Workplace Stressors, Noise & Airborne Pollutants, Thermal Stress, Illumination, Mine Health & Safety, Statistical Method Validation, Legal Audit Compliance, Riot & Crowd Control, ISO 14000, OHSAS 18000, ISO 17025 and ISO 9000.**

During his career life, Mr. Jacobs has gained his practical and field experiences through his various significant positions and dedication as the **Forensic Science Laboratory Manager, Occupational Hygienist, Radiation Protection Officer, Lead Practitioner, Safety, Health & Environmental (SHE) Specialist, First Responder, OHS Inspector, Ambulance Assistant and LPG Distributor Auditor** from various international companies like the Sedulitas, Richards Bay Minerals, Sasol and South African Police Service.

Mr. Jacobs has a **Master's degree in Public Health – Occupational Hygiene, a National Diploma in Purchasing Management and an Intermediate Certificate in Mine Environmental Control** an **Accredited South African Emergency Services Institute (SAESI)**. Further, he is a **Certified Instructor/Trainer**, an Appointed Commissioned Officer, a SAIOH/ IOHA President, an Assessor/Moderator of Health & Welfare SETA, a **Registered Occupational Hygienist** of the Southern African Institute for Occupational Hygiene, awarded as a SAIOH **Occupational Hygienist of the Year Award** and a well-regarded member of the British Occupational Hygiene Society (**BOHS**), Mine Ventilation Society of South Africa (MVSSA) and South African Radiological Protection Association (SARPA). He has further delivered numerous trainings, courses, seminars, workshops and conferences worldwide.



Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1: Sunday, 16th of August 2026

0730 – 0745	Registration & Coffee
0745 - 0800	Welcome & Introduction
0800 - 0815	PRE-TEST
0815 - 0930	The Radiation & Thermal Spectrum Extreme Temperatures: Examples of Work Environments where Extreme Temperatures can be Found, Including Typical & High Risk Working Environments • Moderate Temperatures: How Work in Moderate Thermal Environments can Present a Risk Including Typical & High Risk Working Environments
0930 – 0945	Break
0945 - 1015	The Radiation & Thermal Spectrum (cont'd) Climate Change: How Climate Change & Measures to Address Climate Change may Impact on Risk in the Thermal Environment • Ionising & Non-Ionising Radiation, Including the Electro-Magnetic Spectrum: How Radiation Sources Including Typical & High Risk Working Environments can Present a Risk
1015 - 1230	Principles Definition of Heat Stress • Definition of Heat Strain • Homeostasis (Understand the Principles of Homeostasis; Be Aware of Typical Core, Muscle & Skin Temperatures & How They Vary with Environmental & Other Conditions) • Thermal Regulation Including Feedback & Control Mechanisms (Thermoregulation through a Feedback System; The Role of the Hypothalamus; Thermoreceptors, Control Actions such as Shivering, Vasomotor etc.)
1230 – 1330	Lunch
1330 - 1500	Principles (cont'd) Physiological Responses to Hot Environment (Vasodilation, Sweating, Electrolyte Changes, Dehydration, Heart Rate, Respiration Rate, Other Effects) • Physiological Responses to Cold Environments (Vasoconstriction, Shivering, Piloerection, Cold Diuresis, Respiration, Heart Rate, Dehydration, Psychological, Other Responses) • Heat Production & Heat Exchanges with the Surroundings (External Heat Sources, Internal Heat Sources, Basic Thermodynamics) • The Heat Balance Equation - Definition of Terms (The Heat Balance Equation, Definition of Terms)
1500 – 1515	Break
1515 - 1620	Principles (cont'd) Metabolic Heat Production & Efficiency (Metabolic Heat Production, Typical Values of Metabolic Heat Production for Different Tasks, Work) • Sensible Heat Exchanges (Convection, Radiation, Conduction) • Latent Heat Loss (Evaporative Heat Loss) • Acclimatisation (Physiological Mechanisms)
1620 – 1630	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1630	End of Day One





Day 2: Monday, 17th of August 2026

0730 – 0930	Effects of Temperature Extremes Effects of Excessive Heat Strain – Hot Environments (Syncope, Salt Balance, Dehydration, Cramps, Hyperpyrexia, Prickly Heat, Heat Stroke) • Effects of Excessive Heat Strain – Cold Environments (Frostbite, Trench Foot, Hypothermia)
0930 - 0945	Break
0945 - 1100	Effects of Temperature Extremes (cont'd) Predisposing Factors (Age, General Health, Weight & Physical Fitness, Other Susceptibilities (Diabetes, Menopause, Pregnancy etc.), Hydration State, Acclimatisation, Alcohol, Drugs, Diet, Fatigue)
1100 - 1230	Thermal Comfort Thermal Comfort (What is Thermal Comfort?, Why Thermal Comfort can be Important) • Scales for Subjective Evaluation of Comfort (Bedford, American Society of Heating, Refrigerating & Air-Conditioning Engineers (ASHRAE)) • Actual Ideal Indoor Environments (Temperature, Humidity & Air Movement) • An Introduction to the Work of Fanger (Predicted Percentage Dissatisfied (PPD), Predicted Mean Vote (PMV), ISO 7730)
1230 - 1330	Lunch
1330 - 1500	Evaluation of Hot & Cold Environments The Use of Heat Stress Indices (Definition of Terms & Environments where Indices can be Applied, Effective & Corrected Effective Temperature, Wet Bulb Globe Temperature (WBGT), Heat Stress Index, Required Sweat Rate) • Effect of Heat Stress (Physiological Measurements as Predictors of Heat Strain) • Effective & Corrective Effective Temperatures (Application of Basic Effective Temperature (BET) & Corrective Effective Temperature (CET))
1500 – 1515	Break
1515 - 1620	Evaluation of Hot & Cold Environments (cont'd) Heat Stress Index (Application of the Heat Stress Index) • Required Sweat Rate (PHS) (Application of the Required Sweat Rate)
1620 – 1630	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1630	End of Day Two

Day 3: Tuesday, 18th of August 2026

0730 – 0930	Evaluation of Hot & Cold Environments (cont'd) Assessment Indices (Wind Chill Index, Equivalent Chilling Temperature, Hydro-Québec Research Institute (IREQ), American Conference of Governmental Industrial Hygienists (ACGIH) TLV Standards
0930 - 0945	Break
0945 - 1230	Control of Hot & Cold Environments Personal Factors Mitigating Against 'Hot' Work (Obesity, Medication, Age & Other Factors, State of Acclimatisation)
1230 - 1330	Lunch
1330 – 1515	Control of Hot & Cold Environments A Simple Introduction to Control by Engineering & Organisational Measures (Control Strategies, Hierarchy of Control, Complex & High-Risk Work Environments, Engineering Controls, Management Controls, Including Training, Awareness & Communication, Personal Protective Equipment & Clothing, Refuges, Communication & Reporting, Record Keeping & Data Protection, Emergency Planning, First Aid & Emergency Response, Ethical Considerations)





1515 - 1530	Break
1530 - 1620	Control of Hot & Cold Environments (cont'd) Hot & Cold Surfaces (Exposure to Hot & Cold Surfaces) • Managing Heat Stress (Designing & Managing a Programme for Heat Stress, Costs & Benefits, Inter-Disciplinary Working, Including Liaison with Operational Management & Maintenance Managers, Audit & Review of Programmes)
1620 - 1630	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1630	End of Day Three

Day 4: Wednesday, 19th of August 2026

0730 - 0930	Thermal Surveys & Risk Assessment Measurement Equipment (Air Temperature, Radiant Temperature, Humidity, Air Movement, Integrating Meters, Personal Monitoring, Including Wearable Devices, Personal & Environmental Data Interaction) • Surveys (Strategies, Implementation) • Assessment of the Degree of Risk (Use of Measurement Data, Data Management) • Cold Environment Personal Factors (Heart & Lung Conditions, Circulatory Problems) • Engineering Controls (Wind Barriers, Refuges)
0930 - 0945	Break
0945 - 1230	Thermal Surveys & Risk Assessment (cont'd) Management Controls (Monitoring, Work – Rest Regimes/Warming Regimes) • Clothing (Clothing Insulation & CLO Values, Wind Proofing, Water Proofing, Gloves, Heated Clothing) • Australian Institute of Occupational Hygienists (AIOH) Tiered Approach to Thermal Risk Assessment (Overview & Application, Advantages & Disadvantages) • South African Department of Mineral Resources (SA DoMR) Code of Practice for An Occupational Health Programme on Thermal Stress (Overview & Application, Advantages & Disadvantages) • ACGIH Thermal Stress TLVs (Overview & Application, Advantages & Disadvantages)
1230 - 1330	Lunch
1330 - 1530	Thermal Surveys & Risk Assessment (cont'd) Quantitative versus Qualitative Approaches (Quantitative versus Qualitative Approaches) • Physiological Assessments • Variability & Uncertainty • Risk Assessment & Control
1530 - 1545	Break
1545 - 1620	Ionising Radiation & the Work Environment What is Ionising Radiation? • Human Made & Natural Sources of Ionising Radiation • Identification & Basic Measurement Principles • Internal & External Exposure Routes for Ionising Radiation • Radiation Damage to Tissue and/or Organs • Long & Short-Term Effects of Ionising Radiation on Human Tissue & Organ Function
1620 - 1630	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1630	End of Day Three





Day 5: Thursday, 20th of August 2026

0730 - 0930	Ionising Radiation & the Work Environment (cont'd) <i>Exposure Situations, i.e. Planned, Existing & Emergency Situations • Typical & High-Risk Work Environments with Radiation Risk • Understanding Sievert (Sv) Calculations • Control Measures for Ionising Radiation • Radiation Protection Advisers</i>
0930 - 0945	Break
0945 - 1230	Non-Ionising Radiation & the Work Environment (cont'd) <i>What is Non-Ionising Radiation? • Human Made & Natural Sources of Non-Ionising Radiation</i>
1230 - 1330	Lunch
1330 - 1415	Non-Ionising Radiation & the Work Environment (cont'd) <i>Identification & Basic Measurement Principles • Radiation Damage to Tissue and/or Organs</i>
1415 - 1430	Break
1430 - 1545	Non-Ionising Radiation & the Work Environment (cont'd) <i>Long- & Short-Term Effects of Different Forms of Non-Ionising Radiation on Human Tissue & Organ Function • Exposure Situations • Typical & High-Risk Work Environments with Non-Ionising Radiation Risk • Control Measures for Non-Ionising Radiation Risks</i>
1545 - 1600	POST-TEST
1600 - 1615	Course Conclusion <i>Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course</i>
1615 - 1630	<i>Presentation of Course Certificates</i>
1630	<i>End of Course</i>

MOCK Exam

Upon the completion of the course, participants have to sit for a MOCK Examination similar to the exam of the Certification Body through Haward's Portal. Each participant will be given a username and password to log in Haward's Portal for the MOCK exam during the 60 days following the course completion. Each participant has only one trial for the MOCK exam within this 60-day examination window. Hence, you have to prepare yourself very well before starting your MOCK exam as this exam is a simulation to the one of the Certification Body.

Examinations & Assessment

You are required to pass all of the following parts (A and B below) to be awarded this qualification.

(A) Practical Assessment

The practical assessment will be conducted by the Course Instructor during the relevant parts of the course for all candidates. This is to ensure that each candidate can demonstrate their individual ability and correct method.

The course is designed to assess your basic skill and knowledge in making measurements of conditions for the purpose of assessing the thermal environment.

The exercises will include:

- The set up and reading of a static wet and dry bulb thermometer and calculation of humidity etc.
- The set up and use of a whirling hygrometer and a globe thermometer to evaluate a WBGT value.



Full details of the practical requirements and individual candidate reporting can be found in the Practical Evaluation Report which is available from www.bohs.org

(B) Written Examination

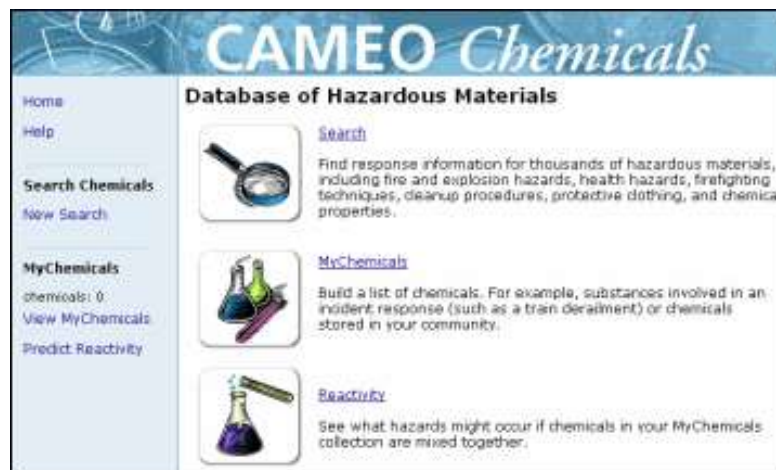
This is an open-book examination comprising of 40 (160 marks) short-answer questions illustrated by photographs and diagrams as appropriate to be answered in 2 hours. Each question is worth 4 marks.

The examination covers all sections of the syllabus and is overseen by an invigilator.

The pass mark for this examination is 50 %

Simulators (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the Environmental simulators “CAMEO Chemicals Suite Software”, “US EPA SCREEN3 Model”, “AERSCREEN Model”, “Industrial Hygiene Virtual Laboratory Simulator” and “CIHprep V9.0 Simulator”.

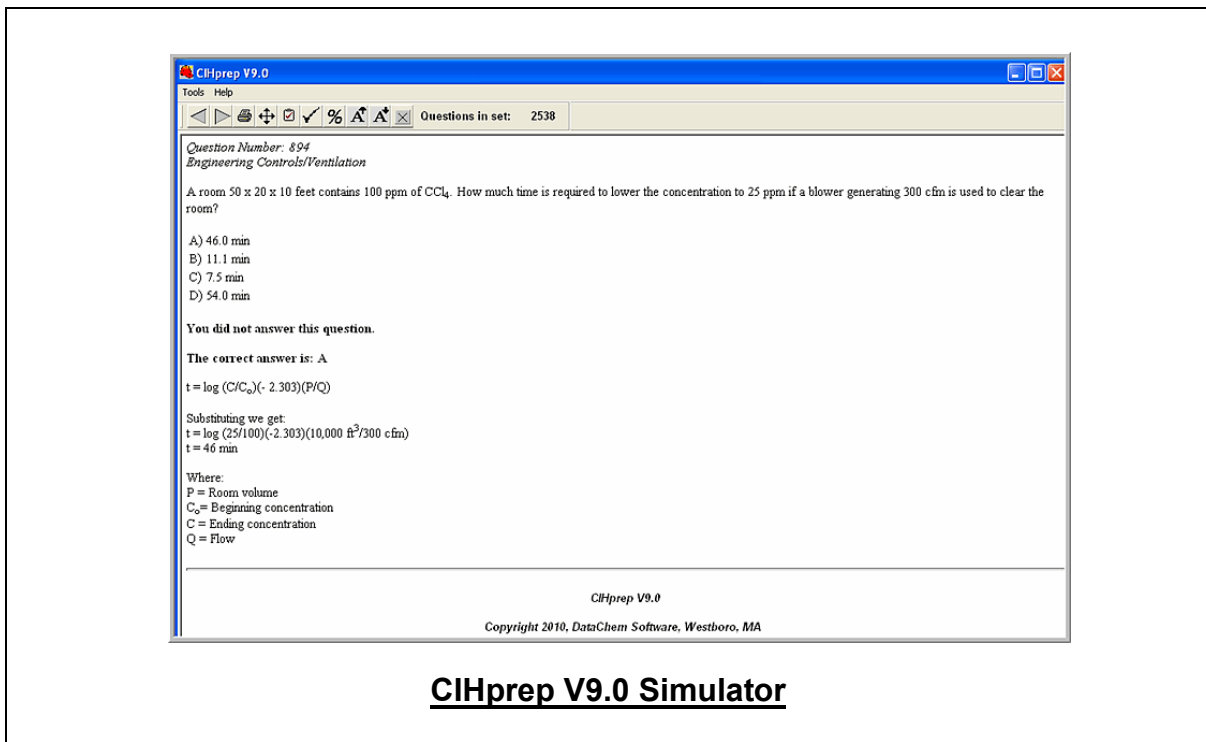


CAMEO Chemicals Suite Software





Industrial Hygiene Virtual Laboratory Simulator



CIHprep V9.0 Simulator

Course Coordinator

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