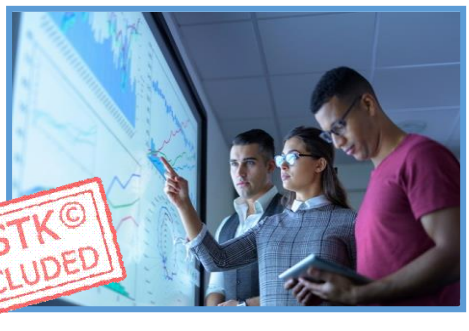
COURSE OVERVIEW HE0563-4D
Climate Modeling and Climate Change

Course Title
Climate Modeling and Climate Change

Course Reference
HE0563-4D

Course Duration/Credits
Four days/2.4 CEUs/24 PDHs



Course Date/Venue

Session(s)	Date	Venue
1	May 18-21, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
2	July 14-17, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
3	September 28-October 01, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
4	December 15-18, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Description

This practical and highly-interactive course includes real-life case studies where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with a detailed and up-to-date overview of Climate Modeling and Climate Change. It covers the difference between climate and weather and the factors controlling Earth's climate system; the greenhouse effect and global warming; the difference between natural versus anthropogenic climate change; the climate change evidence and observations; the impacts of climate change on petroleum industry; the climate policy and international agreements, climate modelling and general circulation models (GCMs); and the regional climate models (RCMs) and downscaling including data sources and climate model inputs.

During this interactive course, participants will learn the uncertainty in climate modelling and physical risks of climate change to oil and gas industry; the transition risks, climate change and energy transition; the climate change impact on oil exploration and production; the climate-induced risks to supply chain and logistics; the strategies for climate adaptation in oil and gas; the carbon capture, utilization, and storage (CCUS); the methane emission reduction strategies; the renewable energy integration in petroleum sector; the hydrogen economy and the future of oil; the role of digitalization in climate mitigation; and the climate finance, carbon markets and ESG and sustainability.

Course Objectives

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

- Apply and gain an in-depth knowledge on climate modeling and climate change
- Discuss the difference between climate and weather and the factors controlling Earth's climate system
- Identify the greenhouse effect and global warming and differentiate natural versus anthropogenic climate change
- Assess climate change evidence and observations and discuss the impacts of climate change on petroleum industry
- Review climate policy and international agreements, climate modelling and general circulation models (GCMs)
- Discuss regional climate models (RCMs) and downscaling including data sources and climate model inputs
- Describe uncertainty in climate modelling and physical risks of climate change to oil and gas industry
- Discuss transition risks, climate change and energy transition and climate change impact on oil exploration and production
- Recognize climate-induced risks to supply chain and logistics and apply strategies for climate adaptation in oil and gas
- Explain carbon capture, utilization, and storage (CCUS) and apply methane emission reduction strategies
- Apply renewable energy integration in petroleum sector and discuss the hydrogen economy and the future of oil
- Define the role of digitalization in climate mitigation and discuss climate finance, carbon markets and ESG and sustainability

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 climate modeling and climate change for professionals and researchers, government and policy makers, industry and business leaders, non-governmental organizations (NGOS) and activist's and other technical staff.

Course Fee

US$ 4,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

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

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. 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 **2.4 CEUs** (Continuing Education Units) or **24 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.

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.

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 Christian is an **International Expert** in **Safety**, **Health**, **Environmental** and **Quality** with over **30 years** of practical and industrial experience in **NEBOSH** International General Certificate in Occupational Health & **Safety**, **Lifting & Rigging Equipment HAZOP**, **HAZWOPER**, **HAZMAT**, **HAZCOM**, **PHA** (**Process Hazard Analysis**), **FMEA**, **HAZID**, **ISO 14001**, **OHSAS 18001**, **ISO 9001**, Process Safety Management (**PSM**), Safety, Health, Environmental & Quality Management (**SHEQ**), **Behavioral Safety Management**, **Industrial Hygiene**, **Human Factors Engineering**, **Risk Assessment**, Fire Fighting, Rope Rescue Operations, Emergency Response within process industries. He is currently the **President** of **NKWE** and spearheads the companies major projects and business ventures, where he specializes in the areas of **SHEQ** solutions, **ISO**, **Quality Control** and **OSHA systems**. Previously, he has had much on–hand experience in the initiation and management of projects (technical as well organizational development) including involvement in **design of process plants**; **the commissioning & decommissioning** of process plants; the **operational and financial responsibility** for large process operations; **risk management**; **operational and maintenance management**, **crisis and emergency management**, **accident investigation**, **risk assessment**, **hazard identification** and **emergency preparedness & response** (oil spillage and gas explosions).

Much earlier in his career, Mr. Christian was a **HAZOP Team Leader** for numerous **HAZOP** studies and he has further managed the **Health, Safety & Environmental** and **Quality** requirements of a large process company. This included responsibilities as an auditor for compliance against **SHEQ standards**, **ISO standards** and the **Fatal Risk Control Protocols**. He then facilitated the development and implementation of the above standards as a group and at site level as part of the SHEQ council. Moreover, he established, trained and led a Rope rescue team and a high level emergency care clinic and ambulance service for many years. He still abseils recreationally and leads adventure groups during abseiling activities and serves as a rescue team member for mountain and water emergencies.

During his career life, Mr. Christian has gained his practical and field experience through his various significant positions as the **Plant Manager**, **Project Metallurgist**, **Metallurgist**, **HSE Team Leader**, **SHEC Superintendent**, **Mentor**, Instructor/Trainer, Acting **Technical Manager**, **Process Plant Superintendent**, Acting **Project Leader**, Acting **Plant Superintendent**, Appointed **Health & Safety & Environmental Superintendent**, Production Technician, Acting **Senior Shiftsman**, Foreman and Learner – Official Extraction Metallurgy from various companies such as the NKWE Consulting, SAMANCOR, Middleburg Mine Services (Pty) Ltd., Koomfontein Mines, Emelo Mine Services, Gencor Group and South African Defence Force.

Mr. Christian has a **Postgraduate Studies** in **Advanced Executive Programme** and a **National Higher Diploma** (**NHD**) & a **National Diploma** in **Extraction Metallurgy**. He is also a **Certified/Registered Tutor** in **NEBOSH International General Certificate**, **Certified Auditor** in **OHSAS 18001**, **ISO 14001** & **ISO 9001**, a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**), a **Six Sigma Black Belt Coach** and holds a Certificate in Facilitate Learning Using a Variety of Given Methodologies **NQF Level 5** (**EDTP-SETA**) as a **Certified Facilitator**. He has further delivered innumerable courses, trainings, workshops and conferences globally.

Course Program

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

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0900	***Introduction to Climate Science*** *Definition and Scope of Climate Science • Difference Between Climate and Weather • Factors Controlling Earth's Climate System • Role of Oceans and Atmosphere in Climate Regulation*
0900 - 0930	***The Greenhouse Effect & Global Warming*** *Mechanism of the Greenhouse Effect • Key Greenhouse Gases (CO_2, CH_4, N_2O, Water Vapor) • Sources and Sinks of Greenhouse Gases • Impacts of Enhanced Greenhouse Effect on Global Temperature*
0930 – 0945	*Break*
0945 – 1030	***Natural versus Anthropogenic Climate Change*** *Natural Climate Variability (Solar Cycles, Volcanic Eruptions) • Human-Induced Climate Change (Fossil Fuel Combustion, Deforestation) • Understanding Climate Feedback Loops • Industrial Contributions to Climate Change*
1030 – 1130	***Climate Change Evidence & Observations*** *Global Temperature Trends Over Time • Changes in Precipitation Patterns and Extreme Weather Events • Ice Sheet and Glacial Melting • Ocean Acidification and Sea Level Rise*
1130 – 1215	***Impacts of Climate Change on Petroleum Industry*** *Rising Temperatures and Their Effect on Oil and Gas Operations • Changes in Energy Demand and Consumption • Climate Risks to Offshore and Onshore Infrastructure • Regulatory Pressures for Emission Reduction in Petroleum Sector*
1215 – 1230	*Break*
1230 – 1330	***Climate Policy & International Agreements*** *The Paris Agreement and Net-Zero Targets • Role of the United Nations Framework Convention on Climate Change (UNFCCC) • Nationally Determined Contributions (NDCs) • Climate Policy and Compliance*
1330 – 1420	***Basics of Climate Modeling*** *Definition and Purpose of Climate Models • Types of Climate Models (Conceptual, Statistical, Numerical) • Components of a Climate Model (Atmosphere, Land, Ocean, Ice) • Role of Supercomputers in Climate Simulations*
1420 – 1430	***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*
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Understanding General Circulation Models (GCMs)*** *Structure and Resolution of GCMs • Parameterization in Climate Models • Strengths and Limitations of GCMs • Key GCMs Used by IPCC and Research Institutions*
0830 – 0930	***Regional Climate Models (RCMs) & Downscaling*** *Need for High-Resolution Regional Climate Models • Statistical vs. Dynamical Downscaling • Application of RCMs in Oil and Gas Operations • Case Studies of RCMs in the Middle East*
0930 – 0945	*Break*
0945 – 1100	***Data Sources & Climate Model Inputs*** *Historical Climate Data and Instrumentation • Satellite Observations and Remote Sensing in Climate Science • Role of Proxy Data (Tree Rings, Ice Cores, Sediments) • Importance of High-Quality Emission Scenarios*
1100 – 1215	***Uncertainty in Climate Modeling*** *Sources of Uncertainty in Climate Projections • Model Sensitivity and Climate Forcing Factors • Importance of Multi-Model Ensemble Approaches • Communication of Uncertainty in Policy Making*
1215 – 1230	*Break*
1230 – 1330	***Case Study: Evaluating Climate Models for the Arabian Gulf*** *Historical Climate Trends in the Arabian Gulf • Projected Temperature and Precipitation Changes • Impacts on Operations and Infrastructure • Strategies for Adaptation and Mitigation in Petroleum Industry*
1330 – 1400	***Physical Risks of Climate Change to Oil & Gas Industry*** *Increased Frequency of Extreme Weather Events • Rising Sea Levels and Coastal Infrastructure Vulnerability • Higher Ambient Temperatures Affecting Equipment Efficiency • Changes in Water Availability for Cooling and Refining*
1400 - 1420	***Transition Risks: Economic & Regulatory Challenges*** *Carbon Pricing and Financial Implications • Stricter Environmental Regulations and Compliance Costs • Shifts in Energy Demand and Market Trends • Investor and Shareholder Pressures for Sustainability*
1420 – 1430	***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*
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Climate Change & Energy Transition*** *Shift from Fossil Fuels to Renewable Energy • Role of Hydrogen and Carbon Capture in the Oil Sector • Net-Zero Goals for Oil and Gas Companies • Initiatives for Low-Carbon Energy Production*
0830 – 0930	***Climate Change Impact on Oil Exploration & Production*** *Changing Weather Patterns Affecting Offshore Drilling • Permafrost Thawing and Its Impact on Arctic Oil Extraction • Reservoir Management Under Changing Climate Conditions • Role of Enhanced Oil Recovery (EOR) in a Low-Carbon Future*
0930 – 0945	*Break*
0945 – 1100	***Climate-Induced Risks to Supply Chain & Logistics*** *Increased Transportation Costs Due to Weather Uncertainty • Impact on Pipeline Integrity and Maintenance Needs • Disruptions in Global Supply Chains Due to Extreme Events • Need for Climate-Resilient Infrastructure in Oil and Gas*

1100 – 1215	***Strategies for Climate Adaptation in Oil & Gas*** *Enhancing Infrastructure Resilience • Developing Climate-Resilient Workflows and Operations • Investing in Early Warning Systems for Extreme Events • Sustainable Water and Resource Management*
1215 – 1230	*Break*
1230 – 1330	***Carbon Capture, Utilization & Storage (CCUS)*** *Principles and Technologies of CCUS • Large-Scale CCUS Projects in the Oil and Gas Industry • Cost and Efficiency Considerations • Future of CCUS in Achieving Net-Zero Emissions*
1330 – 1420	***Methane Emission Reduction Strategies*** *Identifying Methane Leakages in Oil and Gas Operations • Technologies for Methane Detection and Measurement • Best Practices for Methane Reduction • Regulatory Requirements for Methane Emission Controls*
1420 – 1430	***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*
1430	*Lunch & End of Day Three*

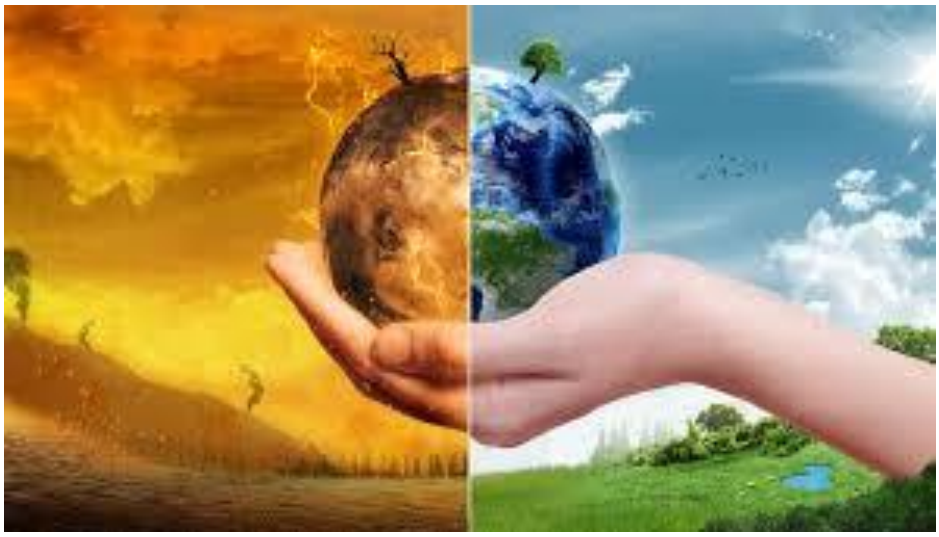
Day 4

0730 – 0830	***Renewable Energy Integration in Petroleum Sector*** *Solar and Wind Energy in Oil Production Sites • Offshore Renewable Energy and Hybrid Solutions • Role of Biofuels and Alternative Energy Sources • Renewable Energy Initiatives*
0830 – 0930	***Hydrogen Economy & the Future of Oil*** *Hydrogen Production (Green, Blue, Grey) • Role of Hydrogen in Decarbonizing Oil and Gas Operations • Challenges in Hydrogen Storage and Transport • Potential for Hydrogen Investments*
0930 – 0945	*Break*
0945 – 1100	***Role of Digitalization in Climate Mitigation*** *AI and Machine Learning for Climate Prediction • Blockchain for Carbon Accounting and Trading • IoT Sensors for Real-Time Emission Monitoring • Automation for Reducing Operational Energy Consumption*
1100 – 1130	***Climate Finance & Carbon Markets*** *Understanding Carbon Pricing and Cap-and-Trade Mechanisms • Role of Carbon Offsetting in Oil and Gas Industry • Green Bonds and Sustainable Investment Strategies • Climate-Related Financial Disclosures*
1130 - 1230	***Future Climate Scenarios & Projections*** *RCP and SSP Scenarios for Global Warming • Climate Tipping Points and Their Economic Implications • Predicting Climate Change Impact on Oil Markets • Planning for a Low-Carbon Future*
1230 – 1245	*Break*
1245 – 1300	***ESG & Sustainability*** *Environmental, Social and Governance (ESG) Criteria • Measuring and Reporting Carbon Footprint • Sustainability Goals and Long-Term Business Strategy • Stakeholder Engagement in Climate Action*

1300 - 1330	***Building a Climate Action Roadmap*** *Identifying Key Risks and Opportunities • Developing Industry-Specific Mitigation Strategies • Setting Measurable Climate Goals • Implementing Monitoring and Reporting Mechanisms*
1330 – 1345	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-



Course Coordinator

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