COURSE OVERVIEW DE0528

GeoTechnical Survey and Data Analysis

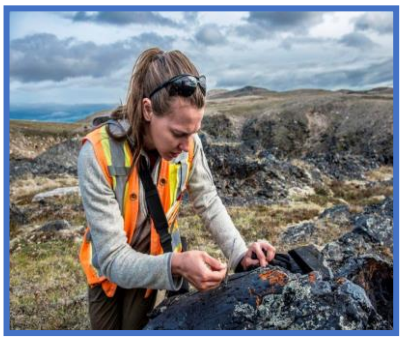
Course Title
GeoTechnical Survey and Data Analysis

Course Date/Venue
Session 1: April 13-17, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
Session 2: September 15-19, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
DE0528

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description



This practical and highly-interactive course includes real-life case studies and exercises 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 GeoTechnical Survey and Data Analysis. It covers the scope of geotechnical engineering and the importance of geotechnical surveys in construction; the soil formation processes, soil types and properties and the significance of soil classification in geotechnical analysis; the field exploration techniques and the tools and equipment used in geotechnical survey; the subsurface conditions assessment, geotechnical reporting essentials and laboratory testing of soils; the shear strength testing, soil permeability and hydraulic conductivity; the rock mechanics and classification; and the in-situ testing methods, data acquisition and management.

During this interactive course, participants will learn the soil-structure interaction, slope stability analysis and ground improvement techniques; the seismic geotechnical analysis, foundation design principles and numerical modeling in geotechnical analysis; the geotechnical hazards identification and groundwater and drainage control; the pavement subgrade and embankment design and geotechnical considerations in urban development; the project integration and collaboration, quality assurance in geotechnical surveys and geotechnical survey planning; the data visualization and reporting; and the environmental and legal considerations.

Course Objectives

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

- Apply and gain an in-depth knowledge on geotechnical survey and data analysis
- Discuss the scope of geotechnical engineering and the importance of geotechnical surveys in construction
- Identify soil formation processes, soil types and properties and the significance of soil classification in geotechnical analysis
- Apply field exploration techniques and identify the tools and equipment used in geotechnical survey
- Assess subsurface conditions and apply geotechnical reporting essentials and laboratory testing of soils
- Carryout shear strength testing, soil permeability and hydraulic conductivity
- Describe rock mechanics and classification and apply in-situ testing methods, data acquisition and management
- Employ soil-structure interaction, slope stability analysis and ground improvement techniques
- Apply seismic geotechnical analysis, foundation design principles and numerical modeling in geotechnical analysis
- Carryout geotechnical hazards identification and groundwater and drainage control
- Illustrate pavement subgrade and embankment design and identify geotechnical considerations in urban development
- Implement project integration and collaboration, quality assurance in geotechnical surveys and geotechnical survey planning
- Apply data visualization and reporting as well as discuss environmental and legal considerations

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 geotechnical survey and data analysis for geotechnical engineers, civil engineers, environmental engineers, construction managers, surveyors, geologists, students and researchers, project managers and those who involved in or interested in fields related to geotechnical engineering, construction, and environmental science.

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 **3.0 CEUs** (Continuing Education Units) or **30 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:

Dr. John Petrus, PhD, MSc, BSc, is a **Senior Drilling Engineer & Geologist** with over **30 years** of **onshore & offshore** experience within the **Oil & Gas**, **Refinery** and **Petroleum** industries. His wide experience covers in the areas of **Production Technology** & Engineering, **Well Completions**, **Well Logs**, **Well Stimulation** & **Production Logging**, **Well Completion** Design & Operation, **Well** Surveillance, **Well Testing**, **Well Stimulation** & Control and **Workover** Planning, **Horizontal & Multilateral Wells**, **Completions & Workover**, Hole Cleaning & Logging, **Drilling & Work-Over** Operations, **Drill String Design & Drilling** Optimization, **Wellhead** Operations, Maintenance & Testing, Petrophysics/Interpretation of Well Composite, **Reservoir & Tubing** Performance, Practical **Reservoir** Engineering, Clastic **Exploration & Reservoir Sedimentology**, **Carbonate Reservoir Characterization** & Modeling, **Seismic Interpretation**, **Mapping & Reservoir** Modelling, **Reservoir Geology**, Integrating **Geoscience** into **Carbonate Reservoir** Management, **Faulted & Fractured Reservoirs**, **Fractured Hydrocarbon Reservoirs**, Analyses, Characterisation & Modelling of **Fractured Reservoirs & Prospects**, **Fracture Reservoir** Modeling Using **Petrel**, **Reservoir** Engineering Applied Research, **Artificial PVTLift**, **Artificial Lift System** Selection & Design, Fluid Properties & Phase Behavior (**PVT**), Electrical Submersible Pumps (**ESP**), Enhance Oil Recovery (**EOR**), **Oil In Place** (**OIP**) **Estimation & Range of Uncertainty**, **Hydraulic Fracturing**, **Sand Control** Techniques, **Perforating** Methods & Design, **Perforating** Operations, **Petroleum** Exploration & Production, **Hydrocarbon Exploration** & Production, Exploration & Production, **Play Assessment & Prospect Evaluation**, **Formation** Evaluation, **Petroleum Engineering** Practices, **Petroleum** Hydrogeology & Hydrodynamics, **Project** Uncertainty, Decision Analysis & Risk Management, **Decision Analysis & Uncertainty** Management, **Exploration & Development Geology**, **Sedimentology & Sequence Stratigraphy**, **Structural Interpretation** in Exploration & Development, **Petrel Geology**, **Geomodeling**, **Structural Geology**, **Applied Structural Geology** in Hydrocarbon Exploration, **Petrophysics**, **Geology** of the Oil & Gas Field, **Geophysics**, **Geothermal**, **Geochemical & Geo-Engineering** and Drilling Applied Research, Field Geological Outcrop Mapping & Digital Cartography, **Geological** Modelling, **Geoscience** Management in E&P, Geoscience Modelling, Geological Mapping, **Structural Geology-Tectonics**, **Structural** Analysis, **Tectonic Modelling** and Numerical Simulation of **Fractured Prospects & Reservoirs**, **Fracture Network** Analysis & Modelling, **Prospect** Generation, Global Networking, Research and Technology Development Management for **Fault & Fracture Analyses** & Modelling, **Fracture** Modelling, **Dynamic** Modelling, **Field Development** Planning, **Water Injection** Planning, Stereophotogrammetry, Fault Mapping, GPS Survey, 2D & 3D **Seismic Acquisition** & Processing, **3D Seismic** Surveys & Mapping, 3D GIS, GMAP, **Sandbox** Modelling, Sedimentological Logging, GR Logging, Surface & Subsurface 3D Modelling, Best Practices Management System (**BPMS**), Subsurface Work for Energy Projects, Digitalization Projects, **Structural Model** using **Petrel**, G&G Seismic & Well **Data** Modelling, **GIS System** Management, **Database** Management, Strategic Planning, Best Practices and Workflow, **Quality** Management, **Project** Management and **Risk Assessment** & Uncertainty Evaluation. Further, he is also well-versed in **seismic interpretation**, **mapping** & **reservoir modelling tools** like **Petrel** software, **LandMark**, **Seisworks**, **Geoframe**, **Zmap** and has extensive knowledge in MSDos, Unix, **AutoCAD**, MAP, Overlay, Quicksurf, 3DStudio, **Esri ArcGIS**, Visual Lisp, Fortran-77 and Clipper. Moreover, he is a world **expert** in **analysis** and **modelling** of **fractured prospects** and **reservoirs** and a **specialist** and **developer** of **fracture modelling software tools** such as FPDM, FMX and DMX Protocols.

During his career life, Dr. Petrus held significant positions and dedication as the **Executive Director**, **Senior Geoscience Advisor**, **Exploration Manager**, **Project Manager**, **Manager**, **Chief Geologist**, **Chief** of **Exploration**, **Chief** of **Geoscience**, **Senior Geosciences Engineer**, **Drilling Engineer**, **Reservoir Engineer**, **Senior Explorationist**, **Senior Geologist**, **Geologist**, **Senior Geoscientist**, **Geomodeller**, **Geoscientist**, **CPR Editor**, **Resources Auditor**, **Project Leader**, **Technical Leader**, **Team Leader**, **Scientific Researcher** and **Senior Instructor/Trainer** from various international companies and universities such as the Dragon Oil Holding Plc., ENOC, MENA, ENI Group of Companies, Ocre Geoscience Services (OGS), Burren RPL, Ministry of Oil-Iraq, Eni Corporate University, Standford University, European Universities, European Research Institutes, NorskHydro Oil Company, Oil E&P Companies, just to name a few.

Dr. Petrus has a **PhD** in **Geology** and **Tectonophysics** and **Master**'**s** and **Bachelor**'**s** degree in **Earth Sciences** from the **Utrecht University**, **The Netherlands**. Further, he is a **Certified Instructor/Trainer**, a **Certified Trainer/Assessor/Internal Verifier** by the **Institute of Leadership & Management** (**ILM**), a Secretary and Treasurer of Board of Directors of Multicultural Centre, Association Steunfonds SSH/SSR and Founding Member of Sfera Association. He has further published several scientific publications, journals, research papers and books and delivered numerous trainings, workshops, courses, seminars and conferences internationally.

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 Fee

US$ 8,000 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 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

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0900	***Introduction to Geotechnical Engineering*** *Definition & Scope of Geotechnical Engineering • Importance of Geotechnical Surveys in Construction • Role of Geotechnical Engineers • Overview of Soil & Rock Mechanics*
0900 – 0945	***Basics of Soil Formation & Classification*** *Soil Formation Processes • Soil Types & Properties • Unified Soil Classification System (USCS) • Significance of Soil Classification in Geotechnical Analysis*
0945 – 1000	*Break*
1000 – 1100	***Field Exploration Techniques*** *Objectives of Geotechnical Site Investigation • Surface Reconnaissance & Mapping • Techniques for Sampling (Disturbed & Undisturbed) • Role of Boreholes & Test Pits*
1100 – 1200	***Tools & Equipment Used in Geotechnical Survey*** *Borehole Drilling Rigs • Penetrometers & Field Test Equipment • Geophysical Survey Tools (Seismic & Resistivity) • GPS & GIS Tools in Geotechnical Applications*

1200 – 1215	Break
1215 – 1315	***Basics of Subsurface Conditions*** *Understanding Groundwater Levels • Soil Stratification & Profiling • Influence of Weathering on Subsurface Materials • Implications of Subsurface Conditions in Design*
1315 – 1420	***Geotechnical Reporting Essentials*** *Components of a Geotechnical Report • Importance of Preliminary Data Analysis • Visual Representation of Soil Layers (Logs & Profiles) • Common Challenges in Report Preparation*
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	***Laboratory Testing of Soils*** *Sieve Analysis & Grain Size Distribution • Atterberg Limits (Liquid & Plastic Limits) • Compaction Tests (Proctor Test) • Moisture Content Determination*
0830 – 0945	***Shear Strength Testing*** *Triaxial Shear Test • Direct Shear Test • Unconfined Compression Test • Interpretation of Shear Strength Results*
0945 – 1000	*Break*
1000 – 1100	***Soil Permeability & Hydraulic Conductivity*** *Darcy's Law & its Applications • Permeability Testing Methods (Constant & Falling Head) • Factors Affecting Soil Permeability • Importance of Permeability in Foundation Design*
1100 – 1200	***Rock Mechanics & Classification*** *Rock Mass Characterization (RMR & Q-System) • Uniaxial Compressive Strength of Rocks • Point Load Test for Rock Classification • Fracture & Joint Analysis in Rock Masses*
1200 – 1215	*Break*
1215 – 1345	***In-situ Testing Methods*** *Standard Penetration Test (SPT) • Cone Penetration Test (CPT) • Plate Load Test • Pressuremeter Test*
1345 - 1420	***Data Acquisition & Management*** *Tools for Data Logging in Field Tests • Data Quality Control & Assurance • Handling Inconsistencies in Collected Data • Archiving Field Data for Future Analysis*
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	***Soil-Structure Interaction*** *Fundamentals of Soil-Structure Interaction • Bearing Capacity & Settlement Analysis • Foundation Types & their Behavior • Load Transfer Mechanisms in Soil*
0830 – 0945	***Slope Stability Analysis*** *Factors Influencing Slope Stability • Methods of Slope Stability Assessment (Limit Equilibrium, FEM) • Monitoring Techniques for Slopes • Mitigation Measures for Unstable Slopes*
0945 – 1000	*Break*
1000 – 1100	***Ground Improvement Techniques*** *Methods of Soil Stabilization (Chemical & Mechanical) • Use of Geosynthetics in Soil Improvement • Preloading & Dewatering Techniques • Vibro-Compaction & Stone Columns*
1100 – 1200	***Seismic Geotechnical Analysis*** *Impact of Earthquakes on Soil & Foundation Systems • Liquefaction Analysis & Mitigation • Dynamic Soil Properties & Response Spectra • Ground Motion Amplification in Geotechnical Design*
1200 – 1215	*Break*
1215 – 1345	***Foundation Design Principles*** *Shallow Foundations: Footing & Raft Design • Deep Foundations: Pile & Caisson Design • Load & Resistance Factor Design (LRFD) • Effects of Lateral & Uplift Loads on Foundations*
1345 - 1420	***Numerical Modeling in Geotechnical Analysis*** *Introduction to Finite Element Analysis (FEA) • Common Software Tools (PLAXIS, GeoStudio, ABAQUS) • Setting up Numerical Models • Calibration & Validation of Models*
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	***Geotechnical Hazards Identification*** *Common Geotechnical Risks (Landslides, Sinkholes, etc.) • Hazard Assessment Techniques • Early Warning Systems for Geotechnical Risks • Mitigation & Management Strategies*
0830 – 0945	***Groundwater & Drainage Control*** *Effects of Groundwater on Geotechnical Systems • Drainage Techniques in Construction • Dewatering Methods & Equipment • Groundwater Monitoring During Construction*
0945 – 1000	*Break*
1000 – 1100	***Pavement Subgrade & Embankment Design*** *Characteristics of a Good Subgrade • CBR (California Bearing Ratio) Testing • Embankment Stability & Settlement • Role of Geosynthetics in Pavement Design*
1100 – 1200	***Geotechnical Considerations in Urban Development*** *Challenges in Urban Geotechnical Projects • Impact of Underground Utilities on Soil Properties • Urban Excavation & Tunneling Challenges • Case Studies of Urban Geotechnical Failures*

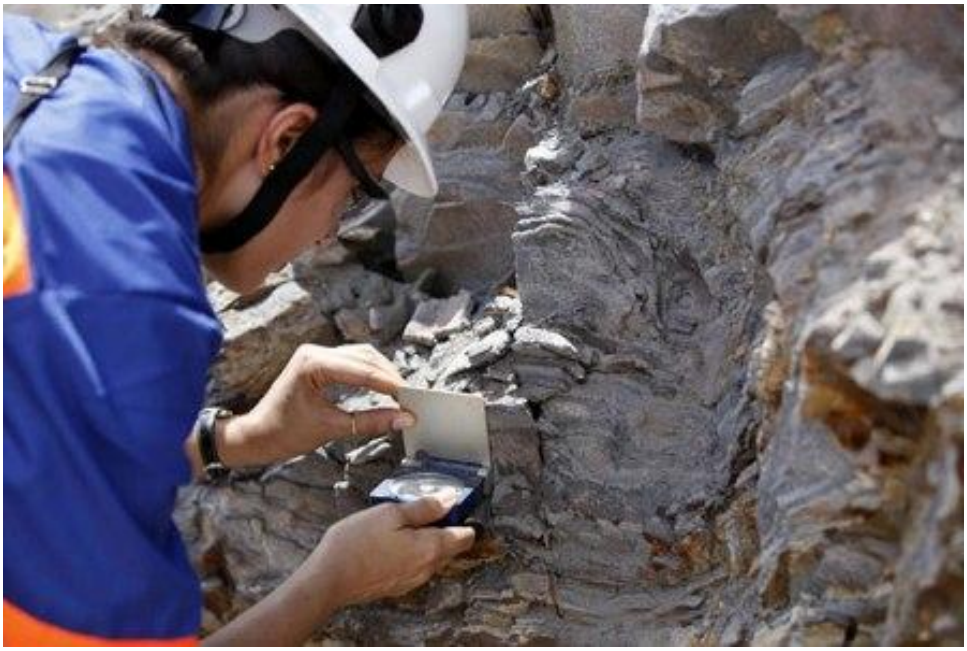
1200 – 1215	*Break*
1215 – 1345	***Project Integration & Collaboration*** *Communication Between Geotechnical & Structural Teams • Importance of Geotechnical Input in Project Planning • Addressing Geotechnical Challenges in Multidisciplinary Projects • Case Studies on Collaborative Problem-Solving*
1345 - 1420	***Quality Assurance in Geotechnical Surveys*** *Standards & Codes in Geotechnical Investigations • Ensuring Consistency in Field & Lab Results • Peer Review & Validation Processes • Importance of Ethical Practices in Geotechnical Projects*
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 Four*

Day 5

0730 – 0830	***Geotechnical Survey Planning*** *Site Selection Criteria for Investigations • Budgeting & Resource Allocation for Surveys • Scheduling & Logistics for Geotechnical Surveys • Risk Management in Survey Planning*
0830 – 0945	***Case Studies of Geotechnical Failures*** *Analysis of Well-Known Failures (e.g., Dam Collapses, Slope Failures) • Lessons Learned from Geotechnical Disasters • Preventative Measures for Future Projects • Role of Monitoring in Early Failure Detection*
0945 – 1000	*Break*
1000 – 1100	***Data Visualization & Reporting*** *Tools for Geotechnical Data Visualization (e.g., GIS, AutoCAD) • Creating Soil Profiles & Cross-Sections • Interpreting & Presenting Data to Stakeholders • Effective Use of Charts & Graphs in Reporting*
1100 – 1200	***Environmental & Legal Considerations*** *Environmental Impact of Geotechnical Activities • Regulations Governing Geotechnical Projects • Sustainable Practices in Geotechnical Engineering • Permitting & Compliance Requirements*
1200 – 1215	*Break*
1215 – 1315	***Future Trends in Geotechnical Engineering*** *Role of AI & Machine Learning in Data Analysis • Advances in Geotechnical Monitoring Tools • Use of Remote Sensing in Subsurface Investigations • Emerging Techniques in Soil & Rock Testing*
1345 - 1400	***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 highly-interactive course includes real-life case studies and exercises:-



Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org