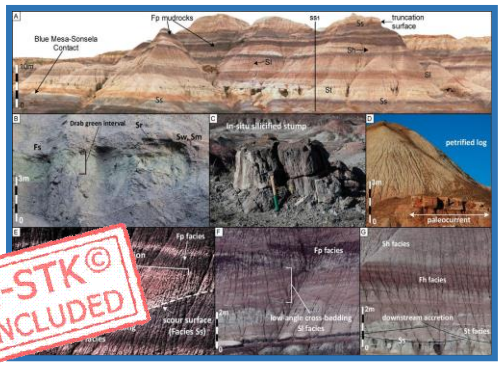
COURSE OVERVIEW DE0444
MICP & Deterministic Rock Typing



Course Title
MICP & Deterministic Rock Typing

Course Reference
DE0444

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

Course Date/Venue

Session(s)	Date	Venue
1	May 20-24, 2024	Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE or, Online Virtual Training
2	August 18-22, 2024	Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE or, Online Virtual Training
3	September 15-19, 2024	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE or, Online Virtual Training
4	November 17-21, 2024	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE or, Online Virtual Training

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 MICP & Deterministic Rock Typing. It covers the basic principles of microbial induced carbonate precipitation and the importance of rock typing in reservoir characterization; the geological settings where MICP can be applied and the rock types involved; the microbial metabolic processes that lead to carbonate precipitation; and the fundamentals of petrophysics and the applications of MICP and rock typing.

Further, the course will also discuss the types of microorganisms involved including their selection and engineering; the detailed study of biochemical reactions leading to carbonate precipitation; the environmental factors affecting MICP covering pH, temperature and other environmental parameters that influence MICP; the techniques for cultivating microorganisms and inducing precipitation in lab settings; and monitoring and measuring MICP and the different deterministic rock typing methods.

During this interactive course, participants will learn the textural and compositional analysis, petrophysical classifications, petrographic microscopy techniques and statistical methods in rock typing; integrating rock typing with seismic and other geophysical data for enhanced reservoir characterization; the challenges and strategies in scaling MICP from lab to field; the computational models used to simulate MICP processes and predict outcomes; the engineering applications of MICP including bioreactor design, economic and sustainability considerations and current research and technological advances; the reservoir modeling using rock typing; the rock typing in carbonate and clastic reservoirs; and the advanced imaging techniques, future trends in rock typing technology and workflow integration and project management.

Course Objectives

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

- Apply and gain an in-depth knowledge on MICP and deterministic rock typing
- Discuss the basic principles of microbial induced carbonate precipitation and the importance of rock typing in reservoir characterization
- Explain the geological settings where MICP can be applied and rock types involved
- Describe the microbial metabolic processes that lead to carbonate precipitation
- Discuss the fundamentals of petrophysics and the applications of MICP and rock typing
- Identify the types of microorganisms involved, their selection and engineering and the detailed study of biochemical reactions leading to carbonate precipitation
- Recognize the environmental factors affecting MICP covering pH, temperature and other environmental parameters that influence MICP
- Carryout techniques for cultivating microorganisms and inducing precipitation in lab settings
- Monitor and measure MICP and explore different deterministic rock typing methods
- Apply textural and compositional analysis, petrophysical classifications, petrographic microscopy techniques and statistical methods in rock typing
- Integrate rock typing with seismic and other geophysical data for enhanced reservoir characterization
- Recognize the challenges and strategies in scaling MICP from lab to field as well as computational models used to simulate MICP processes and predict outcomes
- Determine engineering applications of MICP including bioreactor design, economic and sustainability considerations and current research and technological advances
- Illustrate reservoir modeling using rock typing and identify rock typing in carbonate and clastic reservoirs
- Carryout advanced imaging techniques, future trends in rock typing technology and workflow integration and project management

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, sample video clips of the instructor's actual lectures & practical sessions during the course conveniently saved in a **Tablet PC.***

Who Should Attend

This course provides an overview of all significant aspects and considerations of MICP and deterministic rock typing for senior production engineers, petroleum engineers, reservoir and field engineers and other technical staff.

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

Virtual Training (If Applicable)

If this course is delivered online as a Virtual Training, the following limitations will be applicable:-

Certificates	Only soft copy certificates will be issued to participants through Haward's Portal. This includes Wallet Card Certificates if applicable
Training Materials	Only soft copy Training Materials (PDF format) will be issued to participant through the Virtual Training Platform
Training Methodology	80% of the program will be theory and 20% will be practical sessions, exercises, case studies, simulators or videos
Training Program	The training will be for 4 hours per day starting at 0930 and ending at 1330
H-STK Smart Training Kit	Not Applicable
Hands-on Practical Workshops	Not Applicable
Site Visit	Not Applicable
Simulators	Only software simulators will be used in the virtual courses. Hardware simulators are not applicable and will not be used in Virtual Training

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: -

- 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.

- 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.

Accommodation

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

Course Instructor

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

Mr. Stan Constantino, MSc, BSc, is a **Senior Petroleum & Reservoir Engineer** with over **35 years** of **Offshore & Onshore** extensive experience within the **Oil**, **Gas & Petroleum** industries**.** His area of expertise include **Geology** & **Mineralogy**, **Microbial Processes** in **MICP**, **Rock Typing**, **Petrophysics & Rock** Properties, **Reserves & Resources**, **Reserves Estimation & Uncertainty**, **Reservoir** Characterization, **Unconventiona**l **Resource & Reserves** Evaluation, **Oil & Gas Reserves** Estimation, Methods for **Aggregation of Reserves & Resources**, **Fractured Reservoir** Classification & Evaluation, **Sequence Stratigraphy**, **Seismic** Technology, **Geological** Modelling, **Water Saturation**, **Crude Oil & Natural Gas** Demand, **Exploration Agreements & Financial** Modelling, **Seismic Survey** Evaluation, **Exploration Well** Identification, **Field Production** Operation, **Field Development** Evaluation, Crude Oil Marketing, **Core & Log Data** Integration, **Core Logging**, Advanced **Core & Log Integration**, **Well Logs & Core Analysis**, Advanced Petrophysics/Interpretation of **Cased Hole Logs**, **Cased Hole Formation Evaluation**, **Cased Hole Formation** Evaluation, **Cased Hole Evaluation**, **Cased-Hole Logging**, Applied **Production Logging & Cased Hole & Production Log** Evaluation, **Cased Hole Logging & Formation** Evaluation, Open & Cased Hole Logging, Screening of Oil Reservoirs for **Enhanced Oil Recovery**, **Enhanced Oil Recovery**, **Enhanced Oil Recovery** Techniques, **Petroleum Economic** Analysis, **Oil Industry** Orientation, **Oil Production & Refining**, **Crude Oil Market**, **Global Oil Supply & Demand**, **Global Oil Reserves**, **Crude Oil** Types & Specifications, **Oil Processing**, **Oil Transportation-Methods**, **Oil & Gas** Exploration and Methods, **Oil & Gas** Extraction, Technology Usage in Industrial Security; **Upstream**, **Midstream** & **Downstream Operations**; **Oil Reservoir** Evaluation & Estimation, **Oil Supply & Demand**, **Oil Contracts**, **Government Legislation & Oil Contractual Agreements**, **Oil Projects** & Their Feasibility (revenue and profitability), **Water Flooding**, **Reservoir** Souring & Water Breakthrough, **Reservoir Performance** Using Classical Methods, **Fractured Reservoir** Evaluation & Management, **Reservoir Surveillance** & Management, **Reservoir Engineering** & Simulation, **Reservoir Monitoring**, **Pressure Transient** Testing & **Reservoir** Performance Evaluation, **Reservoir** Characterization, **Reservoir** Engineering Applications with ESP and Heavy Oil, **Reservoir** Volumetrics, Water Drive Reservoir, **Reserve** Evaluation, Rock & Fluid Properties, Fluid Flow Mechanics, PVT Analysis, Material Balance, Darcy's Law & Applications, Radial Flow, **Gas Well** Testing, Natural Water Influx, EOR Methods, Directional Drilling, **Drilling** Production & Operations, Field Development & Production of Oil & Gas, **Wireline Logging**, **Mud Logging**, **Cased Hole Logging**, **Production Logging**, **Slick Line**, **Coil Tubing**, Exploration Wells Evaluation, **Horizontal Wells**, **Well Surveillance**, **Well Testing**, **Design & Analysis**, **Well Testing & Oil Well Performance**, **Well Workover Supervision**, **Pressure Transient Analysis** and **Petrophysical Log Analysis**. Currently, he is the **CEO** & **Managing Director** of **Geo Resources Technology** wherein he is responsible in managing the services and providing technical supports to underground energy related projects concerning **field development**, **production**, **drilling**, **reservoir engineering** and **simulation**.

Throughout his long career life, Mr. Stan has worked for many international companies such as the **Kavala Oil**, **North Aegean Petroleum Company** and **Texaco Inc.**, as the **Managing Director**, **Operations Manager**, **Technical Trainer**, **Training Consultant**, **Petroleum Engineering & Exploration Department Head**, **Assistant Chief Petroleum Engineer**, **Reservoir Engineer, Resident Petroleum Engineer**, **Senior Petroleum Engineer** and **Petroleum Engineer** wherein he has been managing the evaluation of exploration wells, reservoir simulation, development training, production monitoring, wireline logging and well testing including selection and field application of well completion methods.

Mr. Stan has a **Master's** degree in **Petroleum Engineering** and a **Bachelor's** degree in **Geology** from the **New Mexico Institute of Mining & Technology** (**USA**) and from the **Aristotelian University** (**Greece**) respectively. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership of Management (ILM**) and a member of the Society of Petroleum Engineers, USA (**SPE**), Society of Well Log Professional Analysts, USA (**SPWLA**) and European Association of Petroleum Geoscientists & Engineers (**EAGE**). Moreover, Mr. Stan published numerous scientific and technical papers and delivered various trainings, courses and workshops worldwide.

Course Fee

F2F Classroom: **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.

Online Virtual: **US$ 4,000** per Delegate + **VAT**.

Course Program

The following program is planned for this course. However, the course instructor 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 - 0930	***Overview of MICP:*** *Definition, Historical Context & Basic Principles of Microbial Induced Carbonate Precipitation*
0930 – 0945	*Break*
0945 – 1030	***Introduction to Rock Typing****: What is Rock Typing? Importance in Reservoir Characterization*
1030 - 1115	***Basic Geology & Mineralogy:*** *Understanding the Geological Settings Where MICP Can Be Applied & Rock Types Involved*
1115 – 1230	***Microbial Processes in MICP:*** *Overview of the Microbial Metabolic Processes that Lead to Carbonate Precipitation*
1230 – 1245	*Break*
1245 – 1330	***Fundamentals of Petrophysics:*** *Introduction to Petrophysical Properties Influencing Rock Typing*
1330 – 1420	***Applications of MICP & Rock Typing:*** *An Initial Look at Practical Applications in Environmental Engineering & Reservoir Management*
1420 - 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Microorganisms & MICP:*** *Types of Microorganisms Involved, their Selection & Engineering*
0830 – 0930	***Biochemical Pathways in MICP:*** *Detailed Study of Biochemical Reactions Leading to Carbonate Precipitation*
0930 – 0945	*Break*
0945 – 1100	***Environmental Factors Affecting MICP:*** *pH, Temperature & Other Environmental Parameters that Influence MICP*
1100 – 1230	***Laboratory Methods for MICP:*** *Techniques for Cultivating Microorganisms & Inducing Precipitation in Lab Settings*
1230 – 1245	*Break*
1245 – 1330	***Monitoring & Measuring MICP:*** *Tools & Techniques for Monitoring MICP Processes & Outcomes*
1330 – 1420	***Case Studies of MICP Applications:*** *Examples from Environmental Remediation & Geological Stabilization*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Rock Typing Methodologies:*** *Detailed Exploration of Different Deterministic Rock Typing Methods*
0830 – 0930	***Textural & Compositional Analysis:*** *How Textures & Compositions Affect Rock Properties & Classification*
0930 – 0945	*Break*
0945 – 1100	***Petrophysical Classifications:*** *Understanding how Petrophysical Properties are Used to Define Rock Types*
1100 – 1230	***Use of Petrographic Microscopy:*** *Techniques in Thin Section Analysis for Rock Typing*
1230 – 1245	*Break*
1245 – 1330	***Statistical Methods in Rock Typing****: Application of Statistical Analysis to Group & Classify Rock Data*
1330 – 1420	***Integration with Geophysical Data:*** *How Rock Typing Data Is Integrated with Seismic & Other Geophysical Data for Enhanced Reservoir Characterization*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0830	***Scale-Up of MICP****: Challenges & Strategies in Scaling MICP from Lab to Field*
0830 – 0930	***Modeling MICP Reactions:*** *Computational Models Used to Simulate MICP Processes & Predict Outcomes*
0930 – 0945	*Break*
0945 – 1100	***Engineering Applications of MICP****: Use in Civil Engineering for Concrete Repair, Soil Stabilization etc.*
1100 – 1230	***Bioreactor Design for MICP****: Design & Operation of Bioreactors for Efficient Carbonate Precipitation*
1230 – 1245	*Break*
1245 – 1330	***Economic & Sustainability Considerations in MICP****: Analyzing the Cost-Effectiveness & Environmental Impact of MICP*
1330 – 1420	***Current Research & Technological Advances in MICP:*** *Latest Developments & Future Directions in MICP Technology*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0830	***Reservoir Modeling Using Rock Typing:*** *How Deterministic Rock Typing Informs Reservoir Modeling & Simulation*
0830 – 0930	***Rock Typing in Carbonate & Clastic Reservoirs:*** *Specific Challenges & Strategies in Different Reservoir Types*
0930 – 0945	*Break*
0945 – 1100	***Advanced Imaging Techniques:*** *Latest Advancements in Imaging for Rock Typing, including CT Scans & MRI*
1100 – 1230	***Future Trends in Rock Typing Technology:*** *New Technologies & Approaches on the Horizon*
1230 – 1245	*Break*
1245 - 1345	***Workflow Integration & Project Management:*** *Best Practices for Integrating Rock Typing into Broader Geological Studies & Projects*
1345 – 1400	***Course Conclusion***
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