NEW Training Courses

African Minerals and Geosciences Centre (AMGC) is pleased to announce the introduction of four new courses on Geostatistics, Petroleum Sciences and Resource Estimation in collaboration with Khartoum based Consulting firm called **Knowledge and Training Centre (KTC).** The course shall be facilitated by the Director of KTC, Dr. M. Zayed Awad, an eminent specialist in the areas of geostatistics, resource evaluation, stratigraphy, reporting, training and mentoring, risk and decision analysis, petroleum economics, project management. The training course will be organized in Dar es Salaam at the AMGC training facilities. The following training courses are going to be offered through this collaboration.

1. **Fundamental of Petroleum Economics**
   Duration: One Week
   Course fee: US$ 1,200

This course introduces the participants to requirements for conducting petroleum economics; different stages of the petroleum industry life cycle involving upstream, mid-stream and downstream sectors will be explained. Participants will learn how to construct a Cash Flow Model for oil and gas investment decision. they will also learn how to deal with the different financial components of petroleum cost, and classification of costs into OPEX and CAPEX. Net Cash Flow Stream analysis and computation of economic indicators (Yardsticks) such as NPV, IRR, PBP, MCE and DPI, and their interpretations are essential for petroleum investment decision-making. Cash Flow Adjustment using discount rates is also considered. Types of fiscal regimes will be explained, participant will also learn how to incorporate the fiscal parameters into a cash flow stream.

2. **Geostatistical Mineral Resource Estimation**
   Duration: One Week
   Course fee: US$ 1,700

The course will focus on the fundamentals of Geostatistical application in mining that are required for domain specification that are required for mineral resource estimation and will include hands-on training with Geostatistical software. Geostatistical conditional Simulations may be used to assess the uncertainty associated with the Reserves Evaluation at exploration, feasibility, and production stages. The simulations provide a range of potential reserves for the ore body's Tonnage, Metal Quantity and Recovered Grade.

3. Introduction to Oil and Gas Industry
DURATION: One Week
Course fee: US$ 1,200

This course is designed for a wide-ranging of petroleum industry personnel. It is designed to provide green-hands technical, and a non-technical personnel with practical petroleum industry life cycle. The course covers the key phases of the exploration, development and production industry as well as transportation and refining of crudes oils.

4. Geostatistics for Mining - foundation Course
Duration: Two Weeks
Course fee: US$ 2,000

Geostatistics, in combination with other statistical methods, offers a wide range of mathematical tools that can be used to analyze, model, provide estimates and assess uncertainties, for different types of spatial phenomena, for example, grades or geological features. The course will focus on the fundamentals of geostatistics and statistics and will include hands-on training with Geostatistical software.

5. Prospect Evaluation: Volumetric and Risk Analysis
Duration: Two weeks
Course fees: US$ 2,000

A decision to drill an exploration well with the objective of finding a new oil or gas field must be based on a sound assessment of the prospect's risks and of the volumes. A risk and volume assessment is therefore a decision tool. This course explains how risks and volumes can be assessed in a robust manner, based on a sound understanding of probability and the geological details of the prospect as well as of its regional setting. Fundamentals of risk and volume assessment will be presented. Participants will also be acquainted with the interplay of basins, petroleum systems and exploration plays concept. Software will be used for practicing.

THE INSTRUCTOR

Dr. M. Zayed Awad, the former Sudanese Minister for Oil and Gas (September 2014-May 2017) BSc (Hons) from University of Khartoum, Sudan, MSc (Geol) from Technical University of Berlin (TU), PhD (Stratigraphy) from Technical University of Berlin (TU). Dr. Zayed is a university instructor with postgraduate qualifications in petroleum geology, stratigraphy, economic geology, geostatistics, and relevant application softwares. He has more than 35 years' experience in university teaching and more than 25 years worldwide experience in the petroleum industry and training. He has supervised many MSc and PhD research students and reviewed several reports and research papers. He is the founder of Knowledge & Training Center (KTC) in Sudan, and he is active as a trainer since 2003. He worked on many projects and given training courses to hundreds of attendees on many aspects of geology. Dr. Zayed's skills are in geostatistics, resource evaluation, stratigraphy, reporting, training and mentoring, risk and decision analysis, petroleum economics, project management. Dr. Zayed was the initiator and editor-in-Chief of the book titled "Petroleum Geology and Resources of the Sudan" published by Geozone (Berlin) in 2015.

Fundamental of Petroleum Economics

Duration: One Week

Course fee: US$ 1,200

COURSE DESCRIPTION

This course introduces the participants to requirements for conducting petroleum economics; different stages of the petroleum industry life cycle involving upstream, mid-stream and downstream sectors will be explained. Participants will learn how to construct a Cash Flow Model for oil and gas investment decision. they will also learn how to deal with the different financial components of petroleum cost, and classification of costs into OPEX and CAPEX. Net Cash Flow Stream analysis and computation of economic indicators (Yardsticks) such as NPV, IRR, PBP, MCE and DPI, and their interpretations are essential for petroleum investment decision-making. Cash Flow Adjustment using discount rates is also considered. Types of fiscal regimes will be explained, participant will also learn how to incorporate the fiscal parameters into a cash flow stream.

GENERAL OBJECTIVES

After the Training, the participants are expected to able to:

- Understand petroleum project evaluation process flow
- Collect technical and financial data relevant to petroleum economic analysis
- Differentiate between the financial components of the costs (e.g. CAPEX & OPEX)
- Assess economic viability of a project or a prospect or a project
- Prioritize, rank and select projects or prospects for future investment
- Evaluate oil and gas investment profitability
- Negotiating a better deal of petroleum investment
- Contribute to strategic planning
- Design cash flow model using EXCEL spread sheet

WHO SHOULD ATTEND?

Geologists, Engineers, Economists, Accountants, Managers

NOTES:

This course had been delivered to over 200 Sudanese and Egyptian professionals since 2006.

Geostatistical Mineral Resource Estimation - Intermediate Course

Duration: One Week

Course fee: US$ 1,700

COURSE DESCRIPTION

The course will focus on the fundamentals of Geostatistical application in mining that are required for domain specification that are required for mineral resource estimation and will include hands-on training with Geostatistical software. Geostatistical conditional Simulations may be used to assess the uncertainty associated with the Reserves Evaluation at exploration, feasibility, and production stages. The simulations provide a range of potential reserves for the ore body's Tonnage, Metal Quantity and Recovered Grade.

COURSE CONTENTS

- Exploration Phases
- Mineral Resource Estimation Process (Assignment of domains)
- Data Processing and Analysis, and Database Validation
- Statistics and Exploratory Data Analysis (EDA), introduction to geostatistics.
- Domaining Process/ Boundaries Spatial analysis, variogram modeling and ordinary kriging.
- Reliability of the empirical variogram and kriging
- Mineral Resource estimation/ Tonnage computation
- Mineral Resources Categories and Classification using Geostatistics
- Resource Modeling and Estimation
- Measures of uncertainty using geostatistics
- Evaluation of the impact of Selective Mining Unit (SMU) dimensions on the Reserves
- Exercise with Geostat software & Microsoft Excel

WHO SHOULD ATTEND?

Geologists, Mainlining Engineers, mine managers and investors.

Introduction to Oil and Gas Industry

DURATION: One Week

Course fee: US$ 1,200

COURSE OVERVIEW

This course is designed for a wide-ranging of petroleum industry personnel. It is designed to provide green-hands technical, and a non-technical personnel with practical petroleum industry life cycle. The course covers the key phases of the exploration, development and production industry as well as transportation and refining of crudes oils.

Participants will be familiarized with:

- Historical background of petroleum industry, Petroleum terminology and Volumetric units
- Origin of petroleum, type of rocks relevant to a petroleum System
- The petroleum industry life-cycle.
- How International companies gain access to a land for investment
- Petroleum Industry Sectors
- Fundamental of petroleum accounting
- Fundamental of petroleum economics
- International petroleum contracts
- Renewable energy as future alternative to petroleum

WHO SHOULD ATTEND?

All those who would like be acquainted with the petroleum industry life cycle.

Geostatistics for Mining - foundation Course

Duration: Two Weeks

Course fee: US$ 2,000

COURSE DESCRIPTION

Geostatistics, in combination with other statistical methods, offers a wide range of mathematical tools that can be used to analyze, model, provide estimates and assess uncertainties, for different types of spatial phenomena, for example, grades or geological features. The course will focus on the fundamentals of geostatistics and statistics, and will include hands-on training with Geostatistical software.

COURSE CONTENTS

- Type and purpose of data
- Descriptive statistics & probabilities
- Univariate analysis (Histogram, Boxplot, Lineplot)
- Bivariate analysis (Scatterplot, Correlation and regression, Stereonet, Special scatterplots)
- Variography (Anisotropy, Building a variogram)
- Kriging Types and Applications
- Sequential simulation
- Stochastic Simulation and Applications
- Co-located co-simulation (When to use, How to do)
- Generation of maps and models using geochemical 2D and 3D data.
- Mining Applications At the Exploration / Pre-feasibility stage and feasibility stage
- Exercises with software

WHO SHOULD ATTEND?

Mining and Petroleum Geologists, Petroleum and Mainlining Engineers and environmentalists, groundwater geologists.

Prospect Evaluation: Volumetric and Risk Analysis

WITH APPLICATION SOFTWARE

Duration: Two weeks

Course fees: US$ 2,000

COURSE DESCRIPTION:

A decision to drill an exploration well with the objective of finding a new oil or gas field must be based on a sound assessment of the prospect's risks and of the volumes. A risk and volume assessment is therefore a decision tool. This course explains how risks and volumes can be assessed in a robust manner, based on a sound understanding of probability and the geological details of the prospect as well as of its regional setting. Fundamentals of risk and volume assessment will be presented. Participants will also be acquainted with the interplay of basins, petroleum systems and exploration plays concept. Software will be used for practicing.

COURSE CONTENTS:

After this course, participants would be able to assess Petroleum Resources and Probability of Discovery under uncertainty. They will learn:

- Understand and segregate the geologic risk factors of a prospect in a play
- The linkage between the probability rules and the prospect geologic factors
- Definition of the proven, probable and possible outcomes
- Application of probability models in volumetric estimation
- Quantification of volumetric parameters of an undrilled prospect
- Generation of resources profile as a continuous probability function
- Resource categorization, reconciliation and reporting
- Prioritization, ranking and selection of prospects
- Negotiate a better deal in licensing and bid rounds

WHO SHOULD ATTEND?

Petroleum geologist, geophysicists and reservoir engineers.