

**Delegates can claim 40 CPD with GSSA and SACNASP credits (it will attract 5 Category 1 credits)**



### Led by World Class Expert

Dr. Isobel Clark  
Bsc Msc DIC PhD FSS FIMMM FSAIMM FAusIMM  
Ceng MMSA(QP)  
Professional mining engineer with 40 years of experience  
Author of Practical Geostatistics (1979) and (2000)  
Director, Geostokos Limited, Scotland  
Former Professor in Camborne School of Mines,  
University of Exeter, England  
Former Professor, University of the Witwatersrand,  
Johannesburg  
11 years of lecturing at Royal School of Mines,  
London

**This 5-day course will consist of two parts.**

### Part 1 Practical Geostatistics Workshop

The first 3 days of the course will cover the practical aspect of Geostatistics. It will bring the delegates to in-depth understanding of the mysteries of ordinary kriging and its variants. This is a classroom course and includes manual exercises to reinforce understanding of the techniques. This workshop composed of lectures augmented by practical PC/laptop-based exercises covering many different applications. Case studies ranging from coal through base metals and iron ore to precious metals such as gold and platinum will be covered. All case studies are drawn from Dr Clark's extensive worldwide experience. Practical Geostatistics is aimed at any professionals dealing with the estimation from or interpolation between samples collected on a spatial basis. A minimum of mathematics is necessary to explain the techniques - mainly simple algebra, up to understanding the concepts behind solving simple sets of simultaneous equations and differentiating  $x^2$ . Questions and discussions are actively encouraged. Participants are advised to bring a laptop.

### Part 2 Mineral Resource Estimation

Participants in this Master Class are expected to be conversant with Geostatisticals procedures or at least completed Practical Geostatistics Workshop. Participants are invited to contribute discussion and ideas from their own practical experiences and to bring their own data for preliminary analysis during and after the workshop. The workshop is aimed at professionals who are interested in discussing the real world application of resource estimation techniques. Using little or no mathematics, Isobel Clark. This course will be an interactive and participative workshop where participants will be encouraged to discuss their own practice and compare it to others and recognised best practice. Real projects and case studies will form an important part of the workshop and participants will be encouraged to discuss and reflect on their own organisations practices and ways to improve them.

### Course Format

This course will be an interactive and participative workshop where participants will be encouraged to discuss their own practice and compare it to others and recognised best practice. Real projects and case studies will form an important part of the workshop and participants will be encouraged to discuss and reflect on their own organisations practices and ways to improve them.

### Who Should Attend But not limited to:

- ✓ Mining Geologists (Exploration, Production, Resource)
- ✓ Mining Engineer
- ✓ Mine Surveyors
- ✓ Geologist
- ✓ Geologist(Trainee)
- ✓ Mineral Resource Managers
- ✓ Resource Analysts
- ✓ Mine Managers
- ✓ Mine Supervisors
- ✓ Geophysicists
- ✓ Geochemist
- ✓ Geometallurgist
- ✓ Statisticians
- ✓ Database Managers
- ✓ MRM Practitioners
- ✓ Sampling Personnel
- ✓ Sampling Supervisors/Managers
- ✓ Metallurgist(Trainee)
- ✓ Mineral Resource Managers

# Practical Geostatistics & Mineral Resource Estimation Agenda

## Practical Geostatistics

### Session 1

- The basic assumptions of spatial estimation methods
- Inverse Distance interpolation methods

### Session 2

- Statistical Methods
- Classical statistics: the Normal distribution
- Confidence levels
- Standard errors

### Session 3

- Statistical Methods
- Construction and interpretation of semi-variograms
- Identification of trends
- Multi-component models
- Confirmation of basic assumptions
- Outliers

### Session 4

- Geostatistical Methods
- The experimental semi-variogram
- Modelling semi-variograms
- Trends
- Anisotropy
- Geological features

### Session 5

- Geostatistical Methods
- Ordinary Kriging
- Lognormal methods
- Indicator methods
- Regression problems (conditional bias)
- Simulation

## Mineral Resource Estimation

### Session 6

- Basic assumptions and requirements for mineral resource estimation
- Data validation, top-cuts and capping
- Construction, interpretation and modelling of semi-variograms
- Model validation and reconciliation with geological knowledge
- Geostatistical resource estimation, 3D and block modelling and Kriging
- Other Kriging techniques, such as MIK and Lognormal Kriging
- Geostatistical Simulations and Risk Assessment
- Grade control
- Drill hole spacing analysis

### Session 7

- Case Studies and BYO
- Construction and interpretation of semi-variograms
- Identification of trends confirmation of basic assumptions outliers

### Session 8

- Case Studies and BYO
- Choice of appropriate kriging techniques
- Practical applications of kriging

### Session 9

- Case Studies and BYO
- Discussion of case studies from course participants
- General discussion of case studies

## **BYO ' BRING YOUR OWN SESSIONS!!!**

**Get the trainer to address the concern you have in YOUR OWN projects! YOU can BRING and ANALYSE YOUR own data using Practical Geostatistics 2000 teaching software under the supervision of Dr. Isobel Clark. Take away copies of all software and data sets! You will be provided with a USB containing all relevant teaching materials. Latest E-Book on Practical Geostatistics and case studies included!!!**

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**HEAD OFFICE: 30 Hilltop Street Sandton View Office Park, Sandton, Telephone: +27 (0)11 025 7114**

<b>Event Name:</b>		<b>Practical Geostatistics &amp; Mineral Resource Estimation</b>		<b>6<sup>th</sup> – 10<sup>th</sup> November 2023</b>	
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