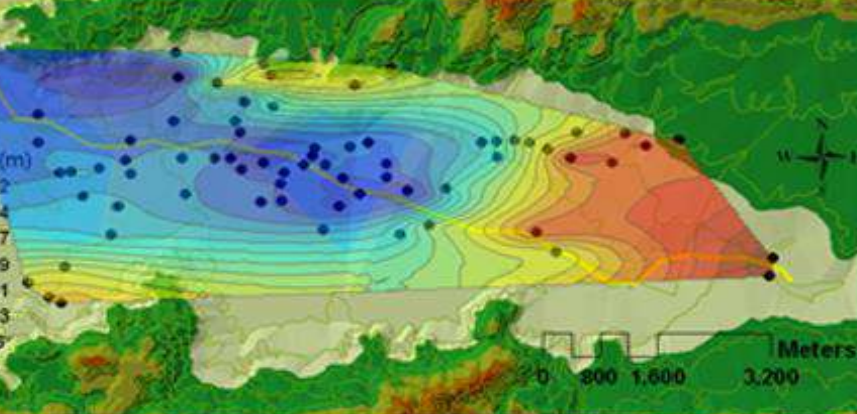




A World Class Training Provider



PRACTICAL GEOSTATISTICS & MINERAL RESOURCE ESTIMATION

5 DAY COURSE

12TH – 16TH NOVEMBER 2018 – OAKLANDS INN & CONFERENCE CENTRE

Comprehensive and up to date training course that will prepare and equip you with the necessary knowledge and techniques to accurately estimate and evaluate mineral resource based on practical methods that has been proven worldwide



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 Geostatistical 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 discusses casestudies involving interpretation of everyday questions, such as:

- Is my data homogeneous enough for geostatistical mapping?
- Do I have trends in my data and (if so) what kind?
- How do I interpret semi-variograms which deviate from the ideal shapes?
- What Kriging method should I use (if any)?
- Should I be using Kriging results at all?

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.

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 CD containing all relevant teaching materials.

Each delegate will receive a copy
Of the practical Geostatistics 2000 text book and CD containing (Digital version of text book and PG 2000 software, data sets and tutorials)

Course Format

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Who Should Attend

But not limited to:

- Mining Geologists (Exploration, Production, Resource)
- Mining Engineers
- Mine Surveyors
- Geologist
- Geologist(Trainee)
- Mineral Resource Managers
- MRM Practitioners
- Sampling Personnel
- Sampling Supervisors/Managers
- biologists
- Metallurgist(Trainee)
- Mineral Resource Managers
- Resource Analysts
- Mine Managers
- Mine Supervisors
- Geophysicists
- Geochemist
- Geometallurgist
- statisticians

All delegates will receive 5 CPD credits
Certificates will also indicate your CPD
Credits and serve towards your professional advancement

Just a few companies to mention that have attended our past mining Workshops

Anglo American Platinum Mine., Worley Parsons, Cronimet Chrome Mining, Evander Gold Mine, Maptek, Northam Booyseendal Mine, Sabodala Gold Operations SA, Lonmin, Glencore, African Mining & Trust, African Rainbow Minerals Limited, Coal of Africa, Sasol Services, SRK Consulting Pty Ltd, United Manganese of Kalahari, Bafokeng Rasimone Platinum Mine, Discovery Metals Limited, Keaton Mining, Leeuw Mining & Exploration (Pty) Ltd, Metsana Group, Stefanutti Stocks Mining Services, Black Mountain Mining (Pty) Ltd, Exxaro Annot Coal, Samancor Chrome Limited, Intertek Genalysis SA (Pty) Ltd, Mitra SK South Africa, Siza Coal Services CC, Assmang Chrome, Nkomati Mine, TRP, South Deep Gold Mine, Sibanye Gold, Anglo Gold Ashanti, Botswana Ash (Pty) Ltd, Idwala, Sasol, UNIVEN, AMIS...

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Practical Geostatistics & Mineral Resource Estimation

12th – 16th November 2018 – Oaklands Inn & Conference Centre

Course Content

Part 1 (12th – 14th November 2018) **Practical Geostatistics**

Session 1

- The basic assumptions of spatial estimation methods
- Inverse Distance interpolation methods
- Classical statistics: the Normal distribution

Session 2

Statistical Methods

- The lognormal distribution
- Confidence levels
- Standard errors
- Grade/tonnage curves

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

- Variations on kriging
- Lognormal methods
- Indicator methods
- Non-linear geostatistics
- Regression problems (conditional bias)
- Simulation

Session 6

Case Studies and discussions on your own data (BYO)

Part 2 (15th -16th November 2018) **Mineral Resource Estimation**

In Part 2 of this course YOU will be bringing YOUR own data. This will be a BYO session preliminary study of real data sets and open discussion guided by participants' interests and previous Q&A sessions.

on participants' interests we can go in depth to the following topics:

1. Basic assumptions and requirements for mineral resource estimation
2. Data validation, top-cuts and capping
3. Construction, interpretation and modelling of semi-variograms
4. Model validation and reconciliation with geological knowledge
5. Geostatistical resource estimation, 3D and block modelling and Kriging
6. Other Kriging techniques, such as MIK and Lognormal Kriging
7. Discussion covering the advantages/limitations of different estimation methods
8. Reserve estimation and possible classification definitions
9. Geostatistical Simulations and Risk Assessment
10. Grade control
11. Drill hole spacing analysis
12. Dynamic Anisotropy estimation

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

Session 10

Case Studies and BYO

- general discussion of case studies
- simulation techniques

**In House Training Packages Tailor Made to suit your organisations needs.
Contact Hamesh Ramparsad on 074 869 5047 or email hamesh@spectaculartc.co.za**

Facilitator Profile and Partial list of Consultancies and Projects in Africa

- Ad hoc advice on mineral sands applications, for Shell Minerals, South Africa
- Advice on sampling at Richards Bay Minerals, South Africa
- American Mineral Fields Int. Ltd., supervision of feasibility study --- valuation and geology
- Assessment of Alexander Bay Diamond Mine, South Africa
- Audit of resources, tantalite deposit, Mozambique
- Evaluation of mining resources, Hartebeestfontein Mine, South Africa
- Fergusson Stewart, Johannesburg, evaluation of Joel Mine.
- Freda-Rebecca Mine, Zimbabwe
- General Mining Union Corporation, Johannesburg
- Ghanaian Australian Goldfields, geostatistical modelling and advice on valuation
- Hartley Platinum, BHP Zimbabwe, peer review.
- Investigation of problems with Mine Call Factor for Libanon Mine, South Africa
- ISCOR Mining, audit of valuation for deposit in Zaire
- Johannesburg Consolidated Investment Limited, Johannesburg
- Lonrho Zimbabwe, advice on evaluation of small gold deposits
- Lumwana Copper Mine, Zambia for Barrick Corporation
- MIMCO, South Africa, evaluation of gold mine.
- MineNet South Africa, evaluation of resources and reserves at Skorpion project, Namibia
- Mineral resource and reserve valuation for Skorpion Zinc project in Namibia
- Palabora Mine, underground development, RTZ Management Services, Johannesburg.
- Potgietersrus Platinum, JCI, benchmark evaluation.
- Public statement of remaining reserves at the Droogebult Mine, South Africa
- Resource evaluation studies for Lonrho Platinum, South Africa.
- Short training for Nigerian Geological survey
- Small scale consultation, AngloGold Ashanti Goldfields
- Study of sampling methods and calibrations for Namco Diamond Mining, Cape Town
- Tenke Fungurume project, Congo audit of computerized database
- Vaal Reefs Exploration & Mining Co. Ltd., audit of annual reserve statement
- Valuation advice for the Ayanfuri Project, Ghana for Cluff Minerals

Your World Class Expert Course Presenter: Dr Isobel Clark



Dr Isobel Clark is a professional Mining Engineer who specializes in the technical evaluation of mineral resources and reserves at all stages in the life of a mine. She has taught, researched and consulted in the field of geostatistics for over 45 years and has wealthy experience in practical application of computer-based design and evaluation methods. Possibly best known as the author of the introductory text "Practical Geostatistics" (1979), she is also co-author of a more complete textbook "Practical Geostatistic" (2000). With proven communication skills honed by training non-specialists, she has conducted numerous short courses on a regular basis to companies and educational institutions in four continents. Dr Clark lectured for 11 years at the Royal School of Mines, Imperial College, London, at the University of Witwatersrand in Johannesburg for 9 years and was visiting professor at Camborne School of Mines for 2 years. Isobel acts as a Director of Geostokos Limited and also maintains her position as associated educator at Geostokos (Ecosse) Limited, two international consultancy companies based in Central Scotland. Her recent consultancy assignments range from the evaluation of diatomite deposits in the USA to the study of protected sea-birds in the UK. Dr Isobel received her Ph.D. in Mining Engineering from the University of London, specialising in the reconciliation of grade control data with actual production. In addition to formal qualifications, she regularly attends relevant conferences to learn new methods, theory and applications. She also attends seminars and meetings of the various professional societies of which she has memberships



Practical Geostatistics & Mineral Resource Estimation

12th, 13th, 14th, 15th & 16th November 2018

Oaklands Inn & Conference Centre

Fax Completed Registration Form To: +27 11 326 1980/ 086 689 1507

or email: marketing@spectaculartc.co.za

Please choose your option

R24990

Per delegate excl vat
Includes 5nights
accommodation (B&B)

R19990

Per delegate excl vat
excludes accommodation (B&B)

Company Name: _____

Type of Business: _____

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Tel: _____

VAT Number: _____

Delegate 1:	
Position:	Email:
Delegate 2:	
Position:	
Delegate 3:	
Position:	
Delegate 4:	
Position:	
Delegate 5:	
Position:	
Delegate 6:	
Position:	

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Authorization: Signatory must be authorized to Sign on behalf of Company (This is a legally binding document)

Name: _____ Position: _____

Signature: _____ Date: _____ WEB

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1. Cheques: Payable to Spectacular Training and Conferences

2. Bank Transfer: Spectacular Training and Conferences

Bank: FNB Account No: 62227137503 Branch Code: 221325

NB: SPECTACULAR TRAINING & CONFERENCES ARE NOT LINKED TO ANY OTHER BANK

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- All payments to be made directly to Spectacular Training and Conferences, payment is required in full 5 days from date of invoice.
- No seats will be reserved, unless other wise stated by Spectacular Training and Conferences.
- Spectacular Training and Conferences reserves the right to change speakers, program content date and venue, due to unforeseen circumstances.
- The signed registration form is a legally binding document.
- The conference / workshop fee includes conference / workshop material, Lunches and refreshments.
- Spectacular Training and Conferences will not be held liable for travel and accommodation.

Cancellations

All cancellations must notify Spectacular Training and Conferences in writing and all cancellations will be subject to approval by Spectacular Training and Conferences management.

All cancellations made 60 days **which excludes weekends, holidays and public holidays** prior to date of the above mentioned event will be subject to a 50% cancellation fee.

Cancellations made within 30 days **which excludes weekends, holidays and public holidays** of date of the above mentioned event will be subject to a 100% cancellation fee.

There will be no refunds or credit vouchers.

Substitutions

Delegates of any substitutions must notify Spectacular Training and Conferences in writing.

There is no charge for substitutions. Spectacular Training and Conferences will not be held liable for incorrect delegate details on certificates, etc. in the event of substitutions been made on the day of the conference/ workshop.

Delegates will be issued with a credit voucher, which may be used at another of our events **should** Spectacular Training and Conferences cancel or postpone an event due to the state of affairs beyond our control.

Views expressed by speakers and facilitators are not necessarily those of Spectacular Training & Conferences