

Structural geology, regional geophysics and portable instruments for field mapping Agate/WAXI Training



3rd - 8th April 2023
Abidjan, Côte d'Ivoire

This course is aimed at geologists wishing to refresh their knowledge based on structural geology and field mapping techniques including the use of portable techniques. It introduces the basic principles of structural geology and tectonics with

a focus on mineralisation. The objectives of this course are to cover the description and analysis of geological structures in the Earth's crust and provide insights through the fundamental principles of mapping. The course emphasis on classic structural elements such as faults and shear zones, folds, tectonic styles and the geophysical expression providing tools and techniques critical for both field mapping and geophysical expression of common structures.

The training also includes advanced topics such as interpretation of geophysical data, digital measurement, and acquisition of measurements using portable equipment (Spectroradiometer, portable XRF, magnetic susceptibilitymeter) as well as the visualisation and analysis of structural data.

This six-days-long course will provide hands-on-training through a combination of two days of theoretical classes and three days of field work in the Toumodi-Yamoussoukro-Yaoure region designed to:

- Reinforce basic structural understanding of structural geology as well as field mapping techniques;
- Use of portable equipment (Spectroradiometer, portable XRF, magnetic susceptibilitymeter) for field mapping (lithological mapping)
- Show how to integrate field structural observations with regional geological and geophysical datasets;
- Demonstrate how to integrate field structural and geophysical/geochemical (portable equipment) observations with an understanding of mineral systems for regional scale exploration;

Important note: The course is NOT aimed at detailed characteristics and cartography of alteration zones but is aimed on a use of portable instruments for mapping of rock and regolith in the field.

Programme

Day	Date	Course Element
Day 1	Monday (AM)	Welcome Lecture 1: Introduction to the West African Geology Lecture 2: Geology of Cote d'Ivoire Lecture 3: Geological mapping, tools and methods
	Monday (PM)	Lecture 4: Basics of geophysics (radiometrics, gravimetry, magnetics, resistivity)
Day 2	Tuesday (AM)	Lecture 6: Geophysical data interpretation and use for mapping Lecture 7: Practical exercise
	Tuesday (PM)	Lecture 8: Portable instruments: tools for mapping Lecture 9: Practical exercise
Day 3	Wednesday (AM)	Lecture 10: Structural mapping, tools and techniques Lecture 11: Practical exercise
	Wednesday (PM)	Lecture 12: Use of phones and tablets for geological mapping Travel to Yamoussoukro
Day 4	Thursday (all day)	Field mapping: mafic and felsic intrusive and volcanic rocks of the Fetekro-Toumodi belt, PI measurements and geophysical data interpretation and use for mapping Faults and folds field analysis, Vein analysis
Day 5	Friday (AM)	Visit of the Yaoure mine site, study of drill core
	Friday (PM)	Field mapping: Fault and vein analysis
Day 6	Saturday (all day)	Field mapping: mafic and felsic intrusive and volcanic rocks of the Fetekro-Toumodi belt, PI measurements and geophysical data interpretation and use for mapping

Background

Applied structural geology is vastly under-utilized in the mining and mineral exploration industry. This situation stems from the following factors:

- A lack of understanding that structural geology inputs add value to mining operations and exploration programs. This is a matter of understanding ore systems, to which structural geology can add value.
- A lack of knowledge of structural principles. Most graduate geologists have training in geochemistry and petrology and applications, but are commonly weak in field mapping and structural geology. This issue is a matter of training.
- A lack of confidence. Many geologists lack confidence in applying structural geology principles to solve practical problems. This point can be addressed through training and with an emphasis on "boots-on-the-ground" and "eyes-on-the-rock". Many industry geologists have the required skills, but too often receive little encouragement or mentoring in applying them.

Information

- A lack of time. Proper application of structural geology techniques requires time that is difficult to find, given the production pressures of a mining operation and the performance pressures of an exploration program. In industry, one is constantly pressured to optimize time, and structural mapping is perceived to be of secondary importance.

The use of portable field instruments such as spectroradiometer, portable XRF and magnetic susceptibilitymeter combined with the interpretation of airborne radiometric and magnetic geophysical data for geological mapping of mineral deposits is also under-utilized. The potential of these datasets is not fully exploited because the geologists who are doing field work lack the training in the interpretation of geophysical data and the geophysicists do not fully use the field (in particular the structural) datasets.

The aim of this course is to address the problems above, by providing the tools and confidence required to apply structural geology, lithology mapping and field measurements of rock petrophysics and geochemistry with portable instruments. Throughout the course, students will be encouraged to stretch interpretations based on the integration of all available information, including geophysical data, structural and geochemical field observations, using portable tools, in order to derive implications for regional structure and exploration implications.

Course Leaders:

This course is organised by Lenka Baratoux (IRD), David Baratoux (IRD), Alain Koumelan, Loukou Nicolas Kouame and Augustin Yao Koffi from the University Felix Houphouet Boigny in Abidjan, who collectively have extensive experience in structural geology, use of portable instruments (XRF, Radiometry, magnetic susceptibilitymeter), interpretation of various sets of geophysical data (radiometrics, magnetics, gravimetry, resistivity) and its application for the study of mineral deposits across scale ranging from deposit through to regional scale.



Lenka Baratoux



David Baratoux



Augustin Koffi



Nicolas Kouame



Alain Koualéman

Registration Fees

For the full 6 days of training, including training materials.

WAXI Sponsors US\$2,300 per attendee

Non-WAXI sponsors AU\$2,500 per attendee

Language

This course will be run in French, however please contact us if you would like to have it run again in English

Registration

Register and pay online on the Agate website, or using the form on the next pagepage

Certificate of Attendance

Upon completion, participants will receive a certificate of attendance



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**Either complete this form or register online:
<https://agate-project.org/training-courses/short-courses/>**

Company

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Attendee's Name 3.....

Attendee's Name 4.....

Total Registration Fees

US\$2,300 per person for WAXI sponsors &
US\$2,500 for non-WAXI sponsors

Email: Corinne.Debat@agate-project.org

On confirmation of your places, we will ask you to transfer the registration fee to a bank account to be announced.