DATAMINE

geovariances

TRAINING CATALOG

2026

Subsurface // Oil & Gas

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About Geovariances

Who We Are

Geovariances is a globally renowned provider of premium geostatistics solutions, offering advanced software, expert consulting, and industry-leading training. Founded in 1986 as a spin-off of the Centre for Geostatistics at the Paris School of Mines, we have been at the forefront of geostatistical innovation for four decades.

Our commitment to scientific rigor and technical excellence is reflected in our long-standing exclusive partnership with the Centre for Geostatistics. We empower mining companies to improve production performance and make informed, data-driven decisions by integrating geostatistics into their operations. Our solutions help businesses evaluate alternative scenarios, better understand geological complexities, and reduce operational risks.

At Geovariances, we recognize the challenges mining professionals face in achieving operational efficiency while managing uncertainty. That's why our team of dedicated experts collaborates closely with clients to tailor geostatistical approaches to their specific needs, delivering reliable, actionable insights that optimize their decision-making processes.

Our Global Offering

ISATIS.NEO – THE POWER OF GEOSTATISTICS AT YOUR FINGERTIPS

Isatis.neo is Geovariances' flagship geostatistical software, trusted by leading industry players for its analytical strength, usability, and transparency. Equipped with a user-friendly interface, intuitive workflows, and robust algorithms, Isatis.neo delivers deep insight into mineral resource projects while ensuring full auditability and reproducibility of results.

As the most comprehensive geostatistics desktop solution on the market, Isatis.neo supports a wide range of estimation and simulation methods. It enables users to meet the highest technical standards in resource evaluation and project risk analysis.

TRAINING, CONSULTING & MENTORING SERVICES

Geovariances offers a broad portfolio of training courses in applied geostatistics, delivered by seasoned specialists with deep domain expertise. Whether you are new to geostatistics or seeking to enhance your knowledge in advanced modeling techniques, our training programs are designed to build both theoretical understanding and practical competence.

In addition, we provide customized consulting and mentoring services, supporting clients in areas such as:

Subsurface engineering:

– Developing ground models (geology, geotechnical parameters) and characterizing variability.
– Assessing geotechnical risks and delivering multiple risk scenarios.
– Modeling aquifer geometry.
– Optimizing measurement and monitoring networks.

Oil reservoir characterization:

– Applying seismic filtering, cube merging, and time-to-depth conversion.
– Modeling lithofacies, geological structures, petrophysical and geomechanical parameters.
– Analyzing geobody connectivity.
– Identifying spill points and delineating potential reservoir traps.
– Generating scenarios of recoverable oil resources and gross rock volumes.

Our services are available onsite, online, or at Geovariances' offices worldwide, ensuring flexible access to world-class expertise.

Learn more at: Geovariances Technical Resources.

Meet the Team

DISCOVER OUR EXPERTS

At Geovariances, our strength lies in the expertise of our people. Our team is composed of highly qualified professionals with a proven track record of delivering outstanding results across various industries, including mining, subsurface geoscience, oil & gas, environment, and geotechnics.

Pedram Masoudi, Ph.D. – Senior Consultant in Geostatistics

Pedram is a specialist in geostatistics and a lead trainer for Isatis.neo. He applies geostatistics to mineral resource estimation and classification in accordance with international standards such as JORC, as well as to geological and domain modeling. His additional strengths include Python programming and machine learning, with broader experience in geotechnical site characterization, petroleum exploration, and contaminated soil studies.

Roberto Rolo, Ph.D. – Data Science and Resource Expert

Roberto is a Mining Engineer from UFOP with a master's and Ph.D. in geostatistics from UFRGS. His expertise includes implicit geological modeling, ore grade estimation, and the design of simulation workflows that comply with international mineral reporting codes. He is also highly skilled in Python and machine learning applications in the geosciences.

Travel Policy

To ensure the health and safety of our employees during travel, Geovariances adheres to the following guidelines:

Air Travel:

Preference to regular passenger aircraft for travel, and if charter planes are necessary, they must meet a minimum standard of twin-turbo engine with at least two crew members. We reserve the right to refuse travel on planes that do not meet this standard, and any resulting delays will be charged to the customer. We will travel in business class or its equivalent for international flights over six (6) hours.

Ground Transportation:

Rental vehicles must be full-size sedans equipped with ABS brakes and a minimum of four airbags. If the vehicles provided do not meet this standard, Geovariances reserves the right to upgrade them, with associated costs to be borne by the client.

Driving Limits:

Daily driving time is limited to a maximum of 10 hours. Any additional costs incurred to comply with this limit will be charged to the contracting party.

Helicopter Travel:

Helicopter transportation will be evaluated on a case-by-case basis, considering safety and operational requirements.

Geostatistics for Subsurface Characterization

Data Analysis, Mapping, and Subsurface Property Modeling with Geostatistics

Harness geostatistical methods for insightful data analysis, accurate surface mapping, robust subsurface property modeling, and effective uncertainty quantification.

OBJECTIVES

This course aims to equip you with essential skills to **analyze your data in depth** using advanced geostatistical tools, **deliver reliable, detailed maps** by integrating different types of information, and **accurately quantify the uncertainties** associated with your models. You will also learn the **fundamental assumptions of key geostatistical methods**, enabling you to select the approach best suited to your data and operational goals.

COURSE CONTENT

DAY 1: ANALYZING DATA AND THEIR VARIABILITY IN SPACE AND MAPPING

Introduction to geostatistics:

- **Understanding the role of geostatistics** compared to deterministic spatial interpolation methods and identify scenarios where it offers real added value.
- **Reviewing common deterministic interpolation methods** (nearest neighbor, moving average, inverse distance, etc.) and highlighting their strengths and limitations.

Exploratory data analysis (EDA) and validation:

- **Using statistical tools** to analyze, control quality and detect outliers: mean, variance, histograms, correlation coefficients, linear regression, etc.
- **Visualizing data in 2D and 3D** to better understand their distribution and spatial structure.

Spatial variability assessment:

- **Calculating, interpreting, and modeling** the experimental variog spatial structures present in the data.

DURATION

14 hours / 2 days

LEVEL

Fundamentals

TYPE

Theory and practice

MODE

Online or in-person course

Open or in-company sessions

PRICE

Open session (online): EUR 1 100 / person

In-company: On demand

– **Presentation of key theoretical variogram models** and learning how to adjust them to the data.

Interpolation by kriging:

– **Fundamental principles and properties of kriging**, including its characteristic effects, such as smoothing.
– **Optimizing the kriging neighborhood**: single or sliding neighborhood, search size, number of samples, etc.
– **Analyzing kriging weights** based on interpolation parameters (position, neighborhood, nugget effect, etc.).

DAY 2: REFINING THE MAPS

Cross-validation:

– **Implementing cross-validation** to assess variogram models and confirm the accuracy of interpolation results.

The different variants of kriging:

– **Discovering and applying different types of kriging**, such as simple, ordinary, and measurement error kriging, to identify the most appropriate method for your data.

Multivariate geostatistics:

– **Analyzing correlations between variables**, whether quantitative or semi-quantitative (such as remote sensing, DTM, land use, physico-chemical models, pollutants, etc.), using scatter plots and correlation coefficients.
– **Examining spatial relationships between variables** with cross-variograms.
– **Incorporating secondary variables** into interpolation through cokriging and collocated cokriging: principles, applications, and benefits over traditional kriging.

Non-stationary geostatistics:

– **Considering spatial trends and drifts** using methods tailored for non-stationary conditions.

Simulations and risk analysis:

– **Introduction to geostatistical simulation methods** for quantifying uncertainties and analyzing risks, illustrated with practical examples.

Practical exercises:

– **Exercises applied to real-life cases** to reinforce theoretical knowledge and enhance practical skills that can be used immediately.

OUTLINES

- **Balanced learning approach**: The course combines theory with practical applications, ensuring concepts are understood and applied effectively.
- **Hands-on software training**: Engage in computer-based exercises using Isatis.neo software, reinforcing learning through real-world data scenarios.
- **Personalized feedback**: Receive individualized guidance and feedback from experienced trainers during online sessions to support your learning journey.
- **Comprehensive resources**: Access detailed course materials, including documentation, journal files, and datasets, to reinforce learning and facilitate application post-training. You will also receive a temporary Isatis.neo license.

WHO SHOULD ATTEND

This course is ideal for professionals working with spatial data across various fields, including:

- Geoscientists and reservoir engineers involved in geomodeling and reservoir characterization and looking for a practical, synthetic, and pragmatic introduction to geostatistical methods for reservoir characterization.
- Environmental consultants and engineers aiming to enhance data analysis and mapping capabilities.
- Academics and researchers.
- Agricultural engineers, air quality specialists, climatologists, epidemiologists, foresters, geotechnical engineers, soil scientists, and others interested in spatial data analysis.

PREREQUISITES

No prior knowledge of geostatistics is required; however, a basic understanding of elementary statistics is recommended to facilitate comprehension of course material.

Geological Modeling by Geostatistics

Learn to build realistic and uncertainty-aware models using advanced geostatistics and enhance your geological understanding.

OBJECTIVES

- Unlock the skills to build **reliable, realistic, data-driven geological models** that capture uncertainty, boosting the credibility of your subsurface interpretations and empowering you to make smarter, more confident decisions.
- Get hands-on with powerful geostatistical methods, like Indicator Kriging and simulations (SIS, TGS, PGS), and apply them using Isatis.neo's intuitive tools, including implicit modeling and the Unfolding feature for tackling complex stratigraphy with confidence.

COURSE CONTENT

Foundations & Indicator Kriging

- Discover indicator kriging, how it works, and when to use it.
- Learn how to apply it in practice in Isatis.neo to build geological models and define domains.

Conditional Simulations

- Learn about the main facies simulation methods: sequential indicator simulation (SIS), truncated Gaussian simulation (TGS) and multi-Gaussian simulation (PGS).
- Understand their principles, key steps and differences.
- Implement them in Isatis.neo using the dedicated options.

Implicit Modeling

- Explore how to use potential fields to model stratigraphic units or intrusive bodies automatically.
- Create consistent and continuous surfaces from geological data.

Unfolding

— Transform complex geometry into a flattened space, where continuity is easier to model.

DURATION

21 hours / 3 days

LEVEL

Advanced

TYPE

Theory and practice

MODE

Online or in-person course

Open or in-company sessions

PRICE

Open session (online): EUR 1 650 / person

In-company: On demand

OUTLINES

- **Balanced learning approach**: The course combines theory with practical applications, ensuring concepts are understood and applied effectively.
- **Hands-on software training**: Engage in computer-based exercises using Isatis.neo software, reinforcing learning through real-world data scenarios.
- **Personalized feedback**: Receive individualized guidance and feedback from experienced trainers during online sessions to support your learning journey.
- **Comprehensive resources**: Access detailed course materials, including documentation, journal files, and datasets, to reinforce learning and facilitate application post-training. You will also receive a temporary Isatis.neo license.

WHO SHOULD ATTEND

The course is intended for any geoscience professional wishing to develop their skills in geological and facies modeling.

PREREQUISITES

This course covers advanced geostatistical concepts. It is therefore recommended that participants have a solid foundation in variography, kriging, and simulation.

Multiple-Point Statistics Simulations with Isatis.neo – MPS

Go beyond variograms. Learn to simulate complex geology and subsurface properties with cutting-edge MPS tools.

OBJECTIVES

This course introduces you to Multiple-Point Statistics (MPS), a powerful simulation technique for **modeling complex spatial variability using training images**. Developed in collaboration with the University of Neuchâtel, the course combines **theoretical foundations with hands-on practice using Isatis.neo and its integrated DeeSse engine**. You'll learn to select suitable training images, prepare your data, and generate realistic subsurface models, whether **categorical or continuous**. Ideal for applications in mining, hydrogeology, remote sensing, and reservoir modeling, MPS equips you to assess uncertainty and model features driven by geological morphology, such as channelized permeability or ore grades in vein deposits.

COURSE CONTENT

Theory:

- **Introduction to the MPS approach** to understand its principles, advantages, and the situations in which it offers real added value.
- **Discovering tools for managing non-stationarity**—rotation, scaling, proportions, and trends—to adapt the method to various geological contexts.
- **Optimizing neighborhood parameters** with a clear explanation of their role and practical advice for improving simulation quality.
- **MPS simulation of continuous** variables to learn how to model properties that vary gradually in space.
- **Multivariate MPS simulation**, demonstrating how to integrate several correlated variables into a single, consistent model.
- **Multi-resolution MPS simulation**, to learn how to combine information to represent geological structures better.

DURATION

14 hours / 4 half days

LEVEL

Intermediate

TYPE

Theory and practice

MODE

Online or in-person course

Open or in-company sessions

PRICE

Open session (online):

EUR 1 100 / person

In-company: On demand

– **Use of MPS to fill gaps**, showing how to exploit partial and indirect information to complete areas without data.

Practice in Isatis.neo:

– **Discovering the method through a simple, historical case** study to understand the basic principles step by step.

– **Exploring different geometric patterns** to observe how MPS reproduces various structures and to understand their behavior better.

– **Simulating the depth of a geological horizon** to apply the method to a continuous variable.

– **Scaling a soil property (permeability) in a multivariate context** to learn how to integrate and harmonize several variables within the same model.

– **Simulating a fracture network at different resolutions**, demonstrating the ability of MPS to capture variability at multiple scales.

– **Modeling sedimentary deposits in the Roussillon plain (France**), providing a realistic example that links theory to a concrete geological case.

– **Filling in data gaps using geophysical information** to understand how to leverage complementary sources and improve models.

OUTLINES

– **Balanced learning approach**: The course combines theory with practical applications, ensuring concepts are understood and applied effectively.

– **Hands-on software training**: Engage in computer-based exercises using Isatis.neo software, reinforcing learning through real-world data scenarios.

– **Personalized feedback**: Receive individualized guidance and feedback from experienced trainers during online sessions to support your learning journey.

– **Comprehensive resources**: Access detailed course materials, including documentation, journal files, and datasets, to reinforce learning and facilitate application post-training. You will also receive a temporary Isatis.neo license.

WHO SHOULD ATTEND

This course is tailored for professionals and researchers involved in spatial modeling who want to enhance their ability to simulate complex geological structures and facies distributions using Multiple-Point Statistics (MPS). Ideal participants include:

– **Geologists & geomodelers**

Working in mining, oil & gas, or hydrogeology, those who need to model intricate geological patterns – such as channels, fractures, or stratigraphy, that are difficult to capture with traditional variogram-based approaches.

– **Reservoir engineers**

Focused on building realistic facies or property models that improve reservoir characterization and flow simulations.

– **Environmental & hydrogeological scientists**

Needing to simulate spatial heterogeneities in aquifer systems with geological realism.

– **Geostatisticians and data scientists**

Looking to deepen their expertise in MPS and apply advanced simulation techniques using training images and high-resolution geological analogs.

– **Consultants and technical advisors**

Supporting clients with subsurface modeling projects who want to stay at the forefront of geostatistical innovation.

– **Researchers and academics**

Engaged in spatial data analysis, stochastic simulation, or geoscientific modeling who want to explore MPS in practical workflows.

PREREQUISITES

None.

Having a theoretical understanding of geostatistical methods is beneficial.

Machine Learning Applied to Geosciences

Gain insight into Machine Learning concepts and practices for the mining industry. Apply them to domain modeling.

OBJECTIVES

In this hands-on course, you'll unlock the power of machine learning to elevate geoscientific workflows. You'll learn how to define geological domains, apply classification and regression algorithms, and seamlessly integrate Python's scikit-learn with Isatis.neo. Through a balanced mix of theory and practical exercises, you'll build routines that enhance ground characterization.

COURSE CONTENT

- **Module I**: **General aspects of Machine Learning and introduction to Python.**
- **Module II**: **Unsupervised learning**

  Data transformations, clustering techniques: theory and practice, cluster quality evaluation.
- **Module III**: **Supervised learning**

  Predictive models: theory and practice, model validation, hyperparameter tuning, model application.

OUTLINES

- **Balanced learning approach**: The course combines theory with practical applications, ensuring concepts are understood and applied effectively.
- **Hands-on software training**: Engage in computer-based exercises using Isatis.neo software, reinforcing learning through real-world data scenarios.
- **Personalized feedback**: Receive individualized guidance and feedback from experienced trainers during online sessions to support your learning journey.
- **Comprehensive resources**: Access detailed course m documentation, journal files, and datasets, to reinforce lear application post-training. You will also receive a temporary Isatis.n

DURATION

21 hours / 3 days

*** The course can be reduced to two days by removing Module II or Module III from the program.***

LEVEL

Intermediate

TYPE

Theory and practice

MODE

Online or in-person course

Open or in-company sessions

PRICE

Open session (online): EUR 1 650 / person

In-company: On demand

WHO SHOULD ATTEND

This course targets professionals seeking theoretical and practical knowledge of Machine Learning and its applications in geosciences.

PREREQUISITES

Basic knowledge of statistics, algebra, and geostatistics is recommended. Familiarity with Python is optional.

Petroleum Geostatistics

Seismic Data Filtering and Depth Conversion with Geostatistics

Learn to use geostatistics effectively for accurate time-to-depth conversion and thorough uncertainty analysis of reservoir volumes.

OBJECTIVES

- Understand and implement geostatistics to build robust reservoir structural models.
- Improve seismic data quality with geostatistical filtering.
- Make the best use of all available data to achieve robust time-to-depth conversion.
- Perform quantified uncertainty analysis on traps and reservoir volumes.

COURSE CONTENT

SESSION 1: QC AND FILTERING

Quality control of seismic data

- Identify possible data outliers, anisotropies, trends, etc.

Understanding and filtering of several artifacts (noise, footprints, acquisition artifacts)

- Quantification of the spatial variability: variogram calculation, interpretation, and modeling.
- Seismic filtering by kriging (2D/3D): principles and properties.

SESSION 2: TIME-TO-DEPTH CONVERSION

Multivariate geostatistics for time-to-depth conversion

- Integration of seismic data or velocity model parameters and wells information in the interpolation. Analysis of the correlations between variables. Multivariate variogram. Co-kriging.
- Multi-layer approach and Bayesian techniques to reduce the uncer

SESSION 3: UNCERTAINTY ANALYSIS

Uncertainty quantification

- Introduction to the conditional simulations for uncertainty quantific

DURATION

14 hours / 2 days

LEVEL

Advanced

TYPE

Theory and practice

MODE

Online or in-person course

Open or in-company sessions

PRICE

Open session (online): EUR 1 100 / person

In-company: On demand

– Difference between kriging and conditional simulations.

Trap analysis and volumetrics

– Probability maps.

– Risk analysis.

How to find the best model

– Introduction to Geostatistical Inversion.

SESSION 4: EXERCISES WITH ISATIS.NEO AND CONVERSIONS & UNCERTAINTIES WORKFLOW.

OUTLINES

– **Balanced learning approach**: The course combines theory with practical applications, ensuring concepts are understood and applied effectively.

– **Hands-on software training**: Engage in computer-based exercises using Isatis.neo software, reinforcing learning through real-world data scenarios.

– **Personalized feedback**: Receive individualized guidance and feedback from experienced trainers during online sessions to support your learning journey.

– **Comprehensive resources**: Access detailed course materials, including documentation, journal files, and datasets, to reinforce learning and facilitate application post-training. You will also receive a temporary Isatis.neo license.

WHO SHOULD ATTEND

This course targets geophysicists involved in data interpretation and mapping of surfaces that limit the reservoirs.

PREREQUISITES

Since the course covers advanced geostatistical concepts, it is strongly advised that attendees have a solid understanding of variography and kriging.

The course *Data Analysis, Mapping, and Subsurface Property Modeling with Geostatistics* covers the fundamental concepts of geostatistics for Oil & Gas and provides an ideal foundation for this course.

Advanced Geostatistics for Reservoir Characterization

Learn the latest techniques in reservoir characterization and property and facies modeling through stochastic simulations.

OBJECTIVES

- Generate robust 3D reservoir static models using standard and advanced geostatistical simulation techniques. Discuss their pros and cons.
- Improve model quality by integrating various data sources in the interpolation process and filtering seismic data.
- Perform facies modeling with a focus on the analysis of proportion curves and the role of the stratigraphic reference surface.
- Learn simulation techniques to populate the model with petrophysical properties constrained by the facies distribution.

COURSE CONTENT

DAY 1: HORIZON MAPPING AND GEOPHYSICAL RESERVOIR CHARACTERIZATION

- Overview of the standard geomodeling workflow
- Data integration techniques (kriging in the multivariate case, kriging with external drift and kriging with Bayesian drift, kriging with uncertain data) with application examples in Time-to-Depth conversion and regional integration of seismic data
- Introduction to geostatistical filtering of seismic data with factorial kriging
- Application of geostatistical simulations for assessing uncertainty on maps

DAY 2: POPULATING A GEOLOGICAL MODEL WITH FACIES

- Facies definition from logs with a geostatistical clustering technique
- Presentation of facies distribution modeling concepts

DURATION

21 hours / 3 days

LEVEL

Intermediate

TYPE

Theory and practice

MODE

Online or in-person course

Open or in-company sessions

PRICE

Open session (online): EUR 1 650 / person

In-company: On demand

– Common simulation algorithms for categorical variables (facies)
– Indicator simulations (**SIS**)
– Truncated Gaussian (**TGS**) and Plurigaussian (**PGS**) simulations
– Boolean simulations (**object-based**)
– Multiple-Point Statistics (**MPS**)
– Process-based approaches (**Flumy**)
– Accounting for structural constraints in facies modeling

DAY 3: POPULATING A GEOLOGICAL MODEL WITH PROPERTIES – CONNECTIVITY INTEGRATION

– Advanced analysis of petrophysical properties in facies
– Common simulation algorithms for petrophysical properties
– Volumetrics and quantification of the associated uncertainty
– Accounting for dynamic data (honouring connectivity information).

OUTLINES

– Introduction to the different concepts through **a step-by-step workflow** analysis and description.
– **Balanced learning approach**: The course combines theory with practical applications, ensuring concepts are understood and applied effectively.
– **Hands-on software training**: Engage in computer-based exercises using Isatis.neo software, reinforcing learning through real-world data scenarios.
– **Personalized feedback**: Receive individualized guidance and feedback from experienced trainers during online sessions to support your learning journey.
– **Comprehensive resources**: Access detailed course materials, including documentation, journal files, and datasets, to reinforce learning and facilitate application post-training. You will also receive a temporary Isatis.neo license.

WHO SHOULD ATTEND

This course targets professionals, geologists, geophysicists, and reservoir engineers involved in reservoir characterization.

PREREQUISITES

Since this course explores advanced geostatistical concepts, it is strongly recommended that attendees possess a solid understanding of variography and kriging. The course titled *Data Analysis, Mapping, and Subsurface Property Modeling with Geostatistics* covers the fundamental principles of geostatistics specific to the Oil & Gas industry and serves as an ideal foundation for this advanced course.

An Overview of Geostatistics for the Oil & Gas Industry

Discover the role of geostatistics in reservoir characterization: a one-day awareness seminar designed to broaden your perspective.

OBJECTIVES

This course provides a quick, practical overview of how geostatistics - using techniques like variogram analysis, kriging, simulation, and uncertainty quantification- can enhance seismic interpretation, facies modeling, property estimation, and risk assessment. Perfect for managers and decision-makers, this session combines theory with real-world applications and requires no prior geostatistical experience.

COURSE CONTENT

Introduction: Geostatistics concepts and tools and their applications (30')

Core concepts and applications of geostatistics in the E&P field, laying the foundation: experimental variogram and variogram fitting, kriging and its variants, and simulations.

Geostatistics for: data analysis, control, and enhancement; mapping; geological modeling; and quantifying uncertainty.

Application 1: Data analysis, control, and enhancement (30')

Statistical data quality checks, outlier detection, identification of spatial behavior and hidden correlations, characterization of geological properties, data transformation using Gaussian anamorphosis.

Application 2: Seismic data filtering (45')

Geostatistical characterization of noise and acquisition artifacts, techniques for filtering seismic amplitude/velocity data, considering global vs. local strategies and 4D contexts.

Application 3: Time-to-depth conversion (40')

DURATION

7 hours / 1 day

LEVEL

Awareness

TYPE

Theory and practice

MODE

Online or in-person course

Open or in-company sessions

PRICE

Open session (online): EUR 550 / person

In-company: On demand

Different geostatistical approaches to translate seismic time measurements into accurate depth models

Application 4: Mapping continuous properties (45′)

Kriging methods (ordinary and with local parameters), integration of auxiliary and uncertain data or data defined by intervals, multivariate mapping, and regional 3D modeling.

Application 5: 3D facies modelling (45′)

Facies proportion modeling, incorporating seismic data, considering diagenesis and sedimentological concepts, modeling of physical processes: the example of meandering channelized systems, and hybrid modeling workflows.

Application 6: 3D petrophysical property modeling (40′)

Property mapping, conditional modeling to the facies, handling border effects, and integrating hydrological connectivity.

Application 7: Uncertainty quantification (40′)

Understanding kriging variance, using simulation outputs for volumetrics, risk curves, and probability mapping (to be above a threshold or part of a reservoir or a facies)

Conclusion & Discussion (20′)

Practical deployment of geostatistics and next steps for operational use

WHY ATTEND?

- **Global perspective**: From seismic data processing to reservoir uncertainty, this seminar shows how geostatistics integrates across reservoir workflows.
- **Engaging format**: Learn through a mix of conceptual insights, illustrative case studies, and open discussions.
- **Accessible to all**: No prerequisites required — this seminar is designed to raise awareness and build understanding, not to teach hands-on techniques.

WHO SHOULD ATTEND

Ideal for project managers, decision-makers, and technical leaders seeking a concise introduction to geostatistical methods in reservoir characterization.

Boost your proficiency
in Isatis.neo and Isatis.py

Isatis.neo Fundamentals

Get up to speed with Isatis.neo: learn to navigate and apply core features with ease.

OBJECTIVES

Isatis.neo offers a streamlined, powerful environment for exploring spatial data, creating accurate models, and easily quantifying uncertainty. This course ensures that, in just one day, you'll feel confident in boosting your analysis and incorporating best-practice geostatistics into your daily projects.

COURSE CONTENT

- **Isatis.neo overview**

  Navigate the intuitive user interface, 3D viewer, Python-powered calculator, and batch automation tools.

- **Data import**

  Import diverse data types, including points, block models, and wireframes, and prepare datasets for analysis.

- **Data analysis**

  Perform robust exploratory data analysis (EDA): QC with histograms, scatter plots, anisotropy analysis, outlier detection, trend analysis, and variography (2D & 3D).

- **Estimation**

  Conduct estimation workflows including neighborhood analysis, kriging (point and block), cross-validation, and model validation.

- **Conditional simulations**

  Get an introduction to conditional simulations to better assess uncertainty.

OUTLINES

- **Hands-on software training**: Practice with real-world datasets and receive a temporary Isatis.neo license.
- **Personalized feedback**: Receive individualized guidance and feedback from experienced trainers during online sessions to support your learning journey.

DURATION

7 hours / 1 day

LEVEL

Basic

TYPE

Practice

MODES

Online or in-person course

Open or in-company sessions

PRICE

Open session (online): EUR 550 / person

In-company: On demand

- **Comprehensive resources**: Access detailed course materials, including documentation, journal files, and datasets, to reinforce learning and facilitate application post-training.

WHO SHOULD ATTEND

This course is ideal for professionals with a foundation in geostatistics who want to take full control of their spatial data workflows in Isatis.neo, whether you work in mining, petroleum, or environmental science.

PREREQUISITES

This course is dedicated to practical exercises with Isatis.neo, and no theoretical reminders about geostatistics will be provided. Participants are, therefore, required to have a fundamental knowledge of geostatistics.

Isatis.neo Scripting

Learn how to capitalize on Isatis.neo batch and Python capabilities to create repeatable workflows and perform customized calculations.

OBJECTIVES

Unlock the full potential of Isatis.neo and boost productivity by mastering batch mode and Python scripting. Learn to automate geostatistical workflows, tailor calculations, and apply targeting data processing.

The course consists of two modules that can be attended independently of each other.

COURSE CONTENT

Module 1: Working with batch files

Automate with ease – Learn how to record tasks and build workflows for mineral resource estimation that run seamlessly across multiple domains or variables:

- Understand the structure of batch files, including variables and arrays
- Record and automate processes using the batch recorder
- Build loops, conditional logic ("if" statements), and stopping rules to create flexible and robust workflows

Module 2: The Isatis.neo Python Calculator

Script customized calculations – Enhance your geostatistical modeling by leveraging Python scripting within Isatis.neo:

- Get introduced to the basics of Python scripting
- Import and apply popular Python libraries
- Write and execute scripts to implement your geostatistical routines
- Explore and experiment with different scripting modes and options

DURATION

Module 1: 3 hours / 0.5 day

Module 2: 3 hours / 0.5 day

LEVEL

Intermediate

TYPE

Theory and practice

MODE

Online or in-person course

Open or in-company sessions

PRICE

Open session (online): EUR 250 per module per person

In-company: On demand

OUTLINES

- **Hands-on software training**: Practice with real-world datasets and receive a temporary Isatis.neo license.
- **Personalized feedback**: Receive individualized guidance and feedback from experienced trainers during online sessions to support your learning journey.
- **Comprehensive resources**: Access detailed course materials, including documentation, journal files, and datasets, to reinforce learning and facilitate application post-training.

WHO SHOULD ATTEND

This training course is designed for any Isatis.neo user who wants to improve their automation and Python programming skills or optimize their workflows using Python's computing capabilities.

PREREQUISITES

Some familiarity with Isatis.neo is recommended, which you can gain by completing the "*Isatis.neo Fundamentals*" course. Prior experience with scripting or Python is helpful but not required.

Isatis.py Hands-on

Learn Python coding essentials and how to embed Isatis.py functions into your workflows.

OBJECTIVES

This course provides a practical introduction to **Python programming**, with a focus on geostatistical workflows using the high-performance **Isatis.py library**. You'll start by learning to **interpret and write Python scripts** (module 1), then apply them to real-world tasks such as **data preparation** and **Exploratory Data Analysis** (module 2), **variography** and **kriging** (module 3), **conditional simulations** (module 4), **multivariate modeling** (module 5), and **categorical variable modeling** (module 6). You'll also explore how to integrate **Isatis.py** into your projects to generate visuals, streamline processes, and efficiently manage large datasets, benefiting from its built-in multi-threading and parallel computing capabilities.

COURSE CONTENT

The course consists of six modules that can be attended independently of each other.

Module 1 – Introduction to Python

Kickstart your Python journey with this beginner-friendly course. Learn to interpret and write Python scripts, integrate Isatis.py tools, and automate geostatistical tasks to boost productivity and streamline your workflows.

- **Working in a Python environment**: exploring the basics of Anaconda and Python.
- **Variables and arrays**: defining variables and arrays for easy application to various domains or datasets.
- **Control structures**: automating workflows using loops and conditional statements.
- **Library management**: installing and leveraging external Python libraries for enhanced functionality.
- **Task automation**: recording simple tasks to streamline repetitive computations as input data is updated, or for auditing purposes.

DURATION

3 hours per module

LEVEL

Intermediate

TYPE

Theory and practice

MODE

Online or in-person course

Open or in-company sessions

PRICE

Open session (online): EUR 250 per module per person

In-company: On demand

Module 2 – Exploratory Data Analysis

Learn to embed Isatis.py tools for **data analysis**, **transformation**, and **visualization** into Python scripts. You will cover the following topics:

- 2D and 3D data visualization
- Declustering
- Principal Component Analysis (PCA)
- Desurveying and compositing
- Contact analysis

Module 3 – Kriging

Learn to embed Isatis.py tools for **variography** and **kriging** into Python scripts. You will cover the following topics:

- Analysis of spatial continuity using variograms
- Simple kriging
- Ordinary kriging
- Estimation validation
- Selection from polygons

Module 4 – Continuous Simulations

Learn to embed Isatis.py tools for **continuous variable simulations** and **uncertainty quantification** into Python scripts. You will cover the following topics:

- Selection from meshes
- Anamorphosis
- Big data management (through HDF5 files)
- Turning Bands Simulations
- Sequential Gaussian Simulations
- Block versus point simulations
- Simulation validation
- Simulation with local anisotropies
- Uncertainty visualization

Module 5 – Multivariate Estimation

Learn to embed Isatis.py tools for **multivariate estimation** and **simulation** into Python scripts. You will cover the following topics:

- Ordinary co-kriging
- Rescaled co-kriging
- Multivariate simulations
- Multivariate data imputation
- Projection Pursuit Multivariate Transform (PPMT)
- Reproducing complex multivariate relationships

Module 6 – Indicator Estimation and Simulation

Learn to embed lsatis.py tools to **estimate and simulate categorical variables**, and generate facies models, within Python scripts. You will cover the following topics:

- Indicator kriging
- Plurigaussian Simulations
- Sequential Indicator Simulations

OUTLINES

- **Hands-on software training**: Engage in computer-based exercises using lsatis.py, reinforcing learning through real-world data scenarios.
- **Personalized feedback**: Receive individualized guidance and feedback from experienced trainers during online sessions to support your learning journey.
- **Comprehensive resources**: Access detailed course materials, including documentation, Python script files, and datasets, to reinforce learning and facilitate application post-training.

WHO SHOULD ATTEND

Designed for geologists, geoscientists, and data scientists seeking to develop their skills in creating customized, flexible, and efficient geostatistical workflows using Python scripts and the lsatis.py library.

PREREQUISITES

Except for the first module, which introduces Python coding, prior experience with Python scripting is required. A solid background in practical geostatistics is also recommended.

2026 Training Schedule

2026 Sessions

- *Machine Learning Applied to* Geosciences
  April 7-9
  October 12-14
- *Geological Modeling by Geostatistics*
  June 1-3
  November 16-18
- *Multiple-Point Statistics Simulations with Isatis.neo - MPS*
  June 8-11 (4 half-days)
  December 7-10 (4 half-days)
- *Data Analysis, Mapping, and Subsurface Property Modeling with Geostatistics*
  September 14-15

ⓘ Note that the following courses are available **upon request**:

- Practical courses: *Isatis.neo Fundamentals*, *Isatis.neo Scripting*, and

- *Isatis.py* Hands-on.
- Oil & Gas dedicated courses: *Seismic Data Filtering and Depth Conversion with Geostatistics*, *Advanced Geostatistics for Reservoir Characterization*, and *An Overview of Geostatistics for the Oil & Gas Industry*.

ⓘ All our courses can be offered in **French** if there is sufficient demand from participants.

DATAMINE

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