



SCIENCES
TO ENHANCE YOUR RESOURCES

2019 TRAINING COURSES CATALOGUE

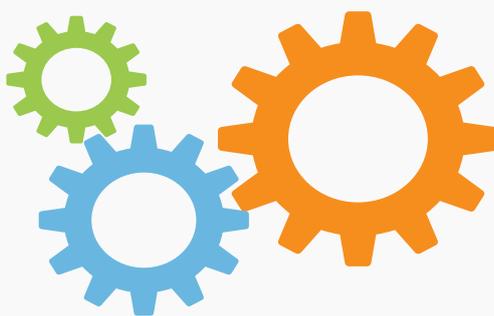
PROCESS ENGINEERING

SAMPLING
MATERIAL AND FLOWS CHARACTERISATION
METALLURGICAL ACCOUNTING
MATERIAL BALANCE
MODELLING AND SIMULATION
PIPING NETWORK DESIGN

MINERAL

AGRO-INDUSTRIES

WASTE



Online 2019 training courses catalogue
www.caspeo.net - +33 2 38 64 31 96





SCIENCES
TO ENHANCE YOUR RESOURCES

2019 training courses calendar

Sampling with ECHANT software

- February 5-6
- September 17-18

Sampling & measurement error calculation for insurance and quality control

- February 7
- September 24

Material balance with BILCO software

- March 5-6
- October 15-16

Metallurgical accounting

- March 12-13
- November 13-14

Process modelling and simulation with USIM PAC software

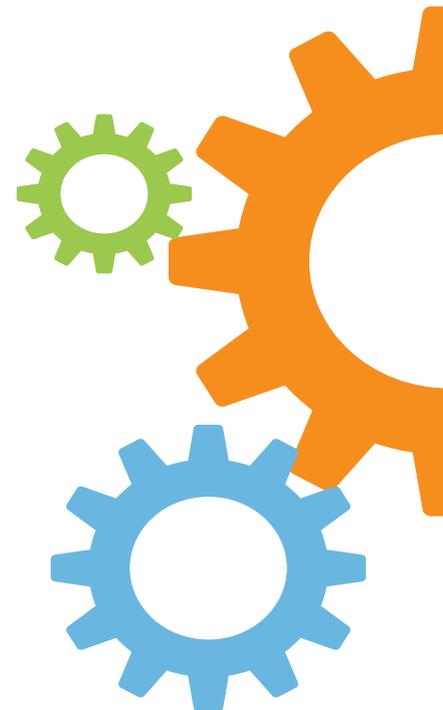
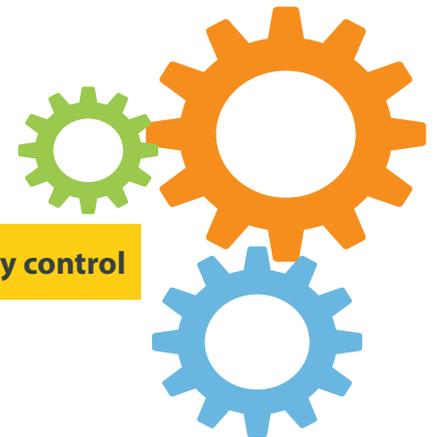
- March 19-21
- November 19-21

Process modelling and simulation with USIM PAC Agro software

- March 25-26
- November 25-26

Piping network design with FluidFlow software

- May 20-21
- December 2-3



CUSTOMIZED TRAINING
info@caspeo.net
+33 2 38 64 31 96



SCIENCES
TO ENHANCE YOUR RESOURCES

TRAINING

Sampling with ECHANT software

OBJECTIVE

Introduction to ECHANT software for fundamental sampling error estimation

INTENDED AUDIENCE

Process engineers, technicians concerned by sampling and measurement for process audit, site diagnostic and material characterisation

OUTLINE

Introduction

What is "sampling"

- Generalities
- Sampling quality
- Sampling error approach
- Material heterogeneity

Pierre Gy's theory

- Fundamental Sampling Error (FSE)
- Application fields

Case studies

- Calculation of fundamental sampling errors for various types of materials
- Different cases of sampling plans

Training evaluation

TEACHING METHODS

- Training is based on documents given to the trainees.
- Using the ECHANT software, trainees will apply the theory to solve industrial case studies.

PREREQUISITES

- Use of spreadsheet software (such as Microsoft Excel)

DURATION

1.5 day

REGISTRATION FEE

990 € (excl. taxes)

DATES

- February 5-6, 2019
- September 17-18, 2019

VENUE

Orléans, France

ADVANTAGES

- Theoretical and practical approach
- Training in French, English or Spanish



REGISTER

info@caspeo.net

+33 2 38 64 31 96



TRAINING

Sampling and measurement error calculation for insurance and quality control

OBJECTIVE

Estimate overall errors for moisture and particle size distribution analyses

INTENDED AUDIENCE

Process engineers, technicians concerned by material characterization (quality control, plant survey and site diagnostic)

OUTLINE

Measurements and their sources of uncertainty

- Measuring moisture content and particle size distribution
- Overview of the standards
- Origins of measurement uncertainty and variability

Estimate the measurement error

- Components of the total measurement error – application to moisture content and particle size distribution
- Weighing error calculation
- Sampling error for moisture
- Sampling error for particle size distribution
- Analytical error of size distribution proportions for a simple case
- Uncertainty range for a size distribution
- Measurement error for parameters such as mean size, d80 or d95, dispersion

Case studies

- Calculation of the total measurement error of the moisture content and particle size distribution for various materials and measurement methods
- Design of a sampling and measurement plan for moisture content and particle size distribution to meet tolerance requirements
- Design of a sampling plan for the size distribution measurement of a coarse material
- Case of stocks or material stream

TEACHING METHODS

- Training is based on documents given to the trainees.
- Several real cases, using spreadsheet, illustrate the theoretical presentations.

PREREQUISITES

- Use of spreadsheet software (such as Microsoft Excel)
- Knowledge of methods for measuring moisture content and particle size distribution
- Basic knowledge of sampling issues

DURATION

1 day

REGISTRATION FEE

750 € (excl. taxes)

DATES

- February 7, 2019
- September 24, 2019

VENUE

Orléans, France

ADVANTAGES

- Approach based on real cases
- Training in French, English or Spanish



REGISTER

info@caspeo.net

+33 2 38 64 31 96



SCIENCES
TO ENHANCE YOUR RESOURCES

TRAINING

Material balance with BILCO software

OBJECTIVE

initiation to BILCO software: data reconciliation by material balance

INTENDED AUDIENCE

Process engineers, technicians, students concerned by material balance problems

OUTLINE

Introduction

- Data reconciliation
- Material balance through an example
- Necessary data (material description, experimental measurements, material conservation constraints)
- Notion of measurement error
- BILCO calculation algorithm
- Results analysis

Case study: Global plant analysis

- Initialisation and data input functions
- Implementation of the calculation algorithm
- Results display and interpretation

Case studies

- Material balance computation on complex industrial cases
- Chemistry-mineralogy reconciliation
- Environmental impact assessment
- Recycling
- Customized cases

TEACHING METHODS

- Training is based on documents given to the trainees
- Using the dedicated BILCO software, trainees will apply the theory to solve material balance problems

PREREQUISITES

- Computing: Use of spreadsheet software (such as Microsoft Excel)
- Process: Basic notions on main equipment, physical and chemical process

DURATION

2 days

REGISTRATION FEE

1250 € (excl. taxes)

DATES

- March 5-6, 2019
- October 15-16, 2019

VENUE

Orléans, France

ADVANTAGES

- Approach based on real cases
- Training in French, English or Spanish



REGISTER

info@caspeo.net

+33 2 38 64 31 96



SCIENCES
TO ENHANCE YOUR RESOURCES

TRAINING

Metallurgical accounting

Principles, main applications and practical implementation

OBJECTIVE

Introduction to the main features of a metal accounting system through practical examples

INTENDED AUDIENCE

Process and production engineers, Financial managers, Laboratory managers, Quality controllers

OUTLINE

Introduction: Why metallurgical accounting?

The AMIRA code and its consequences

Definitions and theory

- Data reconciliation by material balance
- Granularity
- Periodicity and scenarios
- Data workflow and validation

Practical implementation

- Life cycle of a metallurgical accounting system
- Measurement and data management
- Data storage and inventory
- Improvement of granularity
- Implementation case with the INVENTEO solution

Main applications

- Critical case of smelters
- Mine to mill
- Aluminium refinery

TEACHING METHODS

- Training is based on documents given to the trainees.

PREREQUISITES

- Use of spreadsheet software (such as Microsoft Excel)
- Be involved/interested in material balance and metal accounting

DURATION

1,5 day

REGISTRATION FEE

990 € (excl. taxes)

DATES

- March 12-13, 2019
- November 13-14, 2019

VENUE

Orléans, France

ADVANTAGES

- Theoretical and practical approach
- Training in French, English or Spanish



REGISTER

info@caspeo.net

+33 2 38 64 31 96



SCIENCES
TO ENHANCE YOUR RESOURCES

TRAINING

Process modelling and simulation with USIM PAC software

For mineral industry applications

OBJECTIVE

Discovering the USIM PAC software functionalities for design and optimization

INTENDED AUDIENCE

Process engineers, technicians, students concerned by process design and optimization

OUTLINE

Introduction

General presentation of USIM PAC software

- Functions/How to use it? / Data structure
- «Guided tour»
- Data input and result display functions

Modelling and simulation of grinding / classification circuits

- Case study #1: Preliminary design of a grinding circuit

Mass balance reconciliation

- Principle/Data used/Algorithm
- Examples

Modelling and simulation of a concentration circuit

- Case study #2: Optimization of a grinding and flotation circuit

Other case studies (selection based on attendees profile)

TEACHING METHODS

- Training is based on documents given to the trainees
- Using specialized software products, trainees will apply the theory to solve industrial case studies

PREREQUISITES

- Computing: Use of spreadsheet software (such as Microsoft Excel)
- Process: Basic notions on main equipment, physical and chemical process of mineral

DURATION

3 days

REGISTRATION FEE

1780 € (excl. taxes)

DATES

- March 19-21, 2019
- November 19-21, 2019

VENUE

Orléans, France

ADVANTAGES

- Practical approach of simulation
- Training in French, English or Spanish



REGISTER

info@caspeo.net

+33 2 38 64 31 96



SCIENCES
TO ENHANCE YOUR RESOURCES

TRAINING

Process modelling and simulation with USIM PAC Agro software

For agro-industries applications

OBJECTIVE

Discovering the USIM PAC Agro software functionalities for design and optimization of agro-industries process

INTENDED AUDIENCE

Process engineers, technicians, students concerned by process design and optimization of biorefineries and food processes

OUTLINE

General presentation of USIM PAC Agro software

- Main functions
- «Guided tour»
- Modelling of material from living sources
- Presentation of the main unit operation models for agro-industries

Generation of a consistent and detailed mass balance from measured data

- Principles of data reconciliation by material balance / required data / algorithm
- Application example: material balance of a pilot operation for plants extraction

Sizing an industrial plant from pilot operation data

- Main equipment sizing
- Establishment of predictive material balances
- Investment and operation cost calculation

Existing plant optimization

- Equipment settings
- Improvement of material yields
- Optimisation of thermal exchanges

TEACHING METHODS

- Training is based on documents given to the trainees
- Using specialized software products, trainees will apply the theory to solve industrial case studies

PREREQUISITES

- Computing: Use of spreadsheet software (such as Microsoft Excel)
- Process: basic notions on main equipment, physical and chemical process of primary material from living sources (plants, algae, milk, sea...)

DURATION

2 days

REGISTRATION FEE

1250 € (excl. taxes)

DATES

- March 25-26, 2019
- November 25-26, 2019

VENUE

Orléans, France

ADVANTAGES

- Practical approach of simulation
- Training in French, English or Spanish



REGISTER

info@caspeo.net

+33 2 38 64 31 96



SCIENCES
TO ENHANCE YOUR RESOURCES

TRAINING

Piping network design with FluidFlow software

OBJECTIVE

Discover the FluidFlow functionalities for piping network design and pressure loss calculation

INTENDED AUDIENCE

Process engineers, technicians concerned by piping design and fluid networks optimization

OUTLINE

Introduction

Software Overview

- Basic equations and theoretical concepts
- Flowsheet building, data input, results display and analysis
- Main functionalities of the software for incompressible fluids calculations

Advanced use

- Database management (fluids, equipment, pipes, valves, materials...)
- Heat transfer calculation
- Combination or Mixing of Fluids
- Compressible Flow
- 2-Phase Liquid/Gas

Non-Newtonian & Settling Slurry calculation

- Non-Newtonian/non-settling liquids: theoretical concepts implemented in the software
- Case studies with non-Newtonian fluids
- Case studies with settling slurries

Teaching methods

- Training is based on documents (slides and teaching aid) given to the trainees
- The trainees will apply the theory to solve a wide range of practical case studies with the software

TEACHING METHODS

- Training is based on documents (slides and teaching aid) given to the trainees
- The trainees will apply the theory to solve a wide range of practical case studies with the software

PREREQUISITES

- Basic knowledge of fluid mechanics

DURATION

2 days

REGISTRATION FEE

1250 € (excl. taxes)

DATES

- May 20-21 2019
- December 2-3 2019

VENUE

Orléans, France

ADVANTAGES

- Practical approach of fluidflow networks
- Training in French or English



REGISTER

info@caspeo.net

+33 2 38 64 31 96



SCIENCES
TO ENHANCE YOUR RESOURCES

Our animators, all experts in process engineering

STEPHANE BROCHOT, PhD

Graduate from the University of Orleans-Tours (France), he obtained his doctorate (PhD) in 1990 and completed his education with a master in mathematical engineering and computer processing techniques. He joined BRGM in 1991 as researcher in process analysis for the design and optimisation of solid processing plants (ores, contaminated soils, wastes). In 2004, he created Caspeo, a spin-off of BRGM, and since, has been one of the co-managing director as the scientific and technical manager. He has animated lots of training sessions in many countries and is giving courses in several Universities.

MARIE-AMELIE DE VILLE D'AVRAY, PhD

Graduate from the French "Agroparistech" engineering school in Food Processing and Science, she joined Caspeo in 2005. In 2010, she obtained her Ph.D. in Process Engineering, specializing in the mathematical modelling and simulation of industrial processes. Since 2012, she animates FluidFlow and USIM PAC Agro training sessions.

MARIE-VERONIQUE DURANCE

Graduate from the French National Engineering School of Geology (1990) and from the Business Administration Institute (2000), she worked for BRGM from 1991 to 2003 as an international project manager in the field of process audit and development for the mineral and environmental industry. In 2004, she created Caspeo, a spin-off of BRGM, and since, has been one of the co-managing director. Besides the general management of the company Marie-Véronique DURANCE keeps commercial and technical roles. She has animated lots of training sessions in many countries.

PHILIPPE WAVRER, PhD

Graduate from the University of Nancy (France), he defends a PhD thesis in 1996 about the adaptation of Pierre Gy's theory of sampling to waste and contaminated soils. Philippe joined Caspeo in September 2014 and is in charge of market development in the field of waste. Engineer then Project manager during 20 years at BRGM, the French Geological Survey, he is specialized in the characterization and treatment of domestic and industrial waste. Meanwhile, he has also animated training sessions or university courses about sampling. He brings to Caspeo his competency in sampling, a deep knowledge of the French and European actors and contribute to the definition and guidance of the Caspeo R&D in the waste field.



REGISTER

info@caspeo.net

+33 2 38 64 31 96



SCIENCES
TO ENHANCE YOUR RESOURCES

REGISTRATION FORM

To send back by e-mail or postal mail

Tel : +33 2 38 64 31 96 - E-mail : info@caspeo.net

CASPEO - 3 Avenue Claude Guillemin - BP 36009 - 45060 ORLEANS CEDEX 2 - FRANCE

INFORMATION ABOUT THE TRAINING SESSION

Training session

Date

Price

How did you hear about it?

COMPANY INFORMATION

Name

Address

Zip code

City

Country

VAT No
(for European country)

PARTICIPANT INFORMATION

Name

Surname

Position

Phone

E-mail

Name

Surname

Position

Phone

E-mail

Date

Signature

For any cancellation, less than 10 days before the start of the training session, 50% of the price will be invoiced.

CASPEO - 3 Avenue Claude Guillemin - BP 36009 - 45060 ORLEANS CEDEX 2 - FRANCE

Tel : +33 (0)2 38 64 31 96 - E-mail : info@caspeo.net

SARL au capital de 44 660 €. RCS Orléans - SIRET 451 785 687 00018