Flotation Techniques Training Course

Professional Development Training Course Outline

Category	General Training	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

The Flotation Techniques Training Course is designed to build advanced competency in froth flotation, mineral processing, and metallurgical recovery optimization. This training equips participants with cutting-edge knowledge in ore beneficiation, reagent chemistry, bubble-particle interaction, and process control systems used in modern mining operations. With increasing demand for critical minerals such as copper, lithium, nickel, and gold, flotation remains a core separation technology driving efficiency, sustainability, and profitability in mineral processing plants.

This course integrates practical and theoretical learning aligned with global ESG mining standards, digital mining transformation, and process automation trends. Participants will gain hands-on exposure to flotation circuit design, troubleshooting, and optimization strategies to maximize recovery rates, concentrate grade, and operational efficiency. The program is structured to support engineers, metallurgists, and plant operators in mastering next-generation flotation systems used in both base metal and precious metal industries.

Programme Curriculum

Flotation Techniques Training Course

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Course Duration

5 days

Course Objectives

1. Understand fundamentals of froth flotation process engineering
2. Optimize mineral recovery and grade control strategies
3. Analyze bubble-particle interaction dynamics
4. Apply flotation reagent chemistry and dosage optimization
5. Improve copper, gold, and lithium recovery efficiency
6. Design efficient flotation circuit configuration and flowsheets
7. Identify and troubleshoot plant bottlenecks and inefficiencies
8. Implement process automation in mineral flotation plants
9. Apply advanced mineral liberation analysis techniques
10. Enhance sustainability and ESG compliance in mining operations
11. Utilize real-time process control and digital monitoring tools
12. Reduce operational costs through energy-efficient flotation practices
13. Develop competency in industrial-scale metallurgical optimization

Target Audience

1. Mineral Processing Engineers
2. Metallurgical Engineers
3. Mining Operations Supervisors
4. Process Plant Operators
5. Geology and Exploration Professionals
6. Chemical Engineers in Mining Sector
7. Technical Consultants in Metallurgy
8. Mining Engineering Students & Graduates

Course Modules

Module 1: Fundamentals of Froth Flotation

- Principles of particle separation and surface chemistry
- Hydrophobicity and hydrophilicity behavior
- Air bubble generation mechanisms
- Mineral surface modification techniques
- Case Study: Copper flotation efficiency improvement in a concentrator plant

Module 2: Mineralogy and Ore Characterization

- Ore texture and mineral liberation analysis
- Gangue vs valuable mineral separation behavior
- Particle size distribution effects

- Mineralogical variability in feed ore
- Case Study: Gold ore variability impacting recovery rates

Module 3: Flotation Reagents and Chemistry

- Collectors, frothers, and depressants function
- pH modifiers and chemical balancing
- Reagent dosage optimization techniques
- Environmental impact of flotation chemicals
- Case Study: Reduction of reagent cost in nickel flotation circuit

Module 4: Flotation Circuit Design

- Rougher, scavenger, and cleaner stages
- Circuit configuration optimization
- Residence time distribution
- Scalability from lab to industrial plants
- Case Study: Plant redesign increasing lithium recovery efficiency

Module 5: Process Control and Automation

- Sensors and real-time monitoring systems
- SCADA systems in flotation plants
- AI and machine learning in mineral processing
- Stability control in fluctuating feed conditions
- Case Study: AI-based control improving copper grade consistency

Module 6: Troubleshooting and Optimization

- Froth stability issues and solutions
- Pulp density and airflow adjustments
- Recovery loss diagnostics
- Equipment wear and performance issues
- Case Study: Resolving low gold recovery in tailings stream

Module 7: Sustainability and ESG in Flotation

- Water recycling and conservation strategies
- Tailings management best practices
- Energy-efficient flotation operations
- Regulatory compliance frameworks
- Case Study: ESG-driven water reduction in a platinum mine

Module 8: Advanced Flotation Technologies

- Column flotation systems
- Microbubble and nanobubble technology
- Hybrid flotation systems
- Next-gen reagent innovations
- Case Study: High-efficiency rare earth element separation

Training Methodology

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

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