



# AFRICAN MINERALS AND GEOSCIENCES CENTRE (AMGC)

## LIST OF TRAINING COURSES – 2020/21

Training Topics	Description	Duration	Tentative Schedule	Fee
<b>Chemical and Environmental Services</b>				
<b>Spectrometric Methods of Analysis.</b>	Theory, operation and maintenance Atomic Absorption Spectrometers (AAS) and X-Ray Fluorescence (XRF).	2 Weeks	13-24 Jul 2020 12-23 Oct 2020 09-20 Nov 2020 18-29 Jan 2021 15-26 Mar 2021 10-21 May 2021	\$800
<b>Analysis of Gold and Other Base Metals</b>	Analysis gold and other base metals with a view to wet and dry techniques.	2 Weeks	10-21 Aug 2020 14-25 Sep 2020 7-18 Dec 2020 8-19 Feb 2021 12-23 Apr 2021 14-25 Jun 2021	\$800
<b>Mineralogy, Petrology and Gemmology Services</b>				
Mineralogical and Petrological Sample Preparation and Analytical Techniques	Thin section preparation, Polished section preparation, Petrographic examination	2 Weeks	13-24 Jul 2020 5-16 Oct 2020 11-22 Jan 2021 5-16 Apr 2021	\$800
Gemstone Identification Techniques	Physical and optical properties of gemstones, working principles of gemmological tools and equipment, Testing and identification of gemstones, Treatments, Quality grading, Synthetic stones	1 Week	3-7 Aug 2020 26-30 Oct 2020 1-5 Feb 2021 26-30 Apr 2021	\$400

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Gemstone Value Addition Techniques	Rough gemstone sorting and grading, different techniques for gemstone cutting (faceting, capping and free form carving), evaluation of cut stones	2 Weeks	10-21 Aug 2020 2-13 Nov 2020 8-19 Feb 2021 3-14 May 2021	\$800
<b>Industrial Minerals Application Services</b>				
<b>Pottery for Beginners</b>	Introduction to pottery and ceramics, Classification of pottery and ceramic products, Raw materials used, Identification of raw materials, Raw materials preparation and basic forming methods	2 Weeks	13-24 Jul 2020 10-21 May 2020	\$800
<b>Mould Making</b>	Material used for modelling and mould making, Preparation of plaster of Paris, Shrinkage calculations and drawings enlargement, Model making, Mother mould making, Case mould making,	2 Weeks	10-21 Aug 2020	\$800
<b>Forming Techniques</b>	Hand building, Coiling, Slip casting-deflocculants, Solid and hollow casting, Thixotropy, Jigger & Jollying, Pressing, Throwing	2 Weeks	21 Sep - 2 Oct 2020	\$800
<b>Decorations in Pottery and Ceramics</b>	Understanding ceramic oxides, Colour blending and firing temperature, types of decorations – inlaying, sigraffito, stenciling, Glazing, Decor transfer, Engobe preparations	2 Weeks	9-20 Nov 2020	\$800
<b>Bricks &amp; Tiles Manufacturing [Clays]</b>	Introduction to bricks and tiles, raw materials, preparation, forming ,drying and firing by using simple methods	2 Weeks	1-12 Feb 2021	\$800
<b>Glaze Formulation</b>	Introduction to glaze, Glaze components – oxides, alumina & fluxes, What determines glaze firing temperature, Selection of raw materials for glaze, Glazing rules and techniques, Glaze defects and remedies	2 Weeks	1-12 Mar 2020	\$800
<b>Body Composition Formulation</b>	Single raw material test, shrinkage test, Porosity test, the function of alumina and fluxes in the body ,Triaxial blending	2 Weeks	12-23Apr 2021	\$800
<b>Mineral Processing and Small-scale Mining Services</b>				
<b>Practical Mineral Processing and The Basic Mineral Processing Flowsheet</b>	The course covers fundamental principles and terminology with broad overview of current technical and operating issues and circuit design considerations. Topics covered include; introduction to mineral processing, comminution and liberation, classification; mineral concentration methods (gravity, flotation and magnetic); and solid/liquid separation.	2 Weeks	13-24 July 2020 7-18 Dec 2020	\$800

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<b>Sampling and Sample Preparation for Laboratory Testing</b>	Sampling, sample preparation and analysis of environmental and geological samples. It provides an understanding of the sampling theory, types of sampling and sampling protocols, involved analytical measurement, composition and classification; sampling quality control; and assays methods	2 Week	03-14 Aug 2020 11-22 Jan 2021	\$800
<b>Artisanal and Small Scale Mining Activities</b>	To provide ASM operators with technical, management and environmental knowledge for sound improvement of their activities. Particular emphasis is on importance of application of improved technics and use of geological data of deposits in environmentally friendly ways for sustainable ASM Activities. Impacts of ASM like mercury pollution, cyanide pollution, direct dumping of tailings and effluents into rivers, threats from improperly constructed tailings dams, river damage in alluvial areas, erosion damage and deforestation, and landscape destruction.	2 Weeks	31 Aug -11 Sep 2020 01-12 Feb 2021	\$800
<b>Techniques of Gold Cyanidation</b>	Detailed accounting of the usage of cyanide for extraction and recovery of gold, and of cyanide toxicity and chemistry. It covers cyanide leaching techniques and gold purification and recovery from solution methods.	1 Week	21-25 Sep 2020 22-26 Feb 2021 24-28 May 2021	\$400
<b>Mineral Economics</b>	Fundamental aspects of the evaluation of mineral investments from examining the mining stages with particular emphasis on cash flow models and project acceptance and rejection criteria. This course also examines the basic approaches and methods of developing evaluations for mineral projects and techniques for risk assessment.	2 Weeks	12-23 Oct 2020 22 Mar – 02 Apr 2021	\$800
<b>Metallurgical Balance and Process Evaluation</b>	The distribution of the various products of a concentrator, and the values contained in them. It provides a basis for decisions making about the mineral processing operations since the values of recovery and grade obtained from the accounting procedure are indications of process efficiency	2 Weeks	02-13 Nov 2020 12-23 Apr 2021	\$800
<b>Extractive Metallurgy – Metallic Ore Deposits, Metal Extraction and Purification Processes</b>	The course deals with ores as raw material and metals as finished products. It covers the introduction to metallurgy, occurrences and properties of metallic ores, uses and commercial classification of metals, metal production and recycling	2 Weeks	03-14 May 2021	\$800

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<b>Environmental Management in Mining</b>	The negative impacts which could arise from the exploration, operation and decommissioning phase of any mining project small, medium or large scale. It covers topics related to Water Management, Land and biodiversity Management, Waste Management and Air pollution.	1 Week	23-27 Nov 2020 07-11 Jun 2021	\$400
<b>Geo-information Services</b>				
<b>GIS and Remote Sensing for Mineral Exploration and Geological Mapping</b>	Geological interpretation of satellite images, to enabling the participant to relate the geological structure and lithology with their geomorphological manifestation. Fundamentals of remote sensing including principles of electromagnetic radiation is needed. Various band combination, band ratios and enhancements techniques for visual interpretation and feature extraction by quantitative methods will be deployed to aid in lithology, structures and hydrothermal alteration zones delineation. The project work will use various types of remote sensing data products over different types of terrain, aims at providing high level of confidence to individual trainee to carry out their assignments in the elated fields in their respective countries.	2 weeks	19-30 Oct 2020 15-26 Feb 2021	\$800
<b>Data Integration and Mineral Targeting</b>	GIS-based spatial data processing, analysis, visualization, and decision-making. The course includes exercises and case studies with the view to develop skills in data capture, data integration, digital mapping, raster and vector geoprocessing, spatial analysis and modeling, and use of GIS as a data management and decision-making tool in earth science. Use of GIS in site suitability analysis and Mineral Prospectivity Mapping using Boolean, Index Overlay, and Fuzzy Logic overlays	2 weeks	22 Sep - 2 Oct 2020 22 Mar - 2 Apr 2021	\$800
<b>Geostatistics Application in Geology</b>	Practical experience of using the statistical environment and packages in <b>R</b> for exploratory analysis variogram estimation and modelling and optimal estimation of sample values at unsampled sites using kriging.	2 weeks	5-16 Oct 2020 19-30 Apr 2021	\$800

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<b>Mineral Exploration and Resource/Reserve Estimation</b>	<p>Introduction to Exploration, Evaluation and Extraction (Mining) of mineral resources. Mineral Exploration Methods, reconnaissance survey, Geological Mapping, Geochemical survey and Geophysical survey. Data integration, analysis and interpretation of results for target areas identification.</p> <p>Resource/reserve estimation with data collection and handling, data quality, data handling and data validation, and data analysis and interpretation. Statistical methods of resource/reserve estimation, generate block model, block size selection, coding block model and block model parameters. Estimation concepts, estimations techniques, grade calculation and model validations.</p> <p>Mineral resource classifications and Reporting. Reporting code, sign off, external auditing and case study.</p>	2 weeks	31 Aug - 11 Sep 2020 2-13 Nov 2020 11-22 Jan 2021 1-12 Mar 2021 3-14 May 2021	\$1,500
<b>Advanced Resource Estimation</b>	<p>This course takes a practical approach <b>for real-life data set</b> to training you how and when to apply use linear estimation techniques like <b>Simple Kriging (SK)</b> and <b>Co-Kriging (CK)</b>. Non-linear estimation techniques such as <b>Multiple Indicator Kriging (MIK)</b> and <b>Conditional Simulations (Sequential Gaussian Simulation (SGS) and Sequential Indicator Simulation (SIS))</b>. Participants will produce resource estimates using these techniques and compare and discuss the results.</p>	1 week	14-18 Sep 2020 16-20 Nov 2020 25-29 Jan 2021 15-19 Mar 2021 17-21 May 2021	\$1,000
<b>Web mapping</b>	<p>Preparation of maps for presentation and display on internet. This include designing of web interface, coding and preparation of web maps, web mapping standards, and setting up of web and mapping servers. Different web mapping services: WMS, WFS, WCS using open source mapping applications.</p>	2 weeks	19-30 Oct 2020 5-16 Apr 2021	\$800
<b>Geohazards</b>	<p>Natural hazards related to earth phenomenon are intrinsically related with geosciences. Study of these geoscience phenomena is a path to the mitigation and prevention of the hazardous events on our environment. This course details the causes of geohazards, and possible prevention mechanism.</p>	1 week	23-27 Nov 2020 24-28 May 2021	\$400

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<b>Open Source GIS</b>	<p>The widely used GIS applications are proprietary software packages which are very expensive. Due to this a number of Open Source and Free GIS applications have been developed. Some of these applications have grown to be strong and has ability to perform the applications the commercial software are able to do and provide solutions for most of GIS related problems.</p> <p>QGIS and gvSIG are among the Open source and free GIS applications available. This course will enable the trainee to easily acquire and use these applications of GIS.</p>	2 weeks	6-18 Dec 2020 31 May - 11 Jun 2021	\$800
<b>Image Processing using ERDAS Imagine</b>	<p>In order properly use earth observation images it is important to have accurate geographical referencing and also to have images that display information that can be interpreted based on sound theory of reflectance.</p> <p>On completion of the course the successful student will:</p> <ul style="list-style-type: none"> <li>• understand the general image processing principles</li> <li>• be proficient in the use of ERDAS Imagine</li> <li>• understand and be able to undertake geometric referencing of images</li> <li>• understand and be able to display image composites for known purposes.</li> <li>• know about the potential and procedures for image processing in a range of application areas: mineral exploration, land use, environmental protection, geohazard and others</li> </ul>	2 weeks	1-12 Feb 2021 14-25 Jun 2021	\$800

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<b>Geoheritage sites of Tanzania</b>	The importance of Geoheritage and its geoscience significance is discussed in this geo-tourism event which describes the different geoheritage sites and geoparks available in Tanzania: the highest peak of Africa (the Kilimanjaro Mountain), The world only carbonatite volcano (Oldonyo Lengai), The cradle of mankind (Olduvai Gorge), and others. The even includes visit to these and other sites with scientific and touristic interaction.	Duration and cost vary on the number of sites to be visited.		
<b>Geo-safari – Geo-traverse across the Pan-African terrains: Tanzanian Craton, Greenstone belt, East African Rift Valley, the Kibaran and Mozambique belts.</b>		Duration and cost vary according to the selected geo-safari type.		