

**GUIDELINES FOR THE MINIMUM CORE COURSES FOR REGISTRATION IN THE CATEGORY:
MINE SURVEY TECHNICIAN**

	Knowledge Area	Outcome	Topic / Themes	Credits	%
1	Mathematics, Applied Mathematics and statistics	Ability to apply mathematics and statistics in solving mine survey problems	Trigonometry;co-ordinate geometry; Vectors; analytic geometry;matrices;determinants differentiation:partial differentiation,series;integrated solutions of first order differential equations;statistics and statistical analysis.	36	15
2	Physics	Understanding the principles of physics in mine survey practice, instrumentation and tecnology	Kinematics (linear and angular); Dynamics (Newton’s laws and applications, sliding and rolling friction); Work, power, energy, impulse and momentum; Elasticity; Hydrostatics (Fluids dynamics; Heat and heat transfer; Laws of Thermodynamics; Waves); Electricity (forces, fields and current circuits); Light (Optics-application in instrumentation)	6	3
3	Mine Surveying	Ability to execute standard mine surveying operations	Theory and Principles of Mine Surveying; Maps/Plans; Units of measure; Coordinate systems; Survey instrumentation and their use and adjustments; levelling, Gradient calculations; tacheometry; Area and Volume determination-Cut and fill; trangulation; resection; trilateration; traversing; Excentric stations	48	20
4	Information Technology	Ability to apply Information technology in standard mine survey applications	Computer literacy; Microsoft software packages; Drawing graphs; Introduction to computer aided drafting; Computer hardware and software; Information communication and presentation of survey results	24	10
5	Geographical Information Science	Abilty to apply Geo Spatial Information science Technology in solving standard mine survey applications	Geospatial information systems; maps and types of maps; cartographic design principals; visualisation; spatial interpolation.	6	3
7	Coordinate Systems and Map Projections	Understanding the principles of co ordinate systems and map projections in mine survey	2-D and 3-D coordinate systems; reference systems; shape of earth; map projections; SA Survey coordinates system; other co-ordinate systems.	12	5
8	Adjustments, Error Theory and Statistics	Recognise and adjust observational errors	The nature of observations and data acquisition, types of errors, means, accuracy, precision; Adjustment of a survey- and levelling traverse.	6	3
10	Business and project Management	Communicate and working in a project team within a mining environment	Develop an ability to communicate effectivley within the mining industry (Written,spoken); office and team management;theory of management.	6	3
11	Professional Practice and Ethics	Operate safely and within the mining Industry legal requirements	The MHSA and regulations -MPRDA; profession ethics; Geomatics Act and rules and regulations.	6	3
12	Category specific project	Demonstrate technical proficiency by producing a report	The project must have a design and/or analysis component and include reporting and presentation of final results	30	13

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15	3D Modelling / Cartography / Visualisation	Ability to produce visual data from captured sampling and survey information	Cartography; maps/plans and sections production; construction of mine plans and 3D representation	12	5
18	Mine Sampling	Ability to demonstrate sampling and valuation skills as required at a standard level	Sampling theory and procedures, sampling methods; Sampling reports; Averaging and weighing of sampling results; regular and irregular sampling intervals; Calculation of tonnage and mineral content; sampling reporting systems	18	8
19	Mineral Valuation	Ability to demonstrate mineral valuation skills as required at a standard level	Sampling and assay errors. Grade control; life of mine; pay limits; valuation of a mineral deposits; management control factors	12	5
20	Mining geology	Ability to apply geology knowledge in gathering sampling and survey data	Occurance of Minerals; physical geology; structural geology.	18	8
			Grand Total	240	100