

**GUIDELINES FOR THE MINIMUM CORE THEMES (STUDY AREAS) FOR REGISTRATION IN THE CATEGORY:**

**MINE SURVEY TECHNICIAN**

		Lectures
<b>Common Courses</b>		
<b>1</b>	<b>Mathematics and Applied Mathematics</b>	<b>100</b>
	algebra; trigonometry; calculus; complex numbers; co ordinate geometry; analytic geometry; matrices; determinants differentiation; partial differentiation, series; integrated solutions of first order differential equations; numerical methods; statistics.	
<b>2</b>	<b>Physics</b>	<b>20</b>
	Vectors; 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	
<b>3</b>	<b>Basic Surveying and Engineering Surveying</b>	<b>130</b>
	Theory and Principles of Surveying-Mine Surveying; Maps-Plans; Units of measure; Coordinate systems; Basic survey instruments and their use and adjustments; traversing; tape surveying; levelling-Cut and fill, Gradients calculations; tacheometry; Solution of triangles; Area and Volume determination; survey computer applications; triangulation; resection; trilateration; missing date calculations; satellite stations; surveying of ore passes; shaft surveying; curves; advanced survey instuments and data capture.	
<b>4</b>	<b>Information Technology</b>	<b>50</b>
	Introduction to computers; Microsoft software packages; Drawing graphs; Introduction to CAD; Computer hardware; computer software; Communication skills	
<b>5</b>	<b>Geo-Spatial Information Science</b>	<b>25</b>
	intrduction to geospatial information systems; maps and types of maps; catographic design principals; visualisation; spacial interpolation	
<b>7</b>	<b>Coordinate Systems and Map Projections</b>	<b>25</b>
	2-D and 3-D coordinate systems; grid reference systems; shape of earth; different types of map projections; SA Survey coordinates system	
<b>8</b>	<b>Adjustments, Error Theory and Statistics</b>	<b>30</b>
	The nature of observations and data acquisition, types of errors, means, norms, accuracy, precision; Adjustment of a survey and levelling traverse	

<b>9</b>	<b>Business and project Management</b>	<b>15</b>
	Develop an ability to communicate effectively within the mining industry( written communication, spoken communication, communication in the workplace); office organisation and methods; contracts ; theory of management	
<b>10</b>	<b>Professional Practice and Ethics</b>	<b>15</b>
	Introduction to the MHPA and Petroleum Act for surveying and sampling; introduction to the mining lease law, Samrec and Sanval codes; profession ethics; professional and technical surveyors act and registration.	
<b>11</b>	<b>Category Specific Research project</b>	<b>40</b>
	Report-Portfolio of evidence demonstrating practical skills: Sample a stope face-development (reef drive, raise, cross-cut); Compilation of a stope-development sampling record; Map a stope face/development end-Cartography and visualisation; Performance of broken ore sampling	
	<b>Category Specific Subject Areas</b>	
<b>15</b>	<b>3D Modelling / Cartography / Visualisation</b>	<b>25</b>
	Introduction to cartography; basic map production procedures; map design and representation; digital mapping	
<b>16</b>	<b>Mine Sampling and Valuation</b>	<b>100</b>
	Sampling theory and procedures (basic principles and definitions), sampling methods; Sampling reports; Averaging and weighing of sampling results; regular and irregular sampling intervals; weighing by length, area and mass; Calculation of tonnage and mineral content; ore flow; pay limits; grade control; life of mine; valuation of a mineral deposits; management control factors; present values and compound interest; taxation; borehole valuation; statistical valuation(distribution, probability and regression)sampling and valuation computer applications.reporting	
<b>17</b>	<b>Mining geology</b>	<b>25</b>
	mineralogy; physical geology; structural geology	
	<b>Grand Total</b>	<b>600</b>