

**GUIDELINES FOR THE MINIMUM CORE COURSES FOR REGISTRATION IN THE CATEGORY:**

**ENGINEERING SURVEYOR TECHNICIAN**

**COURSE**

<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-Engineering 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; satellite positioning; curves; advanced survey instruments and electronic data capture. Setting out of simple engineering structures	
<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>
	Introduction to geospatial information systems; maps and types of maps; basic cartographic design principles; visualisation; spatial interpolation	
<b>6</b>	<b>Photogrammetry and Remote Sensing</b>	<b>20</b>
	Electro-magnetic energy in remote sensing, Earth satellite orbits, geometry of sensors and sensor systems (airborne, spaceborne and terrestrial), camera calibration, acquisition of images (including flight planning), image media and formats incl. image compression, principles of analogue and digital photography, Ground Control	
<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 coordinate 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>20</b>
	Develop an ability to communicate effectively within the built environment (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>30</b>
	Introduction to the Land Survey Act and Regulations; introduction to land ownership; professional ethics; Professional and Technical Surveyors Act and registration with PLATO.	
<b>11</b>	<b>Category Specific Research project</b>	<b>40</b>
	Report-Portfolio of evidence demonstrating practical skills: Triangulation / GPS, Levelling, Traversing, Computer Applications, Cadastral Surveying, Topographical Surveying	
	<b>Category Specific Courses</b>	
<b>13</b>	<b>Geodesy and Satellite Surveying</b>	<b>15</b>
	Datum and datum shifts, global positioning satellite systems	
<b>14</b>	<b>Precise Engineering Surveying</b>	<b>30</b>
	Introduction to deformation surveys and monitoring	
<b>15</b>	<b>3D Modelling /Cartography/visualisation</b>	<b>20</b>
	Visual perception, graphicacy, cartographic communication (including information sense-making, information use and information-knowledge transformation), graphic space, symbology (point, line, area, pictorial, 3-D), colour, cartographic design, toponymy, generalisation, map use, multimedia mapping, 2-D and 3-D visualisation, interactive maps, Web maps, general purpose maps, relief representation, thematic maps (including statistical mapping), image maps, intellectual property rights and copyright, privacy rights, information economics, computer-assisted cartographic systems, map printing.	
<b>21</b>	<b>Selected core Themes and Electives ( Civil Engineering Construction)</b>	<b>20</b>
	Environmental awareness, construction safety, various methods of Civil Engineering Construction, building practice, construction plant, codes and Building Regulations	
<b>22</b>	<b>Further Time for Electives</b>	<b>20</b>
	<b>Grand Total</b>	<b>600</b>