## The Department of Land Surveying and Geo-Informatics

The Department of Land Surveying and Geo-Informatics (LSGI) is a leading academic organization for geomatics education and research.

The Department's focus is on acquisition, modeling, analysis, and management of spatially referenced data for a wide range of applications. These include map-making, navigation, monitoring of engineering projects and geological hazards, environmental monitoring, boundary determination and geographic information management.

The Department has a suite of well-equipped laboratories supporting study and research in the area of digital cartography, photogrammetry, remote sensing, geo-informatics, geodetic and engineering surveys. Students and researchers will be working with these state of the art facilities and internationally renowned teaching staff. They will have a variety of opportunities in both research and practical work.

Our graduates are able to apply theories in practice as our programmes are application oriented. Our research work is of an applied nature and is relevant to industrial, commercial and community needs. Through our partnerships and consultancy work with business and industry as well as our community service work, the Department maintains close relationships with the professions. Our research and courses are therefore oriented towards the needs of Hong Kong.

## The Department awards the following degrees and qualifications:

* Doctor of Philosophy / Master of Philosophy
* Master of Science in Geomatics
* Postgraduate Diploma in Geomatics
* Postgraduate-level subject-based Study
* Bachelor of Science (Honours) in Geomatics
* Higher Diploma in Geomatics

## Land Surveying

Land Surveying is the measurement and collection of data related to land features, both natural (mountains, valleys, rivers etc) and man-made (roads, buildings, etc). Based on the location and position of features, as well as their dimensions, and changes over time, land surveying can be categorized into:

* Topographical Surveying

all natural (mountains, valleys, rivers etc.) and man-made (roads, building etc.) features

* Cadastral Surveying

privately or publicly owned land parcels or properties

* Engineering Surveying

those related to construction of roads and buildings

* Hydrographical Surveying

water depth and features

There are various data collection techniques

* Total Station (Electronic Theodolite & Measuring Instrument)
* Deep Sea Echo Sounder and Laser Scanner
* Aerial Photogrammetry
* Satellite Imaging
* Global Positioning Systems

## Geo-informatics

Geo-informatics or Geomatics (where "Geo" refers to the land and "matics" refers to the mathematics and science) is a special kind of Information Technology (IT) which integrates the acquisition/collection, management, analysis, modeling and presentation of spatially referenced data related to land features. The related applications include those of:

* Land Surveying
* Digital Mapping / Automated Cartography
* Geographic Information Systems
* Virtual Reality

Modern cutting-edge technologies of metrology, navigation systems (GPS, GLONASS, GALILEO), utility surveying and management, cartography, geographical information systems (GIS), photogrammetry and remote sensing, and internet map design and delivery are being deployed. On the management side, the role of cadastral survey is to delineate precise and legal lot boundaries and hence supporting the land and property market.

The latest developments in Geomatics include three-dimensional modeling and visualisation, science and applications of location based services (such as the development of advanced mobile systems for navigation and service information provision), and internet spatial information delivery and service (such as Google maps).

## Utility Management and Surveying

Underground utility engineering, surveying and management is an emerging professional discipline in Hong Kong and elsewhere, where the new underground utility networks are getting much complicated and the old ones are aging. Since 2009, we launched our underground utility management and surveying specialism as one of the three streams in our BSc (Hons) in Geomatics in LSGI, PolyU, and the first such undergraduate degree program in the world. This relatively new scope extends the land surveying discipline from the scope of positioning, mapping and monitoring from above ground objects to underground objects. At present, the demand is no longer only about safety, but also extends to detail 3D underground/subsurface mapping, monitoring and method validation with precise land and underground surveying technologies, as well as customization of this information into unified database using geographical information system (GIS). This stream strives to provide a total solution that help to solve a range of underground utility problems at different stages and provides training starting from undergraduate level. This stream is defined by six domains:

1. Geo-spatial positioning and mapping
2. Condition survey, monitoring and diagnosis
3. Coordinated and integrated system and design for new construction
4. Trenchless construction
5. Trenchless maintenance, and
6. Construction, operational, business, and data management.