



# JS3130

## **Bachelor of Science (Honours) Scheme in Spatial Data Science and Smart Cities - Land Surveying and Geo-Informatics**

*For Sept 2022 Entry*

空間數據科學及智慧城市(榮譽)理學士組合課程

— 土地測量及地理資訊學

2022年9月入學

Programme offered 提供課程:  
BSc (Hons) in Land Surveying and Geo-Informatics  
土地測量及地理資訊學(榮譽)理學士學位

**The ONLY Land Surveying and Geo-Informatics  
Bachelor's Degree Programme in HK**  
全港唯一土地測量及地理資訊學學士課程



## Introduction 概述

The Department of Land Surveying and Geo-Informatics (LSGI) is one of the world's leading departments in the discipline of Geomatics education and research. With over 35 years of history, we are the ONLY department among local tertiary institutions offering such education, training and research programmes in land surveying, geo-informatics, and utility management and surveying, including HD, BSc, Master and PhD.

The department's teaching and research place an emphasis on the acquisition, modelling, analysis, and management of spatially referenced data with a wide-range of applications. These include urban geo-informatics, smart city, spatial big data analytics, mobile mapping, urban disaster mitigation, positioning and navigation, utility surveys and management, planetary mapping, urban 3D modelling and remote sensing for environmental studies.

The department has a suite of well-equipped laboratories supporting study and research in the areas of cadastre survey, digital cartography, geographic information systems, geomatics computing, hydrographic survey, navigation, photogrammetry, remote sensing, laser scanning, geodesy, engineering survey, deformation and geohazards and underground utility imaging and diagnosis. Students and researchers work with the state-of-the-art facilities and are tutored by world-renowned academic staff members, thus having a variety of opportunities for a future career.

Our programmes are oriented towards the specific needs of Hong Kong, as well as the global job market. Our applied research is focused on the needs of industrial, commercial and community. Our graduates are able to apply the learned theories in practice as our programmes are application-oriented. Besides, through our partnerships and consultancy work with the industry and businesses as well as through our community service work, the department maintains close relationships with the professional world and the community.

土地測量及地理資訊學系 (LSGI) 是全球同類地理資訊學系中最優秀的學系之一，學系在國際著名期刊所發表的論文數量和論文引用率均位列前名。逾三十五年歷史，LSGI 乃本港唯一大專院校提供土地測量、地理資訊科技及管線設施測繪與管理專業的教育、培訓和研究課程 (包括高級文憑、學士、碩士、博士學位課程)。

LSGI 教學與研究的重點是獲取、建模、分析和空間數據以滿足各種不同的應用需求，包括城市地理資訊、智慧城市、空間大數據分析、移動測繪、城市減災、定位和導航、管線設施測繪及管理、行星測繪、城市三維建模以及遙感進行環境研究。

LSGI 設有一系列先進及設備完善的實驗室，以提供在地籍測量、數字化制圖、地理資訊系統、地學計算、水文測量、導航、攝影測量、遙感、激光掃描、大地測量、工程測量、地表變形災害監測、地下管線造型與診斷等領域的教學和研究。學生和研究人員可以使用這些先進的實驗設備以及與國際知名的教授學者交流研討。除了各種研究項目，學生還會有許多參與具體實踐工作的機會。

我們的研究和課程切合香港及世界發展的需要。我們的研究工作具實用性及以應用為主，切合工業、商業和社會的需要。同樣藉着我們應用為中心的課程，LSGI 畢業生均能夠把所學的理论運用在實際項目中。通過與有關工商業夥伴的合作及交流，我們能與各有關行業保持密切連繫。

## Our Programmes 課程簡介



### The Department offers the following programmes:

本學系提供以下課程

- *Bachelor of Science (Hons) in Land Surveying and Geo-Informatics\**  
土地測量及地理資訊學(榮譽)理學士學位\*
- *Higher Diploma in Land Surveying and Geo-Informatics (for entry before 2022)*  
土地測量及地理資訊學高級文憑 (適用於2022年之前入讀)
- *Master of Science / Postgraduate Diploma in Geomatics (GIS or Surveying)*  
測繪及地理資訊學理學碩士學位 / 深造文憑 (測量 或 地理資訊)
- *Master of Science / Postgraduate Diploma in Urban Informatics and Smart Cities*  
城市信息學及智慧城市理學碩士學位 / 深造文憑
- *Doctor of Philosophy / Master of Philosophy*  
哲學博士 / 哲學碩士

\*Admission under the BSc (Hons) Scheme in Spatial Data Science and Smart Cities (JS3130).  
課程收生透過「空間數據科學及智慧城市(榮譽)理學士組合課程」(JS3130)

### Undergraduate Programme 本科課程:

For Entry in Sept 2022

2022年9月入學

Scheme Code 組合編號	JS3130	
Scheme 組合	BSc (Hons) Scheme in Spatial Data Science and Smart Cities	空間數據科學及智慧城市(榮譽) 理學士組合課程
Programme Offered 學位課程	BSc (Hons) in Land Surveying and Geo-Informatics	土地測量及地理資訊學(榮譽) 理學士
Normal Duration 一般修讀年期	4 Years 年	
Mode 修讀模式	Full-time	全日制
Credit Requirements 學分要求	122 Credits 學分	
Fund Type 資助模式	UGC Fund	教資會資助
Medium of Instruction 授課語言	English	英語





# Entrance Requirements 入學資格

## BSc (Hons) Scheme in Spatial Data Science and Smart Cities - Land Surveying and Geo-Informatics

### 空間數據科學及智慧城市(榮譽)理學士組合課程 – 土地測量及地理資訊學 (JS3130)

- For HKDSE applicants: 持有香港中學文憑考試成績的申請人  
University's General Entrance Requirements 理大一般入學要求

HKDSE Subjects 科目	Core Subjects 主要科目				Elective Subjects (including M1/M2) 選修科目(包括M1/M2)	
	Chinese Language 中國語文	English Language 英國語文	Mathematics 數學	Liberal Studies 通識	1st Elective 第一選修科目	2nd Elective 第二選修科目
Level Requirement 考獲級別	3	3	2	2	3	3

There is no compulsory subject requirement in JUPAS admission. Preferred subject(s) with the highest weighting for admission score calculation include(s):

English Language, Mathematics, Mathematics (Extended part - Calculus and Statistics), Mathematics (Extended part - Algebra and Calculus), Physics, Combined Science (with Physics), Integrated Science, Geography, Information and Communication Technology.

大學聯招辦法沒有必修科目。以下學科為計算分數權重最高的科目：

英文、數學、數學（延伸部分 - 微積分及統計學）、數學（延伸部分 - 代數及微積分）、物理、組合科學（包含物理科）、綜合科學、地理、資訊及通訊科技。

Admission Score Calculation Mechanism: **Any Best 5 Subjects**

入學成績計算機制：任何最好的5科成績

For details of non-JUPAS and non-local applications, please refer to the website of LSGI or Study@PolyU.  
有關非大學聯招辦法及海外學生報讀的申請，請查閱大學網站。

## Application Procedures 申請程序

Prospective students can obtain application materials and submit applications via the Study@PolyU website at [www.polyu.edu.hk/study](http://www.polyu.edu.hk/study).

申請者可透過Study@PolyU 網站[www.polyu.edu.hk/study](http://www.polyu.edu.hk/study) 索取申請材料及提交申請。

## Scholarship 獎學金

Partnering with professional bodies and industry (e.g. HSBC, HKIS, HKIE, HKIES, RICS, etc), we offer students more than 10 scholarship schemes, annually over HK\$300,000.

大學、學系與專業團體及業界提供多項獎學金計劃予學生，每年金額逾港幣\$300,000。

JS3 I 30

# BSc (Hons) Scheme in Spatial Data Science and Smart Cities

空間數據科學及智慧城市(榮譽)理學士組合課程



## Award Programme: BSc (Hons) in Land Surveying and Geo-Informatics

學位課程: 土地測量及地理資訊學(榮譽)理學士

### Programme Aim

The programme aims to provide inter-disciplinary education to nurture students to develop essential knowledge in land surveying and geo-informatics under our scheme: spatial data science and smart cities. Our graduates shall meet the changing market conditions in Hong Kong, the Chinese mainland and the Globe, and the demands of the professions in land surveying, geo-information technology, utility management and surveying, and their data analytics and smart city management.

### 課程目的

空間數據科學及智慧城市(榮譽)理學士組合課程-土地測量及地理資訊學提供跨學科教育。我們致力培訓學生掌握土地測量和地理資訊相關的知識和技巧，並有效應用於空間數據科學和智慧城市相關發展。畢業生可適應香港、中國內地和全球瞬息萬變的市場環境和社會需要，在土地測量、地理資訊科技、地下管線測量及管理的領域上，以及其空間數據分析和智慧城市管理等方面，學以致用。

### Programme Characteristics

This programme provides a unique and inter-disciplinary land surveying and geo-informatics (LSGI) education in Hong Kong that meets the societal demands. We nurture students to develop essential knowledge in our scheme: spatial data science and smart cities. The scheme then extends to application areas and job market, such as survey and mapping, engineering surveying and underground utility imaging & diagnosis, transportation and logistics.

Spatial data science, as an essential part of the smart cities, integrates data from all kinds of geo-spatial technologies (GPS, location sensors, data from social media, mobile devices, satellite imagery, etc). The purpose is to build data visualization for understanding related phenomena and studying trends in complex relationships between people and places. It benefits various areas, including transportation, urban planning, information technology, real estate, environment, public health, social welfare and infrastructure monitoring.

The programme is the only local bachelor's degree programme in land surveying and geo-informatics accredited by the Hong Kong Institute of Surveyors, the Royal Institute of Chartered Surveyors (RICS) and other related local/international professional bodies. Over the years, about 40% of our students gain various international learning experience like exchange and internship.

### 課程特色

本課程為全港唯一跨學科的土地測量和地理資訊學學士課程，培訓相關的專才以應對社會的需求。學生於組合課程學習下，學習有關空間數據科學和智慧城市的主题知識。組合課程延伸至不同的應用領域及就業市場，例如測繪、工程測量和地下管線成像與診斷、運輸和物流等。

空間數據科學作為智慧城市的重要基礎知識，結合各種地理空間科技（自動導航系統、位置傳感器、社交媒體數據、移動設備、衛星圖像等）的數據。目的是建構數據可視化，以發掘分析人類與地理位置之間的複雜關係、現象及趨勢。學科知識應用於廣泛的領域，包括交通、城市規劃、資訊科技、房地產、環境、公共衛生和社會福利、基礎設施監測等。

本課程獲得香港測量師學會、英國皇家特許測量師學會、其他相關本地及國際專業團體的專業認可，乃全港唯一獲相關專業資格認證的學士學位課程。每年本系約有四成的學生獲得海外交流或實習等學習機會，開拓國際視野。





# Discipline Introductions

## 1. Land Surveying (LS)

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

- Topographic 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, infrastructure and buildings
- Hydrographic Surveying - water depth and features

## 2. Geo-Information Technology (Geo-IT)

Over the past years, land surveyors have used the Geographic Information System (GIS) for managing and analysing surveying-related spatial data. Recently, the number of GIS users from non-surveying fields has increased markedly in Hong Kong. This is due to the advances in computer technology and the improvements in spatial data handling algorithms and, in particular, to the availability of digital map data in Hong Kong. The new users include professionals from logistics, intelligent transport systems, environmental studies, urban planning and other applications.

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

## 3. Utility Management and Surveying (UMS)

Utility surveying is a fast growing professional field responsible for the design, construction, maintenance and management of utility systems such as water supply systems, power supply systems, gas and fuel systems, electrical and telecommunication systems, and drainage and waste water systems. The programme is designed to cater specifically to the unique requirements of Asia's complex underground utility network.

### 課程學科簡介

#### 1. 土地測量 (LS)

土地測量是測量和收集地理形態數據，包括自然和人造地理形態。基於地理形態會隨著時間而變化的功能、位置、尺寸、土地測量可分為：

- 地形測量 - 自然（山脈、峽谷、河流等）和人造（道路、建築物等）地理形態
- 地籍測量 - 私人或公家土地或物業
- 工程測量 - 與建設道路和建築物有關
- 水文測量 - 水深和特性



Data acquisition by UAV

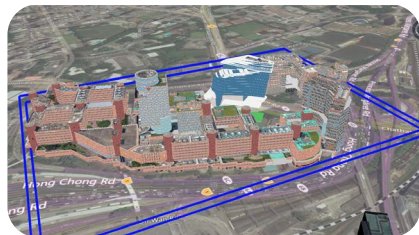




## 2. 地理資訊科技 (Geo-IT)

過去多年，土地測量師使用地理資訊系統(GIS)管理和分析與測量相關的空間數據。近年，隨著計算機技術及空間數據處理法的改進，尤其是數字地圖的推出，香港的非測量領域GIS用戶數量顯著增加。新用戶包括從事物流、智能交通系統、環境研究和城市規劃的專業人士。

地理資訊領域的最新發展包括三維建模和可視化，定位服務的科研和應用（如開發先進的移動導航和資訊服務系統），以及基於互聯網的傳遞空間資訊和服務（如谷歌地圖）等。



3D Model of PolyU

## 3. 管線設施測繪與管理 (UMS)

管線設施測量是一個快速發展的專業領域，包括設計、建造、維修和管理管線系統，如供水系統、供電系統性、天然氣和燃油系統、電氣和電訊系統、排水和污水系統。課程的設計是專門為亞洲城市密集地下管線測繪的獨特需求而設。



Instrumentation in Underground Utility Survey Lab

## Professional Recognition 專業認可



THE HONG KONG INSTITUTE OF

**SURVEYORS**

香港測量師學會

The Hong Kong Institute of Surveyors (HKIS)  
香港測量師學會(HKIS)



**RICS®**

The Royal Institution of Chartered Surveyors (RICS)  
英國皇家特許測量師學會(RICS)



The Chartered Institution of Civil Engineering Surveyors (ICES)  
英國特許土木工程測量師學會(ICES)



The Land Surveyors Board Malaysia (LSB)



The Hong Kong Institution of Engineering Surveyors (HKIES)  
香港工程測量師學會(HKIES)

## BSc (Hons) in Land Surveying and Geo-Informatics

### 土地測量及地理資訊學(榮譽)理學士學位

The programme curriculum enables graduates to develop careers in the one of below professions according to their preference:

- Land Surveyors in the Government (e.g. Lands Department, Highways Department, Planning Department, etc.), statutory organizations, construction and consulting companies, land surveyors' firms, etc., responsible for the measurement of natural land features (mountains, valleys, rivers, etc.) and infrastructure (roads, buildings, etc.) in the disciplines of topographic, cadastral, engineering and hydrographical surveying.
- Geo-IT Managers/Specialists in logistics management, intelligent transport systems, environmental consultancy and urban planning, responsible for 3D modelling and visualisation, applications of location based services (e.g. advanced mobile systems for navigation and service information provision), and Internet spatial information delivery and service (e.g. Google maps).
- Utility Surveyors in private firms involved in surveying planning, construction, maintenance and management of underground facilities and utilities such as power, water, drainage, gas, communications and energy services, responsible for mapping, imaging of positions and conditions, and diagnosis of the unseen and complex underground utilities.

課程設計讓畢業生可自由選擇投身以下三類職業範疇：

- 專業土地測量師  
可投身政府（如地政總署，路政署，規劃署等）、法定組織、建築、顧問公司或土地測量師事務所等。負責測量不同自然（山脈，山谷，河流等）和基礎設施（道路，建築物等）的地理形態，地形測量、地籍測量、工程測量及水文測量。
- 地理資訊科技經理/專家  
可從事物流、智能交通系統、環境研究或城市規劃等專業。負責三維建模和可視化，定位服務的科研和應用（如移動導航和資訊服務系統）以及互聯網空間資訊和服務等（如谷歌地圖）。
- 管線設施測量師  
可投身有關地下設施及公用設施的私人機構，包括電力，水，排水，天然氣，通訊和能源服務等。以協助規劃、建造、維修及管理複雜的地下設施。





## Student Exchange Programme 交換生計劃

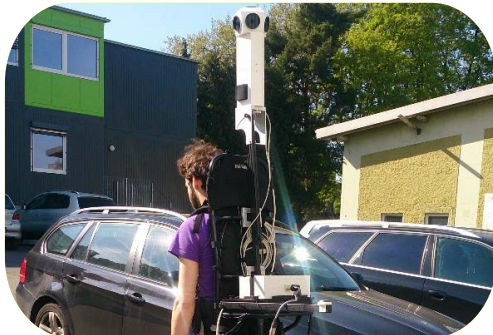
The Student Exchange Programme provides students with opportunities to enhance their practical skills and professional knowledge by studying at our overseas partner universities. The programme also cultivates independence, enhances students' interpersonal and problem-solving skills, and exposes them to a multicultural environment.

透過提供到海外合作大學的學習機會，讓學生提升專業的技能和知識。計劃亦助學生培養獨立性，增強溝通和解決問題的能力，在多元文化的環境下學習。

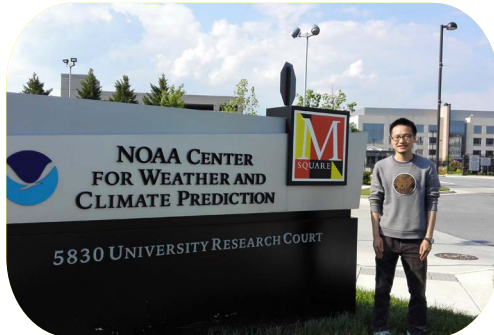
**Australia 澳洲**



**Canada 加拿大**



**Germany 德國**



**USA 美國**

## Visit & Study Tour 交流團

**Korea 韓國**



**Xuzhou 徐州**



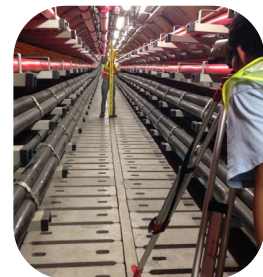
**Italy 意大利**



## Local & Overseas Work Intergrated Education (WIE) 本地及海外企業實習教育

We place great significance on students' practical training and connecting classroom theory with workplace applications. The WIE programme (both local and overseas) enhances the development of all-round students with professional competence, which is important in the face of an ever-changing and increasingly competitive environment.

大學十分重視學生的實習培訓，讓學生能將課程理論運用於實際工作上。本地及海外企業實習教育培育學生的專業技能，以面對迅速變化及競爭激烈的環境。



## Field Scheme/ Survey Camp 測繪實習





## Student Awards 學生獎項



2020 Outstanding Student Awardee

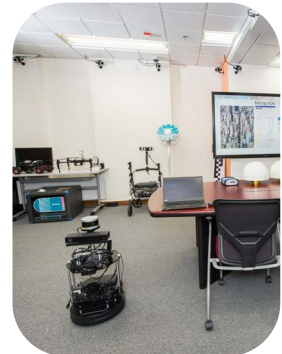


Awardees in Bentley Institute 2021 Student BIM Challenge



Awardees in HKIS Scholarship and Dissertation Awards in 2021

## Laboratories and Facilities 實驗室及教學設施





## Enquiries 查詢

Programme Enquiry  
Dr. Xiaolin ZHU (Programme Leader)  
Tel: 2766 5976  
Email: xiaolin.zhu@polyu.edu.hk  
Dr. Wai Yeung YAN (Deputy Programme Leader)  
Tel: 2766 5977  
Email: waiyeung.yan@polyu.edu.hk

### 課程查詢

朱孝林博士 (課程主任)  
電話: 2766 5976  
電郵: xiaolin.zhu@polyu.edu.hk  
甄威揚博士 (副課程主任)  
電話: 2766 5977  
電郵: waiyeung.yan@polyu.edu.hk

For more admission information, please visit our website  
更多課程入讀要求可參閱網址  
[www.polyu.edu.hk/lsgi/study](http://www.polyu.edu.hk/lsgi/study)

Study@PolyU



### General Enquiry 一般查詢

General Office  
Tel: 2766 5968  
Email: lsdept@polyu.edu.hk  
Website: [www.polyu.edu.hk/lsgi](http://www.polyu.edu.hk/lsgi)

學系辦公室  
電話: 2766 5968  
電郵: lsdept@polyu.edu.hk  
網址: [www.polyu.edu.hk/lsgi](http://www.polyu.edu.hk/lsgi)



LSGI.PolyU



PolyU-LSGI



Opening Minds • Shaping the Future • 啟迪思維 • 成就未來

This booklet was compiled in September 2021 and the latest information should be found at Study@PolyU website.

本課程資料編輯於2021年9月，最新資料可參閱Study@PolyU。