For Year 2 BGF students
(cohort 2009/10)

THE HONG KONG POLYTECHNIC UNIVERSITY

DEPARTMENT OF LAND SURVEYING & GEO-INFORMATICS

BSc (Hons) in Geomatics with Specialism in Land Surveying
測繪及地理資訊學(榮譽)理學士學位－土地測量專業

BSc (Hons) in Geomatics with Specialism in Geo-Information Technology
測繪及地理資訊學(榮譽)理學士學位－地理資訊科技專業

BSc (Hons) in Geomatics with Specialism in Utility Management and Surveying
測繪及地理資訊學(榮譽)理學士學位－管線設施測繪與管理專業

AND

BSc(Hons) in Geomatics, with specialism in Geo-information Technology (Geo-IT) AND BSc (Hons) in Computing

測繪及地理資訊學(榮譽)理學士學位－地理資訊科技專業及
電子計算(榮譽)理學士學位

2010

Course Scheme

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General Information

Institution	:	The Hong Kong Polytechnic University
Faculty	:	Construction and Land Use
Department	:	Department of Land Surveying & Geo-Informatics
Head	:	Professor X L Ding
Programme Code	:	34014
Mode of Attendance	:	Full time
Duration	:	Normally 3 years
Implementation Date	:	September 2005
Quota (Intake)	:	46 students
Programme Leader	:	Dr Conrad Tang

"This Definitive Programme Document is subject to review and changes which the Programme Host Faculty/Department/School can decide to make from time to time. Students will be informed of the changes as and when appropriate."

Contents

1. INTRODUCTION

1.1 Background

Prior to the implementation of the current B.Sc. (Hons) in Surveying and Geo-Informatics programme, Hong Kong did not have its own land surveying degree programme upon which the profession could draw. This degree programme was originally designed to meet Hong Kong's needs for training modern professional land surveyors who require sound theoretical and practical knowledge, as well as management skills in Geomatics. The programme accepted the first batch of students in 1991, accredited by The Royal Institution of Chartered Surveyors (RICS) and The Hong Kong Institute of Surveyors (HKIS) in October 1993, was further accredited by the Institution of Civil Engineering Surveyors (InstCES) for five years with effect from March 2001, and re-validated by HKIS for five years with effect from 2003. Upon re-structuring of the BSc programme in 2006, HKIS further accredited this programme for another five years commencing from the 2005 intake.

With the enactment of the Land Titles Ordinance 2004, landowners are allowed to apply for a determination of boundary with a title survey plan. The law further improves boundary security in Hong Kong and it is expected that there will be a constant increasing requirement for Authorized Land Surveyors. The current B.Sc. (Hons) in Surveying and Geo-Informatics is the only academic programme to fulfill the personnel demand of the professional land surveying market.

Besides the persistent demand for land surveying graduates in the Geomatics market for supporting Hong Kong's infrastructure development and spatial information management, the rapid development of computer technology, GIS and remote sensing software has revolutionized spatial data handling and Geo-IT management. These require high-level training in internet/computer programming, software design, as well as computer aided drafting and visualization. With the release of digital map data from the Land Information Centre, Survey and Mapping Office of the Lands Department, and the formulation of Spatial Data Alignment measures by the Environment, Transport and Works Bureau, Geographic Information Systems (GIS) has now been widely promoted and incorporated in the operations of many Government Departments, e.g. Lands Department, Planning Department, Highways Department, Fire Services Department. Additionally, GIS is beneficial to a wide spectrum of socio-economic and commercial applications such as real-estate, facility management, planning, public administration, transport logistics and archaeology. Furthermore, the report entitled "2001-based Manpower Projection for the Information Domain up to 2007" issued by the economic analysis of the Financial Services and Treasury Bureau in June 2003 estimated a rise in the IT manpower requirement at an average annual growth rate of 6.1% from year 2002 to 2007. It is also expected that future manpower requirements will be for more graduates with higher educational attainments. Currently, except the BSc(Hons) in Surveying and Geo-Informatics programme offered by the PolyU, there is no other undergraduate programmes available in Hong Kong to train Geo-IT personnel to meet the anticipated rise in the demand of Geo-IT manpower.

The community need for Geo-IT manpower is evidenced with the diversified backgrounds of our current students studying the part-time MSc programme in GIS, involving land surveyors, environmental engineers, town planners, computer systems managers, and software specialists. The demand for Geo-IT manpower is also evidenced with the diversity and number of Geo-IT related consultancy projects. In the last few years, LSGI has been requested to conduct a number of consultancy projects related to Geo-IT for government departments such as Geotechnical Engineering Office of CED, Agriculture, Fisheries and Conservation Department, Antiquities and Monuments Office, Lands Department, Planning Department, Transportation Department and Police Department and private companies. In the

last three years, despite the economic downturn, LSGI carried out 15 Geo-IT related consultancy projects.

Globally, Geo-IT is a fast growing industry in many countries such as China and USA. In USA, Geo-IT has become one of the three hottest occupations (with Biotechnology and Nanotechnology, http://www.careervoyages.gov/whatshot.cfm). In the Chinese mainland, over 130 universities have started to run Geo-IT programmes at BSc level to cater for the anticipated manpower demand.

In view of the anticipated rise in the demand for Geo-IT manpower, the University in its Academic Development Proposals for the Triennium 2005-2008 proposed to redevelop the existing BSc(Hons) in Surveying and Geo-informatics to allow students to specialize in either Land Surveying or Geo-information Technology. Moreover, a double degree programme leading to the BSc(Hons) in Geomatics (Geo-IT) and BSc(Hons) in Computing is proposed in order to maximize the synergy of Geo-IT with computer science.

According to the review of the market demand in the Geomatics related disciplines carried out by the Department in the 2007-08 academic year, it was concluded that due to the growing acceptance and awareness of utility survey in the community, utility surveying is currently emerging as a new profession in Hong Kong. The growing demand for this profession is the result of the increasing awareness of tragedies which have been caused by insufficient monitoring and maintenance of underground utilities. One typical example is the disaster landslip which happened in Kwun Lung Lau in the Western area of Hong Kong (known as the Kwun Lung Lau event) on 23 July 1994. Following the Kwun Lung Lau Event, the need for surveys of underground utilities attracted wide attention, and subsequently, standards and regulations were developed to define and regulate utility surveying practices. For example, the Code of Practice (COP) on Inspection & Maintenance of Buried Water Carrying Services Affecting Safety of Slope was enacted in 1996. It was then revised in 2006 by the then ETWB and renamed the Code of Practice on Monitoring and Maintenance of Water Carrying Services Affecting Slopes. The Gas Safety Ordinance regulated by the Electrical and Mechanical Services Department (EMSD) of the HKSAR Government was released and enacted on 1997. The ordinance required utility survey to be performed prior to any digging works. A similar Electricity Supply Lines (Protection) Regulation, Cap406H also regulated by EMSD was enacted on 1 April, 2002 and its COP was revised in late 2004 and came into effect on 1 October, 2005. This regulation requires a competent person (CP) to undertake cable detection to ascertain the existence, alignment and depth of underground electricity cables before excavation. In response to the need of the market, the Hong Kong Institute of Utility Specialists (HKIUS) was formed in 2002 as a professional body to regulate the standard, practices and certification within the industry. At present, Hong Kong is very much in short of properly trained Utility Specialists. It is anticipated that the shortage of qualified utility specialists will become more serious due to persistent growth of the underground utilities projects. One example is the rapid growth of broadband communication services becoming a standard built-in feature of new household and commercial premises. A degree programme to provide formal training of utility surveying, leading to professional recognition in the field is thus essential. At present, no such degree programme is available in Hong Kong.

1.2 Programme Title and Mode of Attendance

BSc (Hons) in Geomatics with Specialism in Land Surveying
測繪及地理資訊學(榮譽)理學士學位－土地測量專業

BSc (Hons) in Geomatics with Specialism in Geo-Information Technology
測繪及地理資訊學(榮譽)理學士學位－地理資訊科技專業

BSc (Hons) in Geomatics with Specialism in Utility Management and Surveying
測繪及地理資訊學(榮譽)理學士學位－管線設施測繪與管理專業

BSc (Hons) in Geomatics with specialism in Geo-information Technology (Geo-IT) AND
BSc (Hons) in Computing
測繪及地理資訊學(榮譽)理學士學位－地理資訊科技專業 及
電子計算(榮譽)理學士學位

Major (Geo-IT) and Minor (Computing)
Double Major route
Degree+Major route

Mode of Attendance : Full-time / SAND

1.3 Duration

BSc (Hons) in Geomatics with Specialism in Land Surveying
測繪及地理資訊學(榮譽)理學士學位－土地測量專業

BSc (Hons) in Geomatics with Specialism in Geo-Information Technology
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3 years (normally 3 years, maximum 6 years) + optional 11-month Sandwich year

BSc(Hons) in Geomatics with specialism in Geo-information Technology (Geo-IT) AND
BSc(Hons) in Computing:

- Major (Geo-IT) and Minor (Computing) : normally 3 years , maximum 6 years
- Double Major route and Degree+Major route : normally 4 years, maximum 8 years

1.4 Total Credits Required for Graduation

BSc (Hons) in Geomatics with Specialism in Land Surveying
BSc (Hons) in Geomatics with Specialism in Geo-Information Technology
FT : 93 credits + 3 training credits
SAND : 93 credits + 22 training credits

BSc (Hons) in Geomatics with Specialism in Utility Management and Surveying
FT : 94 credits + 3 training credits
SAND : 94 credits + 22 training credits

BSc (Hons) in Geomatics with specialism in Geo-information Technology (Geo-IT) AND
BSc (Hons) in Computing:

FT : 143 credits + 3 training credits
SAND : 143 credits + 22 training credits

Major (Geo-IT) and Minor (Computing)

FT : 94 credits + 3 training credits
SAND : 94 credits + 22 training credits

Double Major route

FT : 126 credits + 3 training credits
SAND : 126 credits + 22 training credits

Degree+Major route

FT : 134 credits + 3 training credits
SAND : 134 credits + 22 training credits

1.5 Proposed Start Date

The following programmes were implemented in the 2005/06 academic year:

BSc (Hons) in Geomatics with Specialism in Land Surveying
BSc (Hons) in Geomatics with Specialism in Geo-Information Technology

BSc (Hons) in Geomatics with Specialism in Geo-Information Technology (Geo-IT) AND
BSc (Hons) in Computing

The following programme was implemented in the 2009/10 academic year:

BSc (Hons) in Geomatics with Specialism in Utility Management and Surveying

2. PHILOSOPHY, OBJECTIVES AND OUTCOMES OF THE PROGRAMME

2.1 Programme Philosophy

Our programme philosophy is to prepare the graduate capable to cope with the requirement of rapidly changing market demands in Hong Kong, Chinese mainland and the region, and to competently assume the responsibilities of his/her future professions in Land Surveying, Geo-Information Technology, and Utility Management and Surveying. Department has close link with professional bodies and has invited experts of the industry to give lectures to students.

BSc (Hons) in Geomatics with Specialism in Land Surveying

To provide education to meet the modern land surveyor manpower requirement of Hong Kong professional community. The existing programme is accredited by the Hong Kong Institute of Surveyors (HKIS), The Royal Institution of Chartered Surveyors (RICS), and the Institution of Civil Engineering Surveyors (Inst. CES).

BSc (Hons) in Geomatics with Specialism in Geo-Information Technology

To provide education for graduates to work competently as Geo-IT professional with managerial responsibilities of system design, analysis and management of geographic information particularly in transport & logistics, environmental, commercial, and construction applications.

This programme is accredited by the Hong Kong Institute of Surveyors (HKIS), The Royal Institution of Chartered Surveyors (RICS), and the Institution of Civil Engineering Surveyors (Inst. CES), and the Geo-IT Specialism is seeking accreditation from the Information Engineering Discipline of HKIE.

BSc (Hons) in Geomatics with Specialism in Utility Management and Surveying

To provide education to meet the modern utility surveying manpower requirement of Hong Kong and Chinese mainland's professional community. The initial aim of this programme is to seek accreditation from the Hong Kong Institute of Utility Specialists (HKIUS) and The Hong Kong Institute of Surveyors (HKIS).

BSc(Hons) in Geomatics with specialism in Geo-information Technology (Geo-IT) AND BSc(Hons) in Computing

Over the past years, land surveyors used GIS for managing and analyzing surveying-related spatial data. In recent years, the number of GIS users from non-surveying field have increased markedly in Hong Kong as a result of advances in computer technology and improvement in spatial data handling algorithms, and in particular the availability of GIS data in Hong Kong. The new users include professional from logistics, intelligent transport systems, environmental studies and urban planning.

Like other countries, Geo-IT has now evolved into a specialized IT discipline in Hong Kong that requires particular education for graduates to carry out complex GIS tasks in terms of system design and spatial data management. In view of this demand, the Double Degree programme with Major (Geo-IT) and Minor (Computing) exit point is jointly offered by LSGI and COMP to meet the following objectives:

Major(Geo-IT) and Minor(Computing), Double Major and Degree+Major

To provide education for graduates to be able to carry out and manage technical details of GIS projects, with particular emphasis on software customization and development.

Double Degree

To provide education for graduates competent in both Geo-IT and Computer Science adaptable to the changing market demands on Geo-IT and general IT in Hong Kong, Chinese mainland and the region.

This double degree programme is intended to seek accreditation from the Information Engineering discipline of HKIE.

2.2 Work-Integrated Education (WIE)

All Students are required to fulfill the following 3-credit WIE requirements:
(1) minimum one-month summer training,
(2) one-week industrial safety training

Students who have successfully completed the optional 11-month sandwich placement will be exempted from the requirement (1).

The sandwich placement arrangement is as follow:

Land Surveying Specialism
After completing stage 2, students may progress to stage 3, or commit to a 11-month sandwich placement before proceeding to stage 3. Places for the sandwich programme will vary between zero and x, where x is the number of 11-month professional placements secured with the industry.

Geo-IT Specialism and the Double Degree Route
Students following these routes may, after completing stage 2, progress to stage 3, or commit to a 11-month sandwich placement before proceeding to stage 3. Places for the sandwich placement will vary between zero and y, where y is the number of 11-month professional placements secured with the industry.

Utility Management and Surveying Specialism
After completing stage 2, students may progress to stage 3, or commit to a 11-month sandwich placement before proceeding to stage 3. Places for the sandwich programme will vary between zero and x, where x is the number of 11-month professional placements secured with the industry.

2.2.1 Strategies for Supporting Learning in the Workplace

Learning in the workplace needs great support from the industry. LSGI will maintain close links with Lands Department of SAR Government and industry through different functions and services such as dinner talks, seminars, and active participation in professional institutions. The Survey and Mapping Office (SMO) of Lands Department has been the major supporter of the Work Integrated Education (WIE) of the current programme. It is expected that SMO will continue provide strong support on summer training in the years to come.

Intended Learning Outcomes

After participating the WIE component, students are expected to have developed

- cooperative attitudes and behavior when working with others
- confidence and ability in carrying out assigned duties
- critical thinking skill in solving real problems
- effective communication skills

2.2.2 Assessment of the WIE Component(s)

Intended learning outcomes will be worked out between the WIE coordinator and employers, and the expectations after the training period conveyed to students. Students are required to submit a reflective journal on what has been carried out and knowledge learned during the training period. An interview will be conducted involving WIE supervisor(s) and company representatives. For the safety training, students have to pass an examination in order to obtain the Green Card.

3. MODE OF STUDY

Table 1 shows the study routes and progression pattern of the re-structured programme which is operated under the credit-based system. Before year 2, students will opt for Land Surveying, Geo-Information Technology (Geo-IT), Utility Management and Surveying, or the Double Degree (DD) route. All specialisms will be run in full-time mode. Year-4 of the double degree route will be self-financed.

	BSc(Hons) in Geomatics (Land Surveying)	**BSc(Hons) in Geomatics (Geo-IT)**	**BSc (Hons) in Geomatics (Utility Management and Surveying)**	**BSc (Hons) in Geomatics (Geo-IT) & BSc (Hons) in Computing**	
YEAR 4				(self-financed) Sem1: 20 credits *(DD)* 17 credits *(DM)* 14 credits *(D+M)* Sem2: 18 credits *(DD)* 15 credits *(DM)* 15 credits *(D+M)*	
YEAR 3	(LS Specialism) Sem1: 13 credits Sem2: 14 credits	(Geo-IT Specialism) Sem1: 15 credits Sem2: 12 credits	(US Specialism) Sem1: 12 credits Sem2: 19 credits	Sem1: 19 credits *(DD)* 16 credits *(MM)* 16 credits *(DM)* 19 credits *(D+M)* Sem2: 17 credits *(DD)* 17 credits *(MM)* 17 credits *(DM)* 17 credits *(D+M)*	Major (Geo-IT)/ Minor (Comp) Exit Point
	3-credit compulsory Work Integrated Education (WIE) (22-credit optional 11-month sandwich programme)				
YEAR 2	(LS Specialism) Sem1: 17 credits Sem2: 16 credits	(Geo-IT Specialism) Sem1: 15 credits Sem2: 18 credits	(US Specialism) Sem1: 12 credits Sem2: 19 credits Summer: 1 credit	Sem1: 18 credits *(DD)* 15 credits *(MM)* 15 credits *(DM)* 18 credits *(D+M)* Sem2: 17 credits *(DD)* 15 credits *(MM)* 15 credits *(DM)* 17 credits *(D+M)*	
YEAR 1 Summer	Field Scheme (3 credits)			Field Scheme : 3 credits *(DD)* 0 credits *(MM)* 0 credits *(DM)* 3 credits *(D+M)*	
Year 1	Common year 1 Sem1:15 credits				
	Sem2: 15 credits			Sem2: 16 credits *(DD)* 16 credits *(MM)* 16 credits *(DM)* 16 credits *(D+M)*	

Table 1: Programme Structure

(DD) - Double Degree route

(MM) - Major (Geo-IT) /Minor (Comp) route

(DM) - Double Major route

(D+M) - Degree+Major route

4. ENTRANCE REQUIREMENTS

4.1 JUPAS Applicants

In addition to the general entrance requirements of the University, the applicant should meet the following specified entrance requirements:

HKALE or HKALE (AS-Level) Grade E or above in one of the following subject: Pure Mathematics, Applied Mathematics, Mathematics & Statistics, Computer Studies, Computer Applications, Geography and Physics (or Engineering Science).

Attainments in other local public examinations and GCE/GCSE/IGCSE examinations as alternatives to HKCEE and HKALE for the purpose of meeting entrance requirements are accepted and shown in Appendix I and II of the *Academic Regulations and Procedures for Credit-based Programmes*.

Remark:

Students opt for the Double Degree of BSc(Hons) in Geomatics (Geo-information Technology) and BSc (Hons) in Computing should obtain Grade C or above in HKCEE Mathematics or Additional Mathematics.

4.2 Alternative Entry Route

(i) A Higher Diploma in Geomatics or the equivalent
OR

(ii) A Diploma (with Credit) in Civil Engineering Studies, Building Studies, Electrical Engineering, Mechanical Engineering or Electronic & Communications Engineering.
OR

(iii) An International Baccalaureate (IB) Diploma

Other qualifications deemed equivalent to the specified entrance requirements will be considered on their individual merits.

4.3 Mature Candidate Entry

Applications may be considered from people who:

(i) have had considerable working experience at the appropriate level in Geomatics or Geo-Information technology.,

(ii) are over the age of 25, and

(iii) can show that they possess the necessary background in mathematics, physics and the English language to be able to undertake the programme.

4.4 Visiting Students

Visiting students may be admitted to the programme on a subject basis not leading to academic award.

4.5 Mainland Student Applicants

Mainland students entering the degree program 34014 FDG through the Non-JUPAS channel are required to take the 34014 FDG Foundation Year program with at least 32 credits before progressing to the degree programs. The Foundation Year program of 34014 FDG has the following curriculum:

Manditory subjects

Code	Subject Title	Credits		Offer Semester
AMA103	Foundation Mathematics I for Science and Engineering	P	3	1
AP101	College Physics I	P	3	1
APSS184	Understanding the Hong Kong Community	M	3	1
COMP100	Introduction to Information Technology	P	3	1
CLU101	Foundation Year Seminar I	M	1	1
ELC1004	English for University Studies I	M	3	1
AMA104	Foundation Mathematics II for Science and Engineering	P	3	2
AMA105	Logic : Qualitative and Quantitative	M	3	2
CLU102	Foundation Year Seminar II	M	1	2
ELC1003	Extended Writing Skills	P	3	2
ELC1005	English for University Studies II	M	3	2
GEC232	Induction to Chinese Civilization	P	3	2

M: University Mandatory subjects
P : LSGI preferred subjects; students are not allowed to change to other elective subjects unless an approval is sought from the course leader.

Progression
To qualify for progression to various schemes of degree programs in LSGI, students need to have a first year GPA of 2.0 or above. The first year GPA is not counted in the Weighted GPA.

5. PROGRAMME STRUCTURE

5.1 To gain the award of BSc(Hons) in Geomatics, or Major(Geo-IT) and Minor(Comp) students must accumulate 94 credits over a period not exceeding 6 years of study, and 3 training credits on "summer training".

5.2 To gain the award of BSc(Hons) in Geomatics (Geo-IT) & BSc(Hons) in Computing, students must accumulate 143 credits over a period not exceeding 8 years of study, and 3 training credits on "summer training".

5.3 One credit is based on 1 hour of contact in a lecture or tutorial situation over an academic semester of 14 weeks. Students are expected to contribute 35-45 hours (including the contact hour) of effort to earn one credit.

5.4 Under the credit-based operation of programmes, this University requires that various subjects be taken by all UGC-funded full-time undergraduate students. These subjects are:

- Profession-specific language subjects : - 6 credits (ELC2401 University English for FCLU Students and ELC3403 Workplace English for FCLU Students)
- GECXXX General Education - 4 credits (2 subjects: China studies, broadening)

5.5 The standard programme structure is given in the Tables 2 a, b & c. Students are strongly advised to follow this pattern of study to ensure smooth progression through the programme.

5.6 The proposed programme has Level 2, 3 and 4 subjects. Each subject carries a weight proportional to its level. Level 2 subjects a weight of 0.2, Level 3 subjects a weight of 0.3, and Level 4 subjects a weight of 0.4.

5.7 The structure of subjects, their pre-requisites, and assessment components are given in Tables 3 a, b & c.

5.8 **Language Proficiency Assessment**

Students are required to sit for the Graduating Students' Language Proficiency Assessment (GSLPA) in both Chinese and English before graduation. Except for those who are given exemption from attempting the GSLPA. Students who have not taken both of the GSLPAs shall not be eligible for graduation.

5.9 **Co-curricular Activities**

The purpose of co-curricular activities is to enhance the students' attribute of all-roundedness. All students admitted on and after 2005/06 are required to participate in at least one non-credit bearing co-curricular activity during their study period, which is a mandatory requirement of general education for graduation. Starting from the 2008/09 entry cohort of full-time undergraduate degree students, a minimum of 6 hours' participation in co-curricular activities is required.

Students who have fulfilled the CCA graduation requirement will have such attainment recorded in the Co-curricular Achievement Transcript (CAT) administered by SAO. Student may preview their CAT online to check their fulfilment status at http://www.polyu.edu.hk/sams/ (view the CAT category titled "Mandatory Requirement").

Further information is available at http://www.polyu.edu.hk/sao/cca/.

Table 2a - Standard Programme Structure (Geo-IT Specialism)
BSc (Hons) in Geomatics with Specialism in Land Surveying, Geo-Information Technology and Utility Management and Surveying (34014) in Credit-based Structure

Year	Credit-Based Programme						Teaching Modes		Assessments	
	Subject	Code	Dept	Credits	Contact Hours	Weight	L/T/S	PW	Exam.	CW
1	Surveying	LSGI2372	LSGI	3	42	0.2	21	42		100%
	Mapping	LSGI228	LSGI	3	42	0.2	28	28	50%	50%
	Principles of Programming	COMP201	COMP	3	49	0.2	42	14	40%	60%
	Mathematics	AMA284	AMA	3	42	0.2	42		60%	40%
	University English for FCLU Students	ELC2401	ELC	3	42	0.2	42			100%
	CAD and Processing for Geomatics	LSGI2294	LSGI	3	42	0.2	14	56		100%
	Survey Adjustment	LSGI2341	LSGI	3	42	0.2	42		50%	50%
	Fundamentals of GIS	LSGI2222	LSGI	3	42	0.2	28	28		100%
	General Education	GECXXX	GEC	2	28	0.2	42			
	General Education	GECXXX	GEC	2	28	0.2	28			
	Introduction to Utility Surveying and Management	LSGI2351	LSGI	2	28	0.2	28			100%
	Field Scheme I	LSGI2361	LSGI	3	42	0.2		84		100%
	Sum of Year 1			33	483					
2	Cartography	LSGI326	LSGI	3	42	0.3	28	21		100%
	Digital Terrain Modelling and Visualisation	LSGI3242	LSGI	3	42	0.3	28	28		100%
	Geomatics Programming	LSGI3291	LSGI	3	42	0.3	21	42	40%	60%
	Remote Sensing	LSGI3321	LSGI	3	42	0.3	28	28	50%	50%
	Communication and Positioning	LSGI3343	LSGI	3	42	0.3	21	42		100%
	Workplace English for FCLU Students	ELC3403	ELC	3	42	0.3	42			100%
	Photogrammetry I	LSGI3332	LSGI	2	28	0.3	21	14	50%	50%
	Geospatial Database and Data Infrastructure	LSGI3243	LSGI	3	42	0.3	28	28		100%
	Spatial Analysis	LSGI3244	LSGI	3	42	0.3	28	28		100%
	Data Integration and System Customisation	LSGI3431	LSGI	2	28	0.3	14	28		100%
	GIS Project	LSGI3251	LSGI	2	28	0.3		56		100%
	Data Structures and Algorithms	COMP305	COMP	3	45.5	0.3	35	21	40%	60%
	Industrial Safety for Surveying and Geo-Informatics	IC251	IC	(1)	15		15			
	Sum of Year 2			33+(1)	480.5					
3	Internet and Mobile GIS	LSGI4292	LSGI	3	42	0.4	21	42		100%
	Geospatial Data Mining & Knowledge Discovery	LSGI4344	LSGI	3	42	0.4	42			100%
	Computing Professionals in Society	COMP452	COMP	3	42	0.4	42			100%
Any one	GIS-based Demographic Analysis	LSGI4261	LSGI	3	42	0.4	28	28		100%
	Geoinformation for Urban and Regional Studies	LSGI4321	LSGI	3	42	0.4	28	28	40%	60%
	Individual Project	LSGI4391	LSGI	6	84	0.4		168		100%
	Geomatics Business Management	LSGI4212	LSGI	3	42	0.4	28	28	50%	50%
Any one	Geo_IT in Cadastre and Land Management	LSGI4302	LSGI	3	42	0.4	28	28		100%
	Geo-IT in Environmental Management	LSGI4322	LSGI	3	42	0.4	28	28	40%	60%
Any one	GIS in Business and E-commerce	LSGI4213	LSGI	3	42	0.4	28	28		100%
	Geo-IT in Logistics & Transportation	LSGI4371	LSGI	3	42	0.4	28	28		100%
	Sum of Year 3			27	378					

Remarks: 14 hours of L/T/S equals 1 credit
2 hours PW equals 1 hour L/T/S

( ) training credit

Table 3a Subject Organisation (Geo-IT Specialism)

Year 1	Dept	Credits	Pre-requisite	Status
semester 1		15		
Surveying	LSGI	3	Nil	Compulsory
Mapping	LSGI	3	Nil	Compulsory
Principles of Programming	COMP	3	Nil	Compulsory
Mathematics	LSGI	3	Nil	Compulsory
University English for FCLU Students	ELC	3	Nil	Compulsory
semester 2		15		
General Education	GEC	2	Nil	Compulsory
General Education	GEC	2	Nil	Compulsory
CAD and Processing for Geomatics	LSGI	3	Nil	Compulsory
Survey Adjustment	LSGI	3	Mathematics	Compulsory
Introduction to Utility Surveying and Management	LSGI	2	Nil	Compulsory
Fundamentals of GIS	LSGI	3	Nil	Compulsory
semester 3		3		
Field Scheme I	LSGI	3	Nil	Compulsory

Year 2	Dept	Credits	Pre-requisite	Status
semester 1		15		
Cartography	LSGI	3	Mapping	Compulsory
Digital Terrain Modelling and Visualisation	LSGI	3	Nil	Compulsory
Geomatics Programming	LSGI	3	Nil	Compulsory
Remote Sensing	LSGI	3	Nil	Compulsory
Communication and Positioning	LSGI	3	Nil	Compulsory
semester 2		18+(1)		
Data Structures and Algorithms	COMP	3	Principles of Programming	Compulsory
Workplace English for FCLU Students	ELC	3	Nil	Compulsory
Photogrammetry I	LSGI	2	Survey Adjustment	Compulsory
Geospatial Database and Data Infrastructure	LSGI	3	Fundamentals of GIS	Compulsory
Spatial Analysis	LSGI	3	Fundamentals of GIS	Compulsory
Data Integration and System Customisation	LSGI	2	Fundamental of GIS	Compulsory
GIS Project	LSGI	2	Fundamentals of GIS	Compulsory
Industrial Safety for Surveying and Geo-Informatics	IC	(1)	Nil	Compulsory

Year 3	Dept	Credits	Pre-requisite	Status
semester 1		15		
Individual Project	LSGI	3	All year 1 subjects	Compulsory
Geospatial Data Mining & Knowledge Discovery	LSGI	3	Nil	Compulsory
Computing Professionals in Society	COMP	3	Nil	Compulsory
Internet and Mobile GIS	LSGI	3	Fundamentals of GIS, Cartography	Compulsory
GIS-based Demographics Analysis (Any one)	LSGI	3	Ditto	Elective
Geoinformation for Urban and Regional Studies (Any one)	LSGI	3	Ditto	Elective
semester 2		12		
Geomatics Business Management	LSGI	3	Nil	Compulsory
Individual Project	LSGI	3	All year 1 subjects	Compulsory
Geo_IT in Cadastre and Land Management (Any one)	LSGI	3	Fundamentals of GIS, Cartography	Elective
Geo-IT in Environmental Management (Any one)	LSGI	3	Ditto	Elective
GIS in Business and E-commerce (Any one)	LSGI	3	Ditto	Elective
Geo-IT in Logistics & Transportation (Any one)	LSGI	3	Ditto	Elective

List of COMP Elective Subjects:

Level	Subject
Level 3 Broadening	
	303 Human Factors and User Interfaces
	309 System Programming
	316 Object Oriented Methods for Information Systems Development
	318 Systems Simulation
	319 Introduction to Multimedia Computing
	321 Introduction to E-business
	323 Introduction to Chinese Computing
	324 Project Methodology and Implementation
	325 Information System Management
Level 4 Specialization	
	406 Artificial Intelligence
	407 Computer Graphics
	408 Parallel and Distributed Computing
	416 Internet working Protocols and Software
	418 Electronic Commerce
	422 Multimedia Systems and Applications
	431 Business Project and Workflow Management
	432 Logistics Management
	433 Information Retrieval
	434 Computational Models
	435 Biometrics and Security
	436 Middleware and Distributed Objects
	437 Mobile Computing
	439 Game Programming
	440 Customer Relationship Management
	441 Software Testing and Quality Assurance
	442 Decision Support Systems
	443 Knowledge and Information Management and Security
	444 Internet Infrastructure Security
	445 Software Process and Project Management
	446 Computational Finance
	447 Scientific Computing
	448 Virtual Reality and Applications

6. PROGRESSION, GRADING AND ELIGIBILITY FOR AWARD

6.1 Progression

A student will have 'progressing' status unless he falls within the following categories, either of which may be regarded as grounds for deregistration from the programme:

(i) the student has exceeded the maximum period of registration for that programme as specified in the definitive programme document; or

(ii) the student's GPA is lower than 2.0 for two consecutive semesters and his Semester GPA in the second semester is also lower than 2.0; or

(iii) the student's GPA is lower than 2.0 for three consecutive semesters.

6.2 Grading

6.2.1 Assessment grades shall be awarded on a criterion-referenced basis. A student's overall performance in a subject shall be graded as follows:

Subject grade	***Short description***	***Revised elaboration on subject grading description***
A+	Exceptionally Outstanding	The student's work is exceptionally outstanding. It exceeds the intended subject learning outcomes in all regards.
A	Outstanding	The student's work is outstanding. It exceeds the intended subject learning outcomes in nearly all regards.
B+	Very Good	The student's work is very good. It exceeds the intended subject learning outcomes in most regards.
B	Good	The student's work is good. It exceeds the intended subject learning outcomes in some regards.
C+	Wholly Satisfactory	The student's work is wholly satisfactory. It fully meets the intended subject learning outcomes.
C	Satisfactory	The student's work is satisfactory. It largely meets the intended subject learning outcomes.
D+	Barely Satisfactory	The student's work is barely satisfactory. It marginally meets the intended subject learning outcomes.
D	Barely Adequate	The student's work is barely adequate. It meets the intended subject learning outcomes only in some regards.
F	Inadequate	The student's work is inadequate. It fails to meet many of the intended subject learning outcomes.

'F' is a subject failure grade, whilst all others ('D' to 'A+') are subject passing grades. No credit will be earned if a subject is failed.

6.2.2 A numeral grade point is assigned to each subject grade, as follows:

Grade	*Grade Point*
A+	4.5
A	4
B+	3.5
B	3
C+	2.5
C	2
D+	1.5
D	1
F	0

6.2.3 At the end of each semester/term, a Grade Point Average (GPA) will be computed as follows, and based on the grade point of all the subjects:

$$\text{GPA} = \frac{\sum_{n} \text{Subject Grade Point} \times \text{Subject Credit Value}}{\sum_{n} \text{Subject Credit Value}}$$

where n = number of all subjects (inclusive of failed subjects) taken by the student up to and including the latest semester/term, but for subjects which have been retaken, only the grade obtained in the final attempt will be included in the GPA calculation

In addition, the following subjects will be excluded from the GPA calculation:

(i) Exempted subjects
(ii) Ungraded subjects
(iii) Incomplete subjects
(iv) Subjects for which credit transfer has been approved without any grade assigned
(v) Subjects from which a student has been allowed to withdraw (i.e. those with the grade 'W')

Subject which has been given an "S" subject code, i.e. absent from examination, will be included in the GPA calculation and will be counted as "zero" grade point. GPA is thus the unweighted cumulative average calculated for a student, for all relevant subjects taken from the start of the programme to a particular point of time. GPA is an indicator of overall performance and is capped at 4.0.

6.3 Eligibility for award

6.3.1 A student would be eligible for award if he satisfies all the conditions listed below:

(i) Accumulation of the requisite number of credits for the particular award, as defined in the definitive programme document; and

(ii) Satisfying the residential requirement for at least 1/3 of the credits to be completed for the award he is currently enrolled, unless the professional bodies stipulate otherwise; and

(iii) Satisfying all the 'compulsory' and 'elective' requirements as defined in the definitive programme document; and

(iv) Having a Grade Point Average (GPA) of 2.0 or above at the end of the programme.

(v) Satisfying other requirements as stipulated in the definitive programme document e.g. Work-integrated experience, co-curricular activities, GSLPA and other language requirements.

6.3.2 A student is required to graduate as soon as he satisfies all the conditions for award (see Section 6.3.1 above). Subject to the maximum study load of 21 credits per semester, a student may take more credits than he needs to graduate on top of the prescribed credit requirements for his award in or before the semester within which he becomes eligible for award.

6.3.3 Double degree programmes

Students graduating with double Majors, a single-discipline degree and a Major, or two full degrees (the 3 possible pathways under the Double Degree programmes model), will receive two award parchments which will be issued upon completion of the second degree. Students following the two full degrees pathway should claim for the degree completed if they decide not to continue with the second degree.

PROGRAMME ORGANIZATION

7.1 Programme Management Structure

Performance of the programme will be reported in the requisite Annual Course Report (ACR), which will be vetted by the DLTC Chairman. The teaching and learning quality assurance will follow the Departmental Teaching and Learning Quality Assurance System.

The running of the programme will be in the hand of the Programme Committee. The Programme Committee will meet at least once in each semester to review the operation and to discuss matters relevant to the operation of the programme. The meetings will also enable the Committee to consider views from the Student/Staff Liaison Committee and from Subject Leaders.

The Programme Committee will exercise the overall academic and operational responsibility for the programme and its development within defined policies, procedures and regulations.

It will be specifically responsible for the following:

(i) The effective conduct, organization and development of the programme, including:

- ensuring the appointment of subject leaders in consultation with the Head of LSGI;
- ensuring that the programme is staffed and resourced to agreed levels through recommendations to, and negotiations with, Heads of contributing departments;
- ensuring that the mechanics of operation, including programme/year/subject time-tabling, teaching rooms, access to specialist facilities, etc, are organized and effective;
- the co-ordination of teaching and other inputs;
- the nomination of a proposed academic advisor and external examiner(s) as required by the programme, for the approval of the Faculty, and
- the implementation of policies for monitoring student progress, student counselling, placements, etc.

(ii) Stimulation of the development of teaching and learning methods and programme material, through Heads of departments, subject leaders, Departmental Learning and Teaching Development Committee, and the Educational Development Centre, as appropriate.

(iii) Review of academic regulations, admissions policy and assessment/ examination methods.

(iv) Formal submissions to appropriate professional bodies, normally via the Head of LSGI and in accordance with the University's established procedures.

(v) Responses to external validating bodies via the University's established procedures.

(vi) The continuing critical review of the aims, objectives and development of the programme.

(vii) The definition and maintenance of the academic standard of the programme.

(viii) Ensuring that the views of students on the programme are known and taken into account.

(ix) The evaluation of the operation, health and progress of the programme.

Undergraduate Programme Committee for the BSc (Hons) in Geomatics with Specialisms in Land Surveying, Geo-Information Technology and Utility Management and Surveying:

Chairman	:	Associate Head
Ex-officio Member	:	Head of LSGI
Members	:	DLTC Chairman Programme Leaders Deputy Programme Leaders Departmental Promotion Officer
Secretary	:	Executive Officer of LSGI

Programme Committee for the BSc(Hons) in Geomatics with specialism in Geo-information Technology (Geo-IT) AND BSc(Hons) in Computing:

Chairmen	:	Programme Leaders (LSGI and COMP)
Members	:	Head of LSGI and COMP Subject Leaders Representative of each contributing department nominated by its Head where the Subject Leader is not from that department Student representatives from each academic year
Secretary	:	Executive Officer of LSGI/COMP

The Programme Committee can also co-opt any individual involved in the teaching of the programme, any Departmental officer or representative from University support units for a particular meeting.

Programme Executive Group

A small Programme Executive Group will manage the day-to-day operation of the programme. The group will operate informally, being organized by the Programme Leader and, in addition to the Head, will typically include Subject Leaders.

Programme Leader

The Programme Leader is an academic staff having a teaching role in at least one year of the programme, appointed by the Head to be responsible for the day-to-day operation on the programme. The Programme Leader will provide the academic and organizational leadership for the programme through the Programme Committee and the Programme Executive Group. In particular, the Programme Leader's responsibilities are:

(i) to co-ordinate the variety of disciplines and service lecturers involved with a level of subjects,

(ii) to monitor student workload in respect of the design programme and the laboratory programme.

(iii) to co-ordinate the preparation of examination papers, the collection of examination results and coursework marks, and their presentation to the Board of Examiners.

(iv) to ensure the effective conduct and organization of the programme within agreed policies and regulations;

(v) to negotiate with the Head the allocation of appropriate staff for teaching and other duties required by the programme;

(vi) to develop good working relationships with the Heads and relevant senior staff of departments involved in the programme and with staff teaching on the programme;

(vii) to keep in close touch with the academic welfare and progress of students on the programme, and to be closely aware of students' views about the programme;

(viii) to report to the Heads of departments concerned on the on-going requirements of staff and resources for the programme, as part of the preparation of departmental estimates;

(ix) to co-ordinate any necessary interaction with professional and external validating bodies through the appropriate internal mechanisms;

(x) to lead the on-going academic review and development of the programme;

(xi) to co-ordinate the inputs to, and the debate of, the Programme Committee leading to the annual course reports and the periodic programme reviews and revalidations; and

(xii) to take executive action as agreed by the Programme Committee.

Subject Leader

The Subject Leader has the additional responsibilities:

(i) to be aware of the students whose progress in either attendance or coursework is not satisfactory and bring this to the attention of the Programme Leader,

(ii) to assist with advice regarding academic and personal problems of students throughout their study period.

7.2 Advisory Committee for LSGI

LSGI has an Advisory Committee which acts as an interface with the land surveying, Geo-IT and the utility industry and the community at large. The Committee normally meets twice per year to review the functioning of the Department (its resources, staffing, research and programmes) and to assist in the planning of new programmes. An annual report on the operation of the degree programme will be submitted to the Committee by the programme leader for review and feedback from the community.

7.3 Student/Staff Consultation

A Student Representative for each year of the programme is elected annually by the students of that year at the beginning of the first academic term.

A Student/Staff Consultative Group, made up of student representatives, subject leaders, the programme leader and the Head meets at least twice a year to provide a formal channel through which students views can be obtained. The Group seeks to ensure that there is adequate and effective opportunities for discussion of the programme between students and staff, for example on such matters as resources, student workload, teaching methods and the relevance of the programme content.

The meetings of the group will not be the only or main channel for dealing with student problems since such matters should be dealt with when they occur by appropriate staff. It is intended that meetings of the group be used for constructive discussion of the programme in general, of the demands of the programme on students, and of possible improvements.

7.4 Subject Leaders & Examiners/Assessors

The delivery of each unit within the curriculum will be the responsibility of the Subject Leader who will either teach the entire unit or co-ordinate the syndicated activity of the teaching staff as appropriate. The Subject Leader will also be the Examiner/Assessor for that unit and will write the examination paper or co-ordinate its compilation. The Subject Leaders should ensure that units are taught as specified in the syllabus and liase with the Programme Leader on any required changes.

7.5 Internal Moderation Panel

An Internal Moderation Panel will be set up by the Programme Leader for the purpose of moderating examination papers and for reviewing the continuous assessment process for each year of the programme. The membership of the Panel will normally comprise members of the Executive Group and all subject Examiners/Assessors not represented in the Executive Group.

The continuous assessment process for the relevant subjects will normally be reviewed at the beginning of each academic year in the light of the previous years' experience.

Subject Examiners will normally submit draft examination papers for internal moderation. The Programme Leader will moderate these papers with a view to highlighting and discussing any potential problems with the Subject Examiner before the Moderation Panel meets to adjudicate all the papers. In the event of any problems, all contributing lecturers for a subject will be invited to attend the Panel meeting.

All papers are subject to external moderation by the External Examiner(s). The External Examiner(s) will also review the records of the continuous assessment process at the end of each academic year.

7.6 Academic Advisor/External Examiner

The academic advisor/external examiner can provide expertise and comparison of standards across the spectrum of the degree programme at an international level.

7.7 Examinations Officer (LSGI)

The Examinations Officer for the LSGI is responsible for all administrative matters concerning the scheduling and conduct of examinations. For the degree programme the Examinations Officer is also be responsible for ensuring the security of examination papers.

7.8 Subject Assessment Review Panels and Board of Examiners

Composition and responsibility of the Subject Assessment Panels and Board of Examiners are based on section B4 of *Academic Regulations and Procedures for Credit-based Programme*.

7.9 Enrolment Liaison Officer (LSGI)

A member of LSGI staff is appointed as Enrolment Liaison Officer for the Department. The duties of the Enrolment Liaison Officer in respect of the degree programme will be to:

(i) examine all applications for entry to the programme;

(ii) attend to any matter of correspondence in connection with such applications;

(iii) arrange for applicants to be invited for interview and allocate provisional and/or definite places to suitable students;

(iv) bring to the attention of the Programme Leader any application presenting difficulty or unusual circumstances;

(v) maintain records and statistics of the number of applications for the programme, the resulting offers and acceptances;

(vi) advise the Programme Leader of any revisions to the University rules and regulations relating to academic standards of entry.

7.10 A diagrammatic summary of the programme management structure is given in Figure 7.1. It should be noted that LSGI staff members may hold several positions concurrently (e.g. the Programme Leader may also be a Subject Leader).

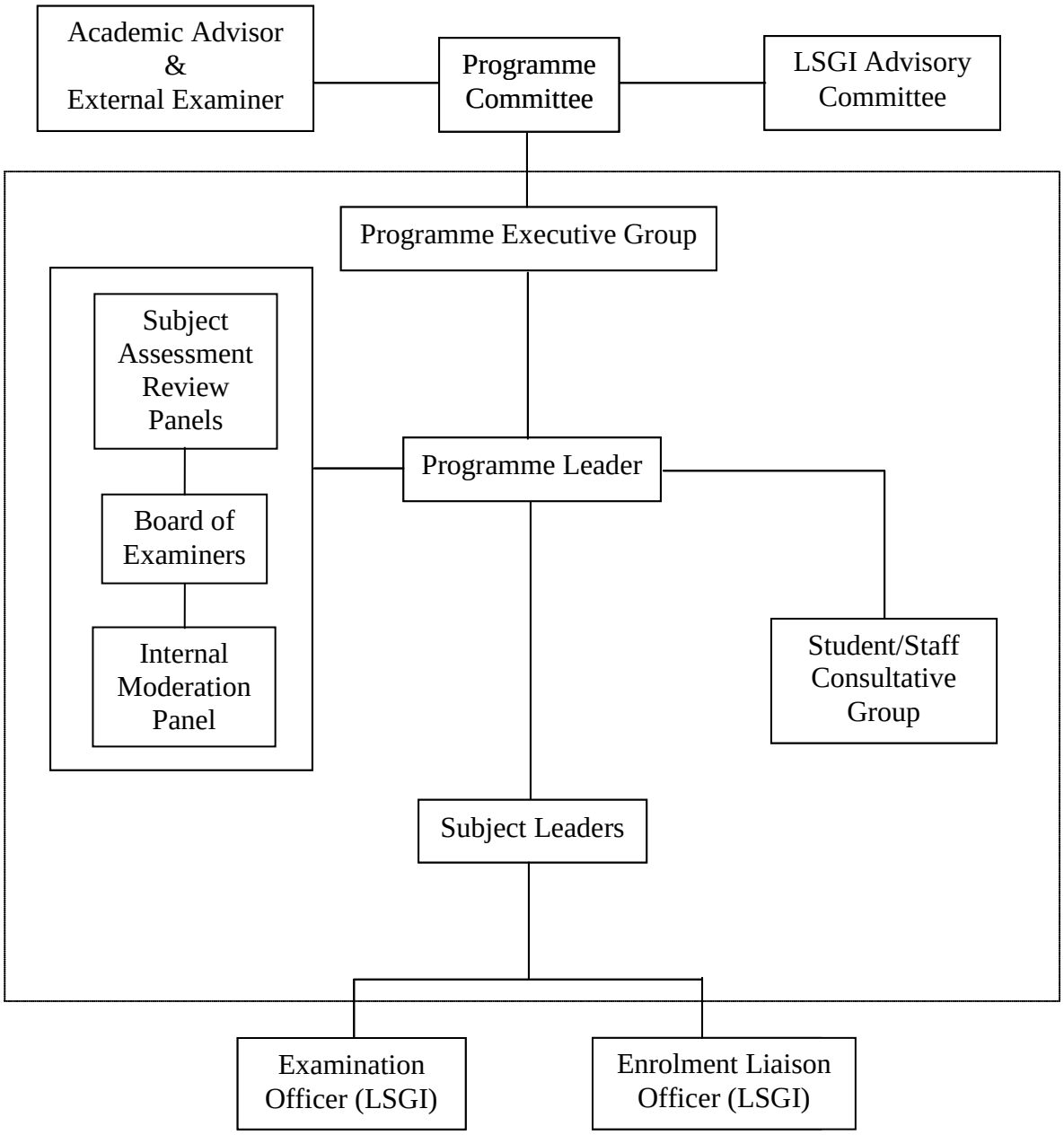

Figure 7.1 : Programme Management Structure

7.11 Student Feedback Mechanism

Student views are solicited through the following channels:

(a) Comments of student representatives in course committee meetings

(b) Faculty(CLU) Student feedback questionnaire (SFQ) http://edc.polyu.edu.hk/sfq-student.htm

(c) Staff-student consultative committee meetings

(d) informal communications

(e) email communications

PLAGIARISM AND BIBLIOGRAPHIC REFERENCING

(extracted from Student Handbook 2005-2006)

The University views plagiarism and copying of copyright materials, without the licence of the copyright owner, as a serious disciplinary offence. These guidance notes aim to help students of the University comply with the Institution's policy on plagiarism in coursework, bibliographic referencing and photocopying of copyright materials.

What is plagiarism?

'To take (words, ideas, etc.) from someone else's work and use them in one's own work without admitting one has done so.' (*Longman Dictionary of Contemporary English*, 1987)

'... The action of using or copying someone else's idea or work and pretending that you thought of it or created it.' (*Collins Cobuild English Language Dictionary*, 1987)

'... The taking and using as one's own of the thoughts, writings, or inventions of another.' (*Shorter Oxford English Dictionary*, 1973)

'To steal or pass off (the ideas or words of another) as one's own: [to] use (a created production) without crediting the source: [to] commit literary theft: [to] present as new and original an idea or product derived from an existing source.' (*Webster's Ninth New Collegiate Dictionary*, 1987)

'The appropriation or imitation of another's ideas and manner of expressing them ... to be passed off as one's own.' (*Macquarie Dictionary*, 1985)

The above definitions all suggest that plagiarism involves the idea of intending to plagiarise; it is important to realize that this dishonest intention will be assumed. Excuses such as "having forgotten" to insert quotation marks, or "not having remembered" that an idea was someone else's, or "having thought the reader would understand" that a passage was a paraphrase of someone else's words cannot be accepted. In a similar way, it will be assumed that those who walk out of a shop carrying goods which they have not paid for, and do not intend to pay can be accused of shoplifting.

In short, it is the students' responsibility to avoid any possible suggestion of plagiarism in their work. The golden rule is "if in doubt, acknowledge" - this should be followed in all "grey areas", i.e. cases in which you are not sure whether the acknowledgement of a source is necessary or not.

You can visit the website at http://edc.polyu.edu.hk/PSP/student.htm for more detailed explanations on plagiarism.

How are Sources Referred to?

There are two ways of referring to a source: by using direct quotations, or by paraphrasing the author's words. Each of these is exemplified below.

<u>Using Direct Quotations</u>

- A quotation integrated with the text, e.g.

  'The coal reserves,' said Thomas J. Johnson (1982, p.21) 'will not deplete as rapidly as oil reserves', and this claim is already being borne out by experience.

- A quotation presented as an indented paragraph, e.g.

  Conflict within the marketing channel required its own definitions, and one of the first of these was established by Stern and Gorman (1969, p.58). Their view was that a conflict was a process of system changes: ' ... a change occurs in the task environment or within a channel member's

organisation that eventually has implications for the channel members ... when the other affected members perceive the change as cause of frustration, a conflict situation emerges.'

Note the use of the three-full-stop device (...), separated by one space from the preceding and/or following words, to indicate a word or words have been omitted from the original. (The assumption is, of course, that the omission has not changed the sense of the author's words.)

Secondly, note the use of square brackets, [ ], to indicate that a word has been added or replaced to clarify (but not of course to alter) the author's original meaning, e.g.

Original Registers are, then, types of text, not types of discourse, since they are not defined in terms of what kind of communication they represent.

Quotation '... [registers] are not defined in terms of what kind of communication they represent' (H.G. Widdowson, 1973).

Thirdly, note that where the original itself includes a word or words between inverted commas or quotation marks, a quotation should reproduce this by using double inverted commas between single ones, or vice-versa, e.g.

Original One obvious development within a pedagogical grammar would be to use Searle's illocutionary acts to fill in Halliday's 'relevant models of language'.

Quotation As Widdowson (1973) points out: 'One obvious development within a pedagogical grammar would be to use Searle's illocutionary acts to fill in Halliday's "relevant models of language"', but this suggestion has yet to be followed up. (Alternatively: "... Halliday's 'relevant models of language'".)

Fourthly, note that italics in the original may be reproduced by underlining in a quotation. If the underlining is not the original's, then this should be made clear. The usual method is to add a note in brackets after the quotation: (my emphasis), (my underlining) or (emphasis added). If one wants to make it quite clear that the emphasis is the original's, one can add: (emphasis as in the original).

<u>Paraphrasing the Author's Words</u>

Paraphrasing is not simply altering a word here and there, but rather rewording the original - either to shorten/summarise or to expand/clarify. Paraphrasing often leads into 'grey areas' where one may be unsure of whether or not plagiarism could be alleged, so remember the golden rule: 'if in doubt, acknowledge'. In particular, a lengthy piece of paraphrasing (say, several paragraphs) should remind the reader at frequent intervals – at least once per paragraph - of the source.

- Paraphrasing which shortens/summarises, e.g.

Original 'There are many abusive parents for whom [therapy] groups may be the only answer, not only because of the quality of services offered, or the potential benefits they promise, but chiefly for the fact that a group of this type is the only service that some abusive parents will attend and participate in.' Blizinsky, M. (1982, p.311)

Paraphrase Martin Blizinsky (1982, p.311) believes that therapy-group sessions may be the only answer for some abusive parents, being the only programme in which they will participate.

- Paraphrasing which expands/clarifies, e.g.

Original 'Although photosynthesis is the principal autotrophic process, chemosynthesis also occurs.' I. Pearson (1978, p.135)

Paraphrase As Pearson points out (English in Biological Sciences, 1978, p.135), although photosynthesis - the process by which plants make their own food with the help of sunlight - is the major self-feeding process, synthesis involving chemical reactions also takes place.

How to Cite Bibliographic References?

The following guidance notes, which aim to help students with bibliographic referencing, address the question of how, rather than whether, to acknowledge the sources.

Bibliographic references identify the work in question (usually either a book or an article), and give sufficient information on the author, title, publisher and date of publication for this identifica tion to be quite clear and unambiguous. Such references are normally written according to fixed conventions, which it is sensible to follow; one set of these conventions is outlined below.

For books: author's surname first, followed by the initials of his/her other name(s), then by the full title of the book *underlined*; this underlining will be replaced by italics in printed text (as opposed to typescript or handwriting). There then follows the place of publication - usually a city - then the name of the publisher, and lastly the date of publication, e.g.

Crane, D. *Invisible Colleges*. Chicago: University of Chicago Press, 1972.

Where there is more than one author, the examples are:

- Crystal, D. and Davy, D. *Advanced Conversational English*. Harlow: Longman, 1975.

- Brazil, D., Coulthard, M. and Johns, C. *Discourse Intonation and Language Teaching*. Harlow: Longman, 1980.

Where the book is a collection (of articles or monographs) rather than a single text, the examples are:

- Pride, J .B. ed. *Sociolinguistic Aspects of Language Learning and Teaching*. Oxford: Oxford University Press, 1979.

- Ric hards, J.C. and Nunan, D. eds. *Second Language Teacher Education*. Cambridge: Cambridge University Press, 1990.

***For articles in a collection*:** similar to book references, but the author and title of the article come first, e.g.

Pennington, M.C. A professional development focus for the language teaching practicum. In Richards, J.C. and Nunan, D. eds. *Second Language Teacher Education*. Cambridge: Cambridge University Press, 1990.

***For articles in a journal (serial)*:** much as above, except that information on the journal replaces that on the book (collection), e.g.

Stieg, M.F. The information needs of historians. *College and Research Libraries*, 1981, 42(6), 549-560.

The figures '42(6)' mean 'volume 42, no.6'; the figures '549-560' mean 'pages 549 to 560'. Note also that capital letters are not usual in the titles of articles (though in those of books, of course, they are).

Bibliographic references can be placed as footnotes to the text, or far better, listed alphabetically (by author) in a 'bibliography' at the end of the text. If a bibliography is used, references in the text need only state the author(s) and the publication date, e.g.

Conflict within the marketing channel required its own definitions, and one of the first of these was established by Stern and Gorman (1969).

If the bibliography contains two or more publications by the same author(s) in the same year, identify them as 1969a, 1969b, etc.

If the text does make references to books/articles in this way, then the bibliography should put the publication date after the author's name, rather than at the end, e.g.

Crane, D., 1972. *Invisible Colleges*. Chicago: University of Chicago Press.

Finally, minor differences from the above conventions may be found, as between one published bibliography and another, but these are unimportant; what does matter is that consistency in following one set of convention is ensured. Not only should the information in the bibliography be correct in every detail (author's name and initials, publisher's name, etc.), complete typographical accuracy - spacing, punctuation, etc. is also very important. Thorough proofreading is essential here, as in the rest of the text, and is a measure of the care that has been taken; conversely, a text full of "typos" (typographical errors), misspellings, inconsistencies, etc. is not only evidence of carelessness but also very irritating for the audience - the reader - and thus obviously counter-productive.

Intellectual Property

Intellectual property created by students in the course of their study at the University shall be owned by the University only if the student receives financial support from the University in the form of wages, salary or stipends for undertaking their study or research in the University; makes material use of the University's resources for his/her research work; receives material guidance and intellectual input from the University's staff for his/her research work; or if his/her research work is funded by a grant to the University or to him/her by virtue of his/her employment by the University. Generally speaking, intellectual property rights, among other things, refers to novel information and ideas which the law protects. It means the material or communicable result of scientific, humanistic, literary, and artistic effort. It includes, but is not limited to, works in the forms of copyright, design, inventions, discoveries, trademark, formulae, processes, computer software, drawings and sculpture, journal articles and conference presentations.

The University will ensure that it will give its full support to the protection of the intellectual property created by students. If such intellectual property is of potential commercial and industrial value, the University will also give its support to the commercialisation of the intellectual property and that students will receive an appropriate share of any revenue arising from such commercialisation after deducting all the expenditure incurred. The University has its formulated policy in terms of intellectual property.

Photocopying of Copyright Materials

The University considers the protection of intellectual property a serious matter and copying of copyright materials, without the licence of copyright owner, may be regarded as a statutory offence. Students should comply with the Copyright Ordinance then prevailing at all times.

Under the Copyright Ordinance, a copyright in a work is infringed by a person who, without the licence of the copyright owner, among other things, copies the work, issues or makes available copies of the work to the public. Copying of a work means reproducing the work in any material form, including storing the work in any medium by electronic means. Making copies of the work available to public includes putting it on the Internet.

Any printed material in book or volume form which carries a claim to copyright either on the reverse side of the title page, or next to it, is copyright protected. All materials in all periodicals are normally presumed to be copyright protected.

Under Hong Kong Law:

- A person who, without the licence of the copyright owner, sells, offers for sale or distributes an infringing copy of the work for the purpose of trade or business commits an offence punishable by a fine of HK$50,000 in respect of each infringing copy and imprisonment for 4 years, the person is also subject to action for damage (or for handing over the profits) by the copyright owner.

- It is also an offence if a person who, without the licence of the copyright owner, distributes otherwise than for the purpose of trade or business to such an extent as to affect prejudicially the owner of the copyright, an infringing copy of a copyright work, the person will also be liable in the same way as mentioned above.

There are certain acts permitted in relation to copyright works. In general, fair dealing with a work of any description for the purposes of research or private study does not infringe any copyright in the work.

Librarian of a "specified library" may, if the prescribed conditions are complied with:

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SUBJECT SYLLABI

(LSGI SUBJECTS)

arranged in alphabetical order

All subjects have no co-requisites and exclusions.

Subject Code	LSGI326	**Cartography**	
Credit	3	Syllabus designer(s)	Zhilin Li
Level	3	Pre-requisites	LSGI228 Mapping
Weight	0.3	Assessment Method	Continuous assessment: 100%
Contact Hour	Lect/Tut : 28 PW : 21		

PART A – Subject specific information

Aims

The aims of this subject are:

- To provide an understanding of the fundamental principles and techniques of cartography
- To enable students become proficient in the use of conventional and modern cartographic techniques
- To enable students properly apply cartographic principles and methods to practical problems

Class discussions and group project will facilitate development of team spirit, critical thinking and problem solving skills, as well as communication and presentation skills.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Define various types of visual representations (L1)
- Explain the techniques for thematic mapping and visualization (L2)
- Interpret maps and other graphic products (L3)
- Apply different mapping techniques for a given set of data (L4)
- Critically analyze cartographic products (L3)
- Confidently design and execute a cartographic project according to client's requirements (L4)

Keyword Syllabus

A. Principles and theories for symbol and map design.
Visual variables, colour scheme, visual information processing, perceptional theories, map perception, map evaluation.

B. Geographical data versus type of thematic maps:
The nature of data, measurement scale, quantitative and qualitative maps, classification of thematic maps, data classification schemes.

C. Techniques for thematic mapping:
Dot mapping, proportional symbol mapping, flow line mapping, area (choropleth) mapping, volume mapping.

D. Scale and generalization:
Theories and principles of map generalization in digital environment, algorithms for various operations in both vector and raster modes, automated systems.

E. Visualization:
Variables for visualization (dynamic variable, screen variables, exploration acts, web-specific variables), cartograms, pictorial maps, dynamic maps, rendering and animations.

F. *Other maps*.
Nautical charts, tourist maps, Web maps, multimedia, electronic maps, etc.

Content Distribution

A	B	C	D	E	F
25%	15%	25%	20%	10%	5%

PART B - Teacher specific information

Teaching and Learning Methods

Students will gain the theories and methodologies in normal lectures. Students will then gain the practical experience through well-designed lab sessions and a small individual project. A group project will then follow to develop students' high-level cognitive understanding and integration of knowledge.

Assessment Methods

- Small tests set at different understanding levels will be set to test students' understanding of the theories, techniques and methodology;
- Students will be assessed of their cartographic techniques in lab sessions, by submission of practical reports and individual project report;
- The outcomes on critical analysis, integration of knowledge and project design will be assessed by group project report.

Reading List

Text:

1. Dent, B. 1999. *Cartography: Thematic Map Design*. 5th edition, Wm C. Brown Publishers. 417pp.

References:

1. Robinson, A. et al., (1995). *Elements of Cartography*. 6th edition, John Wiley & Sons Inc. 674pp.
2. Slocum, T., McMaster, R., Kessler, F. and Howard, H., 2004. *Thematic Cartography and Geographic Visualization*, Second Edition, Jul 2004, Pearson Education, 528 pages.
3. MacEachren, A. and D. Taylor (eds.) (1994). *Visualization in Modern Cartography*. Pergamon. 345pp.
4. Kraak, M.-J., and Brown, A. (eds.), Web Cartography. Taylor and Francis, 213pp.
5. Keates, J., (1989). *Cartographic Design and Production*. 2nd edition, Longman. 261pp.

Subject Code	LSGI3343	**Communication and Positioning**	
Credit	3	Syllabus designer(s)	Esmond Mok, Geoffrey Shea
Level	3	Pre-requisites	Nil
Weight	0.3	Assessment Method	Continuous assessment: 100%
Contact Hour	Lect/Tut : 21 PW : 42		

PART A – Subject specific information

Aims

This subject aims at providing students an opportunity to explore different up-to-date communication and positioning systems relevant to spatial data collection, and their integration with GIS for different applications. In-class discussions and reflective journal writing will also facilitate students' English communication ability.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Explain the concepts of different communication and positioning systems listed in the keyword syllabus (L3)
- Apply cutting edge technologies of communication and positioning to a GIS systems (L4)

Keyword Syllabus

A. Communications

1) Electromagnetic waves and propagation properties in space
2) Signal modulation and demodulation
3) Concepts of communication systems, transmitter, receiver, security
4) Satellite based communication systems
5) Mobile communication systems
6) Radio Frequency Identification (RFID) System

B. Positioning

1) Ground based radio navigation navigation systems
2) Satellite based positioning systems
3) Multi-sensor systems

C. Integration of communication and positioning technologies to GIS

Content Distribution

A	B	C
40%	40%	20%

PART B - Teacher specific information

Teaching and Learning Methods

Background knowledge will first be addressed in formal lectures. Computer simulations and examples will be used to demonstrate concepts and principles of signal propagation, communication and positioning techniques. After students have acquired the necessary background knowledge, students will be facilitated discussions on strengths and weaknesses of different communications and positioning methods, ways for improving the performance and applications. Integration of GIS with different positioning and communication will be discussed using prototypes developed from research in related areas.

Assessment Methods

In-class quizzes will be conducted as developmental assessments to reinforce the learning process.
The following summative assessments will be conducted:

- Phase tests
- Reflective Journal
- Mini Project

In addition to phase tests on conceptual understanding of subject materials, students are required to write a reflective journal on what have learned after completing each practical exercise. A mini project will be carried out to develop students' ability on part C of the keyword syllabus.

Recommended Reading List

1. YQ Chen, Yuk-Cheung Lee (eds.) 2001. *Geographical Data Acquisition*, Springer Wien New Yok.
2. Burkhardt, J., Henn, H., Hepper, S., Raindtorff, K. and Schaeck, T., 2002, *Pervasive Computing: Technology and Architecture of Mobile Internet Applications*, Addison-Wesley.
3. Tan, K.L. Tan and Ooi, B.C., 2002, *Data Dissemination in Wireless Computing Environments*, Kluwer Academic Publishers.
4. Jing, J. and Joshi, A., 1999, *Mobile Data Management and Applications*, Kluwer Academic Publishers.
5. Mann, S., *Programming Applications with the Wireless Application Protocol: The Complete Developer's Guide*, Wiley, 2000.
6. Shepard, S., 2005, *RFID: radio frequency identification*, McGraw-Hill. RFID Journal, online version available at http://www.rfidjournal.com

Supplementary:

1. Burkhardt, J., Henn, H., Hepper, S., Raindtorff, K. and Schaeck, T., 2002, *Pervasive Computing: Technology and Architecture of Mobile Internet Applications*, Addison-Wesley.
2. Tan, K.L. Tan and Ooi, B.C., 2002, *Data Dissemination in Wireless Computing Environments*,Kluwer Academic Publishers.
3. Jing, J. and Joshi, A., 1999, *Mobile Data Management and Applications*, Kluwer Academic Publishers.
4. Mann, S., *Programming Applications with the Wireless Application Protocol: The Complete Developer's Guide*, Wiley, 2000.
5. Shepard, S., 2005, *RFID: radio frequency identification*, McGraw-Hill.
6. RFID Journal, online version available at http://www.rfidjournal.com

Subject Code	LSGI2294	**Computer Aided Drafting and Processing for Geomatics**	
Credit	3	Syllabus designer(s)	Geoffrey Shea
Level	2	Pre-requisites	Nil
Weight	0.2	Assessment Method	Continuous assessment: 100%
Contact Hour	Lect/Tut : 14 PW : 56		

PART A - Subject specific information

Aims

The aim of this subject is to allow students gain solid knowledge and hands-on experience in scientific computing tools such as Matlab and computer aided drafting software packages. Through the use of these software package students should acquire working experience to use, modify, reformat and import/export digital map data for applications in Geomatics. This subject emphasize on independent learning with the help of demonstrations and self-learning package that will help students to develop independent learning ability. Preparation of technical reports will enhance students' English writing and presentation skills.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Explain the architecture of a stand-alone PC, small network environments and Internet (L2)
- Confidently use electronic communication tools (L2)
- Confidently use basic scientific computing tools such as Matlab and Excel (L2)
- Apply a computer aided drafting software package for surveying and mapping (L3)

Keyword Syllabus

A. Introduction To Computer Systems
Major components of computer systems: central processing units, storage devices and media, inputs/outputs; working principle of computers; type of CPU, memory, input/output devices; binary concepts.

B. System Software and Application Software
Functions and operations of system software; features and commands of Microsoft Windows; Introduction to various application software packages.

C. Networking Concepts and Internet Technology

D. Basic Scientific Computing for Surveying and Cartography
Survey and cartographic calculations using Excel and Matlab.

E. Map Design using CAD System
Drawing units, coordinate systems, graphic screen and drawing display control, and Hong Kong grid coordinate system.

F. Map Elements Manipulation Using CAD System
2D element creation and manipulation; group manipulation; layering and symbology; text creation and manipulation; dimensioning.

G. Production of Survey Plan

Using commercial CAD packages to produce survey plans, engineering plans and maps.

Content Distribution

A-C	D	E-F	G
10%	30%	20%	40%

PART B - Teacher specific information

Teaching and Learning Methods

Lectures will be used to introduce the subject materials that are supplemented by demonstrations. Students are expected to gain more hands-on experiences focused on surveying and cartographic applications through formal practical sessions. Individual CAD project is designed to encourage students to acquire in-depth understanding of CAD software through independent self learning and non-contact practical sessions.

Assessment Methods

Continuous assessment consists of two components: Phase Tests and Individual Project. Three phase test will given to assess students' understanding and mastery skills and techniques of two types of application programs, namely, Internet tools, Excel and Matlab. The mastery of knowledge and hands-on experience in CAD software will be examined by an individual CAD project.

Phase Tests		
#1	Topics A~C	15%
#2	Topic D	25%
#3	Topics E~F	40%
Individual CAD project		20%

Reading List

Supplementary:

1. MicroStation Online User's Guide
2. AutoCAD Civil Series Online User's Guide
3. Matlab Online User's Guide
4. Christopher M. Frenz (2002). Visual Basic and Visual Basic .NET for Scientists and Engineers, Apress.
5. Joe Sutphin (2004). AutoCAD 2004 VBA: A programmer's reference, Apress.
6. Andrew G. Roe (1999). Using Visual Basic with AutoCAD, Autodesk Press.
7. Tickoo Sham (2000). AutoCAD 2000: a problem-solving approach, Autodesk Press.
8. Noel Addison (1999). MicroStation 2D by examples, Pen and Brush Publishers.
9. Noel Addison (1995). MicroStation 3D by examples, Pen and Brush Publishers.
10. Michael R. Middleton (2003). Data analysis using Microsoft Excel, Thomson.

Subject Code	LSGI3431	**Data Integration and System Customisation**	
Credit	2	Syllabus designer(s)	Geoffrey Shea
Level	3	Pre-requisites	LSGI2222 Fundamental of GIS
Weight	0.3	Assessment Method	Continuous assessment: 100%
Contact Hour	Lect/Tut : 14 PW : 28		

PART A – Subject specific information

Aims

This subject focuses on advanced Geomatics computing techniques. Its purpose is to provide an awareness of the data integration and system customization in small to medium sized Geomatics project. This subject allows students to develop professional proficiency in performing customization of selected commercial GIS and surveying software packages. The presentation and technical report requirements for group projects will help students developing the English communication skills.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Describe various commercial GIS and surveying software packages (L1)
- Integrate graphic and non-graphic data into a computer system (L3)
- Carry out customisation of a GIS system (L3)

Keyword Syllabus

A. System customisation
- Software specification, prototyping
- OO programming and COM technology
- ArcObjects programming

B. Spatial data integration
- Linking spatial and attribute data
  - Relational, georelational and object-relational databases
- Raster and vector data integration, Conflation

C. Spatial data exchange standards
- Open and proprietary file formats
- GML and data exchange standards
- KML and Google Earth

Content Distribution

A	B	C
50%	15%	35%

PART B - Teacher specific information

Teaching and Learning Methods

A combination of lectures, demonstrations, tutorials and hands-on exercises will be used. Students are expected to gain more hands-on experience through formal practical sessions and completion of group project. Assignments are designed to reinforce in class lectures. Group project is designed to develop students' knowledge and skills in 3 aspects: (i) Problem solving techniques; (ii) Integration of different knowledge acquired in class lectures and self study; and (iii) Team work and group presentation.

Assessment Methods

The understanding of the theories, techniques and methodology will be examined through phase tests. The mastery of skills and techniques will be examined by practical sessions and assignments. The critical analysis, confident implementation of software customisation and team member's contribution are examined by a group project.

Assignments	40%
Test (MCQ)	20%
Group Project	40%

Reading List

1. R. Burke, "*Getting to know ArcObjects: programming ArcGIS with VBA*", ESRI Press, 2003, PolyU call number G70.212.B86 2003.
2. S. Hutchinson, "*Inside ArcView GIS 8.3*", Thomson/Delmar Learning, 2004, PolyU call number G70.212.H872 2004.
3. P. Hohl, "*GIS data conversion: Strategies, techniques, management*", On Word Press, 1998, PolyU call number G70.212.G572 1998.
4. P. Rigaux, M. Scholl, A. Voisard, "*Spatial Databases with application to GIS*", Morgan Kaufmann, 2002, PolyU call number G70.212.R54 2002.
5. M. F. Worboys and M. Duckham, "*GIS, a Computer Perspective*", Second edition, CRC Press, 2004, PolyU call number G70.2.W66 2004.
6. M. F. Worboys and M. Duckham, "*GIS, a Computer Perspective*", online resources available at http://worboys.duckham.org

Subject Code	LSGI3242	**Digital Terrain Modelling and Visualization**	
Credit	3	Syllabus designer(s)	Zhilin Li
Level	3	Pre-requisites	Nil
Weight	0.3	Assessment Method	Continuous assessment: 100%
Contact Hour	Lect/Tut : 28 PW : 28		

PART A – Subject specific information

Aims

The aims of this subject are:

- To provide an understanding of the fundamental principles and techniques of Digital terrain modeling and visualization;
- To enable students become proficient in the use of conventional and modern techniques for digital terrain modeling and visualization;
- To enable students to properly apply cartographic principles and methods to practical terrain modeling and visualization problems.

English communication skills, team spirit and critical thinking attributes will be fostered in the teaching and learning process, through mini individual and group projects and class discussions.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Define various types of terrain modeling and visualization techniques (L2)
- Explain the triangulation and interpolation techniques (L3)
- Interpret various types of terrain parameters (L3)
- Apply different modelling techniques for a given set of data; (L4)
- Critically analyze DTM products (L3)
- Confidently design and execute a DTM project according to client's requirements (L4)

Keyword Syllabus

A. Acquisition of DTM source data
Terrain analysis; sampling strategy; acquisition techniques; characteristics of DTM sources data.

B. Modelling theory and algorithms
Surface modeling approaches; grid network formation; triangular irregular network (TIN) formation, interpolation techniques.

C. Quality control
Noise filtering, gross error detection, mathematical models for DTM accuracy prediction.

D. Information extraction from DTM
Geometric, morphological, hydrological and visibility parameters; contouring techniques

E. DTM data management
Storage, Multi-scale DTM at a national level, compression, transfer standards.

F. Visualization of DTM

Rendering techniques for shading, colouring, animation (flying-through, texture mapping), virtual landscape, level of details.

G. DTM applications

Mapping, remote sensing, photogrammetry, civil engineering, miming engineering, military engineering, geomorphology, geology, planning and landscape design, forestry, environmental studies and so on.

Content Distribution

A	B	C	D	E	F	G
10%	35%	10%	15%	5%	15%	10%

PART B - Teacher specific information

Teaching and Learning Methods

Students will gain the theories and methodologies in normal lectures. Students will then gain the practical experience through well-designed lab sessions and a small individual project. A group project will then follow to develop students' high-level cognitive understanding and integration of knowledge.

Assessment Methods

- Small tests set at different understanding levels will be set to test students' understanding of the theories, techniques and methodology;
- Students will be assessed of their thematic mapping and visualization techniques in lab sessions, by submission of practical reports and individual project report;
- The outcomes on critical analysis, integration of knowledge and project design will be assessed by group project report.

Reading List

Text:

1. Li, Z.L., Zhu, Q. and Gold, C., 2005. *Digital Terrain Modelling: Principles and Methodology*. CRC Press (Taylor & Francis Group). (**ISBN:** 0415324629). 323pp.

References:

1. Maune, D.F. (ed.), *Digital Elevation Model Techniques and Applications: The DEM User Manual*. American Society for Photogrammetry and Remote Sensing, Bethesda, Maryland. 539pp.
2. Olea, R. A., 1999. *Geostatistics for engineers and earth scientists***.** Boston : Kluwer Academic.
3. Petrie, G. and Kennie, T. (eds.), 1990. *Terrain Modelling in Surveying and Civil Engineering*, Whittles Publishing, Caitness, England. 351pp.
4. Phillips, G. M., 2003. *Interpolation and approximation by polynomials.* New York : Springer.
5. Sakhnovich, L. A., 1997., *Interpolation theory and its applications*. Dordrecht ; Boston : Kluwer Academic Publishers.
6. Su, B.Q., 1989. *Computational geometry : curve and surface modeling.* Boston : Academic Press.

7. Watson, D. F., 1992. *Contouring : a guide to the analysis and display of spatial data.* Oxford ; New York: Pergamon Press.

8. Wilson, J.P. and Gallant, J. (eds.), 2000. *Terrain Analysis: Principle and applications.* John Wiley & Sons, Inc. Singapore, 479pp.

Subject Code	LSGI2361	**Field Scheme I**	
Credit	3	Syllabus designer(s)	Esmond Mok
Level	2	Pre-requisites	Nil
Weight	0.2	Assessment Method	Continuous assessment: 100%
Contact Hour	PW : 84		

PART A – Subject specific information

Aims

The aims of this subject are:

- To provide an opportunity for students to consolidate, integrate and practice the knowledge and skills learnt in subject areas of fundamental surveying, mapping and survey data analysis.
- To enhance students' ability and skills in project planning and organization, logistics design and implementation, problem identification and solving, as well as working in a group environment.
- To train the professionalism of the students in their work, especially in carrying out field survey, taking field notes, checking and analysis of data, presentation of results, and caring of survey instruments.

This project emphasizes on team work, project management and problem solving in real environment, hence will help students develop communication, critical and creative thinking, and cooperative attitudes and behaviour of working with others.

Outcomes of professional/academic knowledge and skills

At the end of this subject students will be able to integrate the knowledge learnt in Surveying I and Mapping, to manage and carry out a survey project according to client's specifications. The project work will involve control survey, topographical and detail survey, production of manual plans of survey and report writing. (L3)

PART B - Teacher specific information

Teaching and Learning Methods

Students and supervisors are in residence together at or near the project area for the period of two weeks during which time all field data is collected. The task is to prepare a large-scale topographic map of an area with moderate variations in terrain elevation and having broad range of both natural and artificial features.
Before start of the project a briefing on site safety will be given by the supervisors. Moreover, basic survey specification will be drawn up for the task with assistance of the supervisors. Groups will be responsible for the planning and organization of their work schedule.

Students usually work in groups of three. Each group will be elected a group representative. The group representatives will meet with supervising staff every night to report on the group's progress and to discuss resource allocation and difficulties encountered. Supervisors can also use this time to give advice. Collection of field data is followed by the finalization of the topographic map, reports etc. Submission of which represents the completion of the survey camp.

The survey camp will be divided into two stages:

First Stage

This is the developmental stage where students will be given feedbacks on-site of their performance and suggested improvements. At this stage, surveying will be carried out using basic surveying equipment such as optical-mechanical theodolites, automatic levels, leveling staff and steel tapes. The purpose is to enhance students' proficiency in managing the project with limited supply of conventional types of survey equipment, to carry out field observations, booking and checking, as well as data reduction and survey plan production.

Second Stage

This is the judgmental stage. The project is very similar to the first-stage one, except that modern digital equipment and software will be used for mapping and survey plan production.

These two stages' learning process will help students to develop communication skills, creative and critical thinking; to enable students to understand and appreciate the importance of team work; to provide students opportunities to develop resource, time and manpower management; and leadership skill.

Assessment Methods

Student performance will be assessed based on their field performance and an oral examination conducted at the end of the survey camp. Assessment areas will be based on the following:

1. Activities and documentation conforming to professional standards throughout;
2. Planning activity by each student, prior the period of field data collection, is acceptable to the staff supervisor of his/her group;
3. Processing of work to the satisfaction of the group supervisors,
4. Fair drawn plots of the control scheme and survey, the referenced field data and computations, and a short report describing the methods used to complete the survey and produced by each student group within two weeks of the end of period of residence at or near the project area.

Subject Code	LSGI2222	**Fundamentals of GIS**	
Credit	3	Syllabus designer(s)	Lilian Pun
Level	2	Pre-requisites	Nil
Weight	0.2	Assessment Method	Continuous assessment: 100%
Contact Hour	Lect/Tut : 28 PW : 28		

PART A – Subject specific information

Aims

This subject aims at presenting the fundamental concepts of geographic information systems, with emphasis on those related to the structuring and analysis of spatial data. It also provides an appreciation of the operation of GIS software to carry out what have been learnt theoretically. Individual and group discussions, and project reports will foster students' English communication and critical thinking.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Grasp a general understanding of GIS concepts / theories (L1)
- Master the operation of at least one GIS software (L1)
- Able to construct a small spatial database with relevant attribute data, perform a simple analysis of spatial pattern and present results graphically (L1 & L2)

Keyword Syllabus

A. Overview
Evolution of GIS, its development and relationships with other disciplines; an overview of the basic functions of GIS and how GIS is different from CAD and database systems.

B. Hardware and Software Components
Brief introduction to the user interface, the database, the software, the storage devices, the digitizer, the scanner and the display devices.

C. Digitising and Scanning, Map Registration and Coordinate Systems
Operation and accuracy of digitizing tables and scanners; storage of coordinates; effect of map projections on distance and area measurements; resolution and its effect on data.

D. Space model and Spatial Features
Space and its tessellations; nature of spatial features, their entities and relationships; interpreting different classes of features from maps.

E. Spatial Data Structures
The structures of simple data types such as point, line, text and image; vector and raster representation of spatial features – comparison and conversion; symbolisation of spatial features; graphic editing.

F. Management of attributes in database
Difference between spatial and non-spatial attributes; procedures of tagging attributes to features and linking up attributes from different databases; use of primary identifier.

G. Topological Data Structures
The need for topology; elementary graph theory; simple topological data structures; essence of topology building.

H. Spatial Query and Analysis
Use of retrieval functions to find spatial features and to obtain their attribute values; operation and basic algorithms for simple topological analysis, buffer zone generation and overlay analysis.

I. Hong Kong Spatial Data Infrastructure
Brief introduction of Hong Kong digital map data, e.g. the Computerized Land Information System (CLIS) and its BMS, GIRS, CIS.

Content Distribution

A	B	C	D	E	F	G	H	I
5%	5%	10%	10%	15%	15%	15%	15%	10%

PART B - Teacher specific information

Teaching and Learning Methods

Teaching and learning will largely be conducted through an on-line delivery platform. The subject materials, work examples, useful web sites and required readings will be uploaded to the on-line platform for students' easy reference. The contact hours will be used for lecturing the theory and concepts, individual and group discussions. In addition, a time table for specific topics will be scheduled and a quiz will be used as formative assessment in order to help students to further identify their strengths and weaknesses.

Students' knowledge and practical skills will be developed in the assigned practical sessions. A written report along with series of data has to be produced. After finishing these exercises, students will be able to grasp a basic but solid understanding of GIS concepts for further advanced GIS subjects in their later stages of studies.

Assessment Methods

Students' knowledge and skills will be continuously assessed with the practical exercises assigned each week, a quiz testing the basic concepts as well as an examination at the end of the term.

Reading List

1. Aranoff, S. (1990) *Geographic Information Systems: A Management Perspective*; WDL Publications.
2. Chang, K.T. (2002) *Introduction to Geographic Information Systems*, McGraw-Hill Higher Education.
3. Chen, Y.Q. & Lee, Y.C. (eds) (2001) *Geographical Data Acquisition,* Springer Wien New York.
4. Clarke, K.C. (1990) *Analytical and Computer Cartography*, Englewood Cliffs, N.J.: Prentice-Hall.
5. Laurini, R. & Thompson, D. (1992) *Fundamentals of Spatial Information Systems*, London: Academic Press.
6. Peuquet, M. (1990) *Introductory Readings in Geographic Information Systems,* Taylor & Francis.

7. Rhind, D. W. (1991) *Geographical Information System: Principles and Applications*, Harlow, Essex, England: Longman Scientific and Technical; New York: Wiley.

8. Robinson, A.H. & Sale, R. (1995) *Elements of Cartography*, 6th ed., New York: John Wiley & Sons, Inc.

Subject Code	LSGI4321	**Geoinformation for Urban and Regional Studies**	
Credit	3	Syllabus designer(s)	Janet Nichol
Level	4	Pre-requisites	(1) LSGI2222 Fundamentals of GIS; (2) LSGI326 Cartography
Weight	0.4	Assessment Method	Examination: 40% Continuous assessment: 60%
Contact Hour	Lect/Tut : 28 PW : 28		

PART A – Subject specific information

Aims

This course aims to build on coursework in previous years. It will give students a basis to apply the skills and techniques learned to logistical and practical problems of cities and regions, including land use allocation and suitability assessment, landscape assessment and the impacts of urban growth. As a foundation for the applied issues to be addressed during the course, students will be familiarised with some basic planning concepts concerning land use, land development, infrastructural and landscape planning. Students are also expected to learn how to prioritise needs and work efficiently in a professional context, problem solving and communication skills through in-class discussions, on-line forum discussions and presentations.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will:

Have a working knowledge of planning concepts, issues and processes (L2)
- Be familiar with the procedures involved in land use planning and environmental impact assessment (L2)
- Have the experience and skills to collect and manage these datasets (L3)
- Be able to evaluate the fitness for use of such data (L4)
- Be able to integrate data from different sources and scales (L4)
- Be able to design a project using Geo-IT applied to an urban or rural planning problem (L4)

Keyboard Syllabus

A. Introduction to Urban and Regional Planning: concepts of land use and land cover

B. Urban growth, development planning and structure plans

C. The role of spatial analysis in urban and regional planning and the importance of scale

D. Datasets for land use and development planning, databases and database management, the role of spatial analysis

E. Applications of geoinformation in urban planning and management – decision-making and land suitability analysis, landscape assessment

F. Applications of geoinformation in urban planning and management – Environmental Impact Assessment and managing urban growth

G. Cyber city – modeling and visualization in urban planning

Content Distribution

A	B	C	D	E	F	G
5%	15%	15%	15%	20%	15%	15%

PART B Teacher specific information

Teaching and Learning Methods

Teaching and learning materials will be provided on-line for students to download easily. Contact hours will be used for formal lectures, in-class discussions and presentations, and practical work. On-line forum discussions will be scheduled for topics on selected planning problems, for students to identify their level of understanding, and these will be used as an additional form of course assessment.

Assessment Methods

The course emphasizes continuous assessment, which consists of two components: a phase test and practical work. The phase test will assess students' independent understanding of basic concepts of land use and urban growth. Practical work will be used to assess students' ability to process and manage planning data in a spatial context. A short written examination will be given to test students' independent ability understand planning issues and theories, and to conceptualise holistic issues relating to the course experience.

Reading List

Text:

1. Longley, P., M. Goodchild, D. Maguire and D. Rhind, 1999, Geographic Information Systems (2nd Edition), John Wiley & Sons, INC., USA.
2. Beraitos, E. 2003, Sustainable planning and development, Southampton, WIT.

Journals:

1. International Journal of Geographic Information Systems
2. International Journal of Geographical Information Science
3. Transactions in GIS
4. Landscape and Urban Planning
5. Environment and Planning B

Subject Code	LSGI4302	**Geo-IT in Cadastre and Land Management**	
Credit	3	Syllabus designer(s)	Conrad Tang
Level	4	Pre-requisites	(1) LSGI2222 Fundamentals of GIS; (2) LSGI326 Cartography
Weight	0.4	Assessment Method	Continuous assessment: 100%
Contact Hour	Lect/Tut : 28 PW : 28		

PART A – Subject specific information

Aims

The subject is designed to introduce students to the surveying related legal and professional aspects including real property law and survey law, and to apprehend the development of land administration and cadastral surveying, in particular the digital land data infrastructure of the Hong Kong SAR Government, that are useful in their future professions. The teaching and learning methods adopted will also help students to develop better communication skills, and to gain the global perspective on land registration systems.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Draw on basic knowledge of the land surveying professional and the greater field of land administration in Hong Kong (L2)
- Articulate the legal formation and recording of land rights, explain the roles of land boundary surveying institutes and relevant land related institutions in Hong Kong (L3)
- Carry out information searching on the current development of CAD and GIS data, operation and policy of the government departments under the Environment, Transport and Works Bureau and Housing, Planning and Lands Bureau (L3)
- Develop a critical view on the development and appropriateness of the land administration services within the Hong Kong land market (L4)

Keyword Syllabus

A. Legal System
Law; World law systems
Hong Kong legal system and constitution
Hong Kong court system

B. Contract Law
Contractual obligation
offer and acceptance
intention and certainty
consideration
legal capacity
undue influence
breach of contract and remedy

C. Hong Kong Land Law

Land and property
Tenure & estates
Instrument of conveyance
Types of grants in Hong Kong
Adverse possession; Limitation Ordinance
Chinese customary trusts; Tong & Cho land
Leases, Crown leases, Short-term-tenancy & Licenses
Easement, Covenants, Mortgages, Co-ownership

D. Land Registration

Titles and Deeds registration
Influences on land boundary
Hong Kong Land Registration Ordinance
Hong Kong Land Titles Ordinance
Hong Kong Land Registry

E. Land Survey & related Ordinances

Surveyors Registration Ordinance [Cap 417]
Land Survey Ordinance [Cap 473]
The Hong Kong Institute of Surveyors Ordinance [Cap.1148]

F. Land Administration

Hong Kong Cadastre and related Government departments
Structure and functions of the Lands Department
SMO and land surveying services
LAO and land disposal
Land resumption and the ordinance
Planning Department; Town Planning Board, statutory OZP & DPA

G. Digital Land Data

Cadastre, Land Information System & Spatial Data Infrastructure
Land Information Centre, Survey and Mapping Office
Hong Kong departmental database - Metadata of HPLB and ETWB
Singapore national Land Data Hub

Content Distribution

A	B	C	D	E	F	G
10%	10%	15%	15%	10%	20%	20%

PART B - Teacher specific information

Teaching and Learning Methods

The course is designed to introduce the broad spectrum of land related law, land registration and administration subject materials by on-line delivery mode. Students have to be self-motivated to carry out studying at the department on-line platform. Exercise is used to help building up the key knowledge base of the subject materials.

The Data Alignment Framework projects of the Hong Kong SAR Government are introduced to students by web information searches, invited professional talks, seminars and government department visits.

A hybrid PBL mode is used in the lecture such that key information and concept delivered in the on-line mode will be further discussed and fortified. Discussion and debate on various topics of the Hong Kong land administration system are used to cultivate critical thinking in our tight land-resource society. The use of group presentations by case-based learning mode is gradually increased in the second half of the course.

Assessment Methods

Objective Tests
Quizzes are adopted to measure the students' ability to remember details of government land administration as well as their comprehension of the design, function, procedure and operation of the Hong Kong cadastral system. Written term tests are adopted to measure the students' understanding on the legal formation and recording of land rights, and the roles of land boundary surveying institutes and relevant land related institutions in Hong Kong.

Structured Essay Question
Each student is required write an essay on a cadastral topic. A recommended structure of the essay would be: the design and function of a cadastral operation, the introduction to the institutional and professional arrangement in Hong Kong, an assessment of the operation and recommendation for improvement.

Seminar Presentation
Students work individually, or in teams, to investigate a cadastral topic and present findings in a seminar attending by the class, lecturer and invited professional guests. Half of the scores are graded by peer review.

Project on Common Spatial Units (CSU)
Students work in teams to investigate the institutional arrangement on one selected CSU, produce report and give presentation. The assessment is made on the completeness of the information, presentation skills and the critical view on the development and appropriateness of the land administration services within the Hong Kong land market.

Reading List

Note: the text references are available from library and supplementary reference materials are also available on department electronic teaching folder

A.

Text Dobinson, I. 2001. **Introduction to law in the Hong Kong SAR,** Sweet & Maxwell, 2nd Edition.

Reference

Dept of Justice Homepage http://www.info.gov.hk/justice/index.htm

B.

Text Richards, P., 2004. **Law of contract,** Pearson/Longman, England, Edition 6th ed.

C.

Text Bacon, N., 1996. Conveyancing, 2nd Edition, Law & Tax, pp.1-56.

Reference

Nield, S., 1997. Hong Kong Land Law, Longman, 2nd Edition.

D.

Text Willoughby, P. and Wilkinson, M., 1995. Registration of titles in Hong Kong, Butterworths, pp.1-64.

Reference

Information Package of The Land Registry, Hong Kong, 1996.
Land Registry Home Page http://www.landreg.gov.hk/

E.

Reference

Ordinance Cap 417, 473 & 1148

F.

Text Dale, P. and McLaughlin, J. 1999. **Land administration,** Oxford University Press.

Reference

Lands Department. Land Administration in Hong Kong, Government Printer, Mar 1994.
Lands Department, Hong Kong, Government Printer, Oct 1996.
Planning Dept. Town Planning in Hong Kong – A Quick Reference, 1997
Planning Dept. Hong Kong – City of Vision, Hinge Marketing Ltd, 1996
UN. Land Administration Guidelines. Economic Commission for Europe, United Nations, 1996.
Implementation of Data Alignment Measures for the Alignment of Planning, Lands and Public Works Data, Final Report (Volume 1 to 3), The HKSAR Government, March 2004.

G.

Reference

Metadata Catalogue, Government Information Centre, Website of Survey and Mapping Office, Lands Department at http://www.landsd.gov.hk/mapping/en/metadata/metadata.htm

Land Information Services and Land Survey Services, Web site of Singapore Land Authority at http://www.sla.gov.sg/htm/hom/index.htm

Subject Code	LSGI4322	**Geo-IT in Environmental Management**	
Credit	3	Syllabus designer(s)	Janet Nichol
Level	4	Pre-requisites	(1) LSGI2222 Fundamentals of GIS; (2) LSGI326 Cartography
Weight	0.4	Assessment Method	Examination: 40% Continuous assessment: 60%
Contact Hour	Lect/Tut : 28 PW : 28		

PART A – Subject specific information

Aims

The aims of this subject are:

- To build on coursework in previous years
- To give students a basis to apply the skills and techniques already learned to practical problems of the environment including environmental monitoring, modeling and assessment.
- To enable students to use their understanding of basic ecological concepts and processes, to address environmental issues, both local and international.

The teaching and learning methods adopted will also help students to translate learned skills to practical application, to be able to prioritise needs and work efficiently in a professional context, and to develop the awareness of flexible working approaches – the 'bottom-up' approach from problem to technical solution.

Outcomes of Professional/academic knowledge and skills

At the end of this subject students who gain a pass will:

- Have a working knowledge of ecological concepts and processes (L2)
- Have a working knowledge of current environmental issues and problems (L2)
- Have the ability to fulfill the requirements of Environmental Impact Assessment and those aspects which can be addressed using Geo-IT (L3)
- Understand the current 'state of the art' in the application of Geo-IT to environmental management in Hong Kong (L4)
- Solve problems arising from adverse environmental impacts using Geo-IT skills (L4)
- Be able to integrate environmental data of different scales and from different sources (L4)

Keyword Syllabus

A. Basic ecological concepts and processes

B. Introduction to Environment – environmental concepts and issues in Asia and the world

C. Environmental monitoring and environmental modelling

D. Environmental Impact Assessment – principles and techniques

E. Environmental data and its collection

F. Application of Geo-IT to urban environmental quality: air, noise, congestion

G. Application of Geo-IT to natural resource monitoring and control

H. Project on environmental monitoring and evaluation

Content Distribution

A	B	C	D	E	F	G	H
10%	15%	10%	10%	10%	15%	15%	15%

PART B - Teacher specific information

Teaching and Learning Methods

Teaching and learning materials will be delivered on-line for students to download easily. Contact hours will be used for formal lectures, in-class discussions and presentations, and practical work. On-line forum discussions on selected environmental issues will be scheduled for students to identify their level of understanding, and these will be used as an additional form of course assessment.

Assessment Methods

The course emphasizes continuous assessment, which consists of two components: a phase test and practical work. The phase test will assess students' independent understanding of basic ecological and environmental processes. Practical work will be used to assess students' ability to carry out the spatial procedures for environmental monitoring, and to manage environmental databases. A short written examination will be given to test students' independent ability to translate late basic knowledge and Geo-IT skills into realistic approaches to address environmental problems.

Reading List

Text:

1. Longley, P., M. Goodchild, D. Maguire and D. Rhind, 1999, Geographic Information Systems (2nd Edition), John Wiley & Sons, INC., USA
2. O'Riordan, T. 2000. Environmental Science for Environmental Management. Prentice-Hall, 2nd edition.
3. Jensen, J. Jensen, J. R. 2000 Remote Sensing of the Environment, Prentice-Hall.

Journals:

1. Journal of Environmental Management
2. International Journal of Geographical Information Systems
3. International Journal of Remote Sensing

Subject Code	LSGI4371	**Geo-IT in Logistics & Transportation**	
Credit	3	Syllabus designer(s)	Wu Chen
Level	4	Pre-requisites	(1) LSGI2222 Fundamentals of GIS; (2) LSGI326 Cartography
Weight	0.4	Assessment Method	Continuous assessment: 100%
Contact Hour	Lect/Tut : 28 PW : 28		

PART A – Subject specific information

Aims

The aims of this subject are:

- To provide an understanding of the fundamental principles of Logistics and Transportation.
- To enable students to use Geo-IT to provide solutions to Logistics and transportation problems.

The teaching and learning methods adopted will enhance students' communication and presentation skills, problem analysis and solving skills, as well as develop the cooperative attitudes and behaviour of working with others.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Describe the information required for logistics and transportation (L2)
- Explain the concepts of logistics and transportation (L3)
- Explain spatial-related issues in logistics and transportation (L3)
- Apply GIS, information sensors, and communication systems to solve problems in logistics and transportation (L4)
- Apply GIS, positioning and other technologies for solving spatial-related problems in logistics and transportation.

Keyword Syllabus

A. Introduction to Logistics and Transportation
Concepts of Logistics and transportation, spatial related issues in logistics and transportation

B. Information and Sensors for logistic and transportation applications
Positioning and navigation systems
Conductive loops
Roadside sensors
Radar
CCD camera
RFID
Information for logistics operation and management
Information for transportation planning and traffic management

C. GIS for Transportation and Transportation
GIS data model for transportation, spatial analysis and modeling for transportation, Resource allocation, network flow and facility location, shortest paths and routing

D. Applications

Fleet Management Systems
ITS
Spatial related warehouse
E Logistics for supply chain management

Content Distribution

A	B	C	D
40%	20%	20%	20%

PART B - Teacher specific information

Teaching and Learning Methods

- Lectures to explain the concepts of transportation and logistics
- Group discussions to the application of information technologies in transportation and logistics through case studies to acquire practical problem-solving skills, to become critical in thinking
- A group project is designed to enhance the critical thinking, team spirit, problem solving skill, leadership and presentation skill.

Assessment Methods

- The understanding of the theories, techniques and methodology will be examined through phase tests;
- The mastery of skills and techniques will be examined through case studies and reports;
- The critical analysis, confident application of skills and design of projects are examined by a group project.

Reading List

1. *GIS for Transportation, Principles and Applications*, Miller, H. J. and Shaw, S. L. , Oxford
2. *Geographical Information Systems: Principles and Technical Issues*, Longley, P. A.., Goodchild, M.F., Maguire, D.J. & Rhind, D. W.Vol.1 John Wiley & Sons, Inc.: New York, Chichester, Weinhein, Brisbane, Singapore and Toronto.
3. *Fundamentals of Spatial Information Systems*, Laurini, R. & Thompson, D., London: Academic Press.
4. *Principle and Algorithms of Geographic Information System*, Wu, L.X. and W.Z Shi, Science Press, Beijing.
5. RFID: radio frequency identification, S. Shepard, MaGraw-Hill
6. Location Based services, Morgan Kaufmann Publisher
7. Vehicle location and navigation systems, Zhao, Y., Artech House
8. Application of advanced technology in transportation, proc. Of the 7th int. conf. on application of advanced technology in Transportation, Boston, Aug. 5-7, 2002
9. Transportation Engineering and Planning, PapaCostas, C.S., Upper Saddle River
10. Development and deployment of standards for intelligent transportation systems, review of federal program, Transportation Research Board
11. Intelligent Transportation Systems and vehicle highway automation, Transportation research board

12. Internet GISL Distributed geographic information services for internet and wireless network, Peng, Z.R., Hoboken, NJ Willey
13. Logistics management and strategy, Harrison A., Financial Times/Prentice Hall
14. Global Logistics Management and competitive advantage for new millennium, Gourdin K.N., Blackwell Publisher

Subject Code	LSGI4212	**Geomatics Business Management**	
Credit	3	Syllabus Designer(s)	Conrad Tang, Steve Y. W. Lam
Level	4	Pre-requisites	(1) LSGI 2372 Surveying; (2) LSGI 2222 Fundamentals of GIS
Weight	0.4	Assessment Method	Continuous Assessment: 50% Examination: 50%
Contact Hour	Lect/Tut : 28 PW : 28		

PART A – Subject specific information

Aims

This subject aims at the business management issues of engineering surveying, land boundary surveying and geographic information systems (GIS). The objectives of the course will be to familiarize the students with both the scope and functions of managerial operations associated with cost estimation, tendering, contract administration and total quality management within the three main categories of geomatics business. The teaching and learning adopted will help students develop critical and creative thinking.

Outcomes of professional academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Understand the contemporary environment for geomatics business in Hong Kong (L2)
- Grasp the seven managerial functions of geomatics business (L3)
- Effectively manage the geomatics business and projects (L4)
- Communicate with other professionals (e.g., government agency, contractor and real estate developer) concerning the business requirements of geomatics projects (L4)

Keyword Syllabus

A. Geomatics Business

- Introduction to contemporary business environment
- Approaches to establish geomatics firm
- Forms of business ownership
- Geomatics business plan

B. Managerial Functions of Geomatics Business

- Strategic management
- Marketing management
- Human resources management
- Financial management
- Knowledge/IT management
- Operations management
- Risk management

C. Management of Geomatics Projects

- Management of engineering survey projects
- Management of land boundary survey projects
- Management of GIS projects

D. Professional Ethics and Local Experiences

- Professional ethics of land surveyors and GIS managers
- Anti-corruption measures for geomatics business

Content Distribution

A	B	C	D
30%	30%	30%	10%

PART B - Teacher specific information

Teaching and Learning Methods

The course is designed to adopt interactive lecture such that the basic information of each lecture are made available on-line. The interactive lecture starts by introducing essential basics and uses group activity and debriefing to encourage active thinking and participation. Hybrid PBL and Case-based learning are used increasingly in the lecture to work on local surveying firm cases.

Assessment Methods

- Phase test, and business project and presentation (weighting 50% of total assessment)
- Final written examination (one 3-hour closed-book written exam; weighting 50% of total assessment)

Reference List

1. Zimmerer, T. and Scarborough, N. (2005), *Essentials of Entrepreneurship and Small Business Management*, 4th ed., Pearson Education.
2. Lam, S. (2005). *Engineering Surveying for Civil Engineers: an Algorithmic Approach*. McGraw-Hill Education.
3. Course, L., Hubbard, D. and Wong, E. (2003), *Butterworths Hong Kong Contract Law Handbook*, Hong Kong: Lexis Nexis Butterworths.
4. Willoughby, P. and Wilkinson, M. (1995), *Registration of Titles in Hong Kong*, Hong Kong: Butterworth.
5. SMO (2005), *District Survey Office Technical Manual*. Hong Kong: Survey and Mapping Office, Lands Department.
6. Robillard, R., Wilson, D. and Brown, C. (2002), *Evidence and Procedures for Boundary Location*, 4th ed., New York: Wiley.
7. Harmon, J. (2003), *The Design and Implementation of Geographic Information Systems*, John Wiley & Sons.
8. Aronoff, S. (1989), *Geographic Information Systems: A Management Perspective*, WDL Publications.
9. Huxhold, W. (1994), *Managing Geographic Information System Projects*, New York: Oxford University Press.
10. HKEDC (1996, http://www.icac.org.hk/hkedc), Ethics for Professionals (Architecture, Engineering & Surveying), Hong Kong Ethics Development Centre, ICAC, HKSAR.

Subject Code	LSGI3291	**Geomatics Programming**	
Credit	3	Syllabus designer(s)	Geoffrey Shea
Level	3	Pre-requisites	Nil
Weight	0.3	Assessment Method	Examination: 40% Continuous assessment: 60%
Contact Hour	Lect/Tut : 21 PW : 42		

PART A – Subject specific information

Aims

This subject introduces the programming concepts and techniques. Its purpose is to provide an awareness of the application program development skill and to allow students develop the analytical turn of mind programmers need. Communication skills, cooperative attitudes and behaviour of working with others, and problem solving skills will foster in the teaching and learning process.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Apply the principles of algorithm design techniques to produce a pseudo-code or flowchart for a Geomatics project (L1)
- Confident design and develop intermediate level of Geomatics programs in Visual Basic .NET programming language (L2, L3)
- Confident design and develop functioning graphical user interface in Visual Basic .NET programming language (L2, L3)

Keyword Syllabus

A. Data Types and Data Structures
   a. User defined data types (Point, Line Segment, Line, Polygon, Minimum Bounding Rectangle)
   b. Application of linked-lists and tree data structures

B. Graphical User Interface Concepts and Design
   a. Basic GUI components: Text box, Combo box, List box, Message box, Check box, Radio box, Group box, Panel box, Label, Picture box, Timer.
   b. Menus: Bar menu, Pop-up menu, Tool bar menu.
   c. Single Document Interface (SDI) and Multiple Document Interface (MDI)
   d. Mouse events handling

C. Text String Manipulation and File Processing
   a. Comparing strings
   b. Text extraction
   c. Text formatting
   d. Sequential file processing
   e. Records and random-access files

D. Graphics Programming
   a. Drawing lines, curves, shapes, Text
   b. Filling in shapes with colors, bitmaps, and hatching

c. Working with bitmaps and other graphic images
d. Transformation (Scale, shift, rotate)

E. Geomatics Application Programming Development

a. Angular unit conversions (Degree Minute Second ←→ Decimal Degrees ←→ Radians ←→ Gradients)
b. Leveling calculations (Rise and Fall method, Height of Collimation method, Two-peg test)
c. Angle reductions (Calculation of horizontal distance from slope distance and vertical angle)
d. Linear measurement reductions (Slope correction, standardization, tensioning, temperature variation, sag)
e. Join and Polar calculations
f. Forming minimum bounding rectangles (2 points, multiple points)
g. Point search (point-in-rectangle search, point-in-circle search, point-in-polygon search)
h. Traverse calculations (application of cross multiplication to find perimeter and area)
i. Line simplification
j. Interface development to download survey data from electronic data logger or total station.
k. Hong Kong Map Enquiry System

Content Distribution

A	B	C	D	E
15%	25%	15%	25%	20%

PART B - Teacher specific information

Teaching and Learning Methods

A combination of lectures, demonstrations, tutorials and hands-on exercises will be used. Real cases from surveying and mapping will be used throughout the delivery of lectures and tutorials. Substantial use of surveying and digital map data is expected in all hands-on exercises.

Assessment Methods

Continuous assessment consists of three components: Phase Tests, Group Project and Hands-on Examination. Two phase tests will be given to assess students' understanding of basic computer programming fundamentals and logic independently. A group project is designed to simulate the programming project environment allowing students to build up the team spirit and communications among group members. A hands-on programming examination will test students' independent mastering of programming techniques and problem solving skills.

Phase Tests	
#1	15%
#2	25%
Group Project	20%
Examination (Hands-on)	40%

Reading List

Textbook:

1. Deitel & Deitel and T.R. Nieto (2002). Visual Basic .NET How to Program. 2nd edition, Prentice Hall. QA76.73.B3 D462 2002

Recommended:

1. Christopher M. Frenz (2002). Visual Basic and Visual Basic .NET for Scientists and Engineers, Apress. QA76.73.B3 F755 2002
2. Gefen, D. and C. Govindarajulu (2004). Advanced Visual Basic .NET: Programming Web and desktop applications in ADO.NET and ASP.NET, Pearson Prentice Hall. QA76.73.B3 G44 2004

Supplementary:

1. Roe, G.R. (1999). Using Visual Basic with AutoCAD, Autodesk Press. T385.R587 1999
2. Martin T. and D. Selly (2002). Visual Basic .NET at work, Wiley. QA76.73.B3 M377 2002
3. Sean Campbell et al. (2003). 101 Microsoft Visual Basic .NET Applications, Microsoft Press. QA76.73.B3 A18 2003

Subject Code	LSGI4344	**Geospatial Data Mining & Knowledge Discovery**	
Credit	3	Syllabus designer(s)	W.Z. Shi, H. Baki Iz
Level	4	Pre-requisites	Nil
Weight	0.4	Assessment Method	Continuous assessment: Tests and quizzes 50%, Assignments 50%
Contact Hour	Lect/Tut : 42		

PART A – Subject specific information

Aims

The aim of this subject is to develop students' understanding on what geospatial data mining and knowledge discovery are. Students will learn the techniques of spatial data mining including statistical, fuzzy set-based, and AI-based solutions. It is also expected that students can critically review data mining and knowledge discovery problems through case studies. Critical and creative thinking will be promoted through lectures and in-class discussions.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Explain the purpose of spatial data mining (L3)
- Describe a range of data mining techniques and their use in analyzing geomatics data (L2)
- Identify and select the appropriate techniques for data mining geomatics data (L3)
- Analyze and the data to construct models (L3)
- Test models through validation and able to criticize their reliability (L4)

Keyword Syllabus

A. **Overview of spatial data mining and knowledge discovery**
Background of data mining and spatial data mining, Related concepts(such as spatial granularity, scale, uncertainty), spatial knowledge to be discovered (Spatial characteristics rules, Spatial classification rules, Spatial clustering rules, Spatial association rules, Spatial depending rules, and Spatial serial rules).

B. **Theoretical backgrounds for spatial data mining**
Dempster-Shafer theory, fuzzy sets, geo-spatial rough sets, uncertainty-related theories, rule induction.

C. **Statistical and fuzzy techniques for spatial data mining**
Spatial clustering, spatial classification, exploratory spatial data analysis, spatial pattern detection, approximation and aggregation, time series analysis, spatial prediction and trend analysis.

D. **Artificial intelligence techniques for spatial data mining**
Machine learning, neural network, expert system, decision tree, fuzzy reasoning.

E. **Other techniques for spatial data mining**
Spatial data warehouse, online spatial data mining, visualization for spatial data mining

F. **Discovery of knowledge from spatial data: case analysis**
Image data, vector data, temporal data

Content Distribution

A	B	C	D	E	F
15%	15%	25%	25%	10%	10%

PART B - Teacher specific information

Teaching and Learning Methods

Lectures are followed by student centered learning through reading, case assignments, and group projects to reinforce theoretical concepts and to develop skills in geospatial data mining.

Teaching and learning method is HPBL (Hybrid problem based learning). Students are briefly lectured about the data mining methods and provided with a number of sample solutions for various complex problems. Students' understanding will be reinforced through case studies where different solutions will be critically discussed.

Assessment Methods

In class lectures introduces the students to the fundamental ideas and relevant methods. Multiple choice quizzes are designed to monitor student learning at knowledge level.

In-depth learning takes place through the reading assignments to reinforce the lectures and monitored through phase tests with open ended questions.

Assignments and in class discussions are to used to assess students critical thinking

Reading List

1. Miller, H.J. and Han, J, 2001. *Geographic Data Mining & Knowledge Discovery***,** CRC Press (Taylor & Francis Group).
2. Berry, M., J., A., & Linoff, G., S., (2000). *Mastering data mining*. New York: Wiley.
3. Edelstein, H., A. (1999). *Introduction to data mining and knowledge discovery (3rd ed)*. Potomac, MD: Two Crows Corp.
4. Fayyad, U. M., Piatetsky-Shapiro, G., Smyth, P., & Uthurusamy, R. (1996). *Advances in knowledge discovery & data mining*. Cambridge, MA: MIT Press.
5. Han, J., Kamber, M. (2000). *Data mining: Concepts and Techniques*. New York: Morgan-Kaufman.
6. Hastie, T., Tibshirani, R., & Friedman, J. H. (2001). *The elements of statistical learning : Data mining, inference, and prediction*. New York: Springer.
7. Pregibon, D. (1997). *Data Mining*. Statistical Computing and Graphics, 7, 8.
8. Weiss, S. M., & Indurkhya, N. (1997). *Predictive data mining: A practical guide*. New York: Morgan-Kaufman.
9. Westphal, C., Blaxton, T. (1998). *Data mining solutions*. New York: Wiley.
10. Witten, I. H., & Frank, E. *Data mining*. New York: Morgan-Kaufmann

Subject Code	LSGI3243	**Geospatial Database and Data Infrastructure**	
Credit	3	Syllabus designer(s)	W.Z. Shi
Level	3	Pre-requisites	LSGI2222 Fundamentals of GIS
Weight	0.3	Assessment Method	Continuous assessment: 100%
Contact Hour	Lect/Tut : 28 PW : 28		

PART A – Subject specific information

Aims

The aim of this subject is to develop students' understanding on what a geospatial database and spatial data infrastructure are, the inherent data models, database management systems, and approaches to geospatial database design, the components and applications of spatial data infrastructure. It is also expected that students can critically review database design problems through a mini project. Through the learning process, students will foster better communication, particularly the preparation of technical report, and the global view of spatial data infrastructure.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Explain the concepts of geospatial database, data models and DBMS (L3)
- Implement and use a relational database in SQL (L3)
- Develop and to design a geospatial database (L4)
- Critically analyze the problems in database design (L3)

Keyword Syllabus

A. Relational Database Management Systems
Introduction to Database Management Systems; Relational data model, Relational algebra, Integrity; Structured Query Language (SQL);

B. Spatial Data Model and Schema
Object relational database; Spatial relationships;

C. Spatial Database Design
Normalisation; Conceptual design; Logical design; Introduction to physical design;

D. Spatial Database management
Introduction to database optimisation and Spatial Access Methods; Transactions; Centralised and distributed database;

Content Distribution

A	B	C	D
35%	25%	30%	10%

PART B - Teacher specific information

Teaching and Learning Methods

Lectures will introduce the subject materials on relational database, spatial database and database design concepts. Practical sessions will focus on hands-on experiences using Access (SQL queries), Visual Basic (connection to a database server and development of a user interface) and PostGIS (spatial database) to strengthen students' practical and technical skills. Individual project is designed to encourage students to acquire in-depth understanding of the development of a database application. The project should also help students to develop their creative and critical thinking as they have to design and set up their own application.

Assessment Methods

Continuous assessment: 100%

Continuous assessment consists of three components: two phase tests and one individual project. The first phase test assesses students' understanding of database systems and their abilities to manipulate data in a relational model. Second phase test assesses students' ability to query a database containing spatial information and their faculty to model an enterprise conceptually and to translate it in a relational model. Finally, students have to show their mastery of the subject in an individual project where they have to study a scenario, design and implement a software application modelling this scenario. The application is composed of a database system and a user interface.

Test 1	RDBMS and SQL	35%
Test 2	Spatial queries, DB design	30%
Individual project	SDB design and implementation	35%

Reading List

Recommended:

1. C. J. Date, "*An Introduction to Database Systems*" (8th ed.), Addison-Wesley, 2004, PolyU call number QA76.9.D3 D37 2004
2. P. Rigaux, M. Scholl, A. Voisard, "*Spatial Databases with application to GIS*", Morgan Kaufmann, 2002, PolyU call number G70.212.R54 2002.
3. S. Shekhar and S. Chawla, "*Spatial Databases, a Tour"*, Prentice Hall, 2003, PolyU call number G70.212.S54 2003.
4. M. F. Worboys and M. Duckham, "*GIS, a Computer Perspective*", Second edition, CRC Press, 2004, PolyU call number G70.2.W66 2004.
5. M. F. Worboys and M. Duckham, "*GIS, a Computer Perspective*", online resources available at http://worboys.duckham.org

Supplementary:

1. A. K. W. Yeung and G. B. Hall, "*Spatial Database Systems – Design, Implementation and Project Management*", Springer, 2007, PolyU call number G70.212.Y38 2007eb (electronic resource)

Subject Code	LSGI4213	**GIS in Business and E-commerce**	
Credit	3	Syllabus designer(s)	Lilian Pun
Level	4	Pre-requisites	(1) LSGI2222 Fundamentals of GIS; (2) LSGI326 Cartography
Weight	0.4	Assessment Method	Continuous assessment: 100%
Contact Hour	Lect/Tut : 28 PW : 28		

PART A – Subject specific information

Aims

This subject aims at introducing the impact of locational information on business / e-commerce activities. Students' GIS knowledge and skills are also reinforced through a specific application related to business. Individual and group discussions, and project reports will foster students' English communication and critical thinking. Mini group project will also facilitate creative and critical thinking, as well as to develop cooperative attitudes and behaviour of working with others.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Grasp a general understanding of geographical / locational implications on business (L1)
- Apply previously learnt GIS and web-mapping techniques to provide useful spatial information for assisting certain business decision makings, such as supply chain management, store locations, market and labour relationship (L3)
- Plan how a business can be conducted more economically and profitably in time and space (L3)
- Analyse dynamic spatial pattern and map noteworthy summarized results (L3); and
- Implement the above knowledge and skills with a small case- study (L3)

Keyword Syllabus

A. Marketing logistics: market place and customer relationships, supply chain management, time-based competition

B. Retailing: retail locations and distribution channels, spatial retail growth, geography and e-commerce, territory planning, site selection, spatial interaction models, network representation planning

C. GIS and business information strategies:
Application capabilities, operational, tactical and strategic applications

D. Aspects of GIS for managing business information, e.g. sales, customers, inventory, demographic profiles, mailing lists, service boundary, sales territory, delivery route

E. GIS for market analysis: retail outlets mapping, marketing and distribution, market segmentation, route analysis and store location.

Content Distribution

A	B	C	D	E
20%	20%	20%	20%	20%

PART B - Teacher specific information

Teaching and Learning Methods

Teaching and learning will largely be conducted through an on-line delivery platform. The subject materials, work examples, useful web sites and required readings will be uploaded to the on-line platform for students' easy reference. The contact hours will be used for lecturing the theory and concepts, individual and group discussions. In addition, a time table for discussion on specific topics will be scheduled and a quiz will be used as formative assessment in order to help students to further identify their strengths and weaknesses.

Students' knowledge and practical skills will be developed through a guided mini group project with presenting the results both verbally and in a written report. After finishing these exercises, students will be able to confidently apply their GIS skills and knowledge in business-related decision makings.

Assessment Methods

- Students' knowledge and skills in applying the GIS technology will be continuously assessed with the "real-time performance" approach in class discussions;
- a quiz testing the basic concepts; and
- a group project to be presented at the end of the term to assess their critical analysis and presentation skills.

Reading List

1. Birkin, M., Clarke, G. & Clarke, M. (2002) *Retail Geography and Intelligent Network Planning*, John Wiley & Sons, Ltd.
2. Burns, L.D. & Bryant, N.O. (2002). *The business of Fashion: Designing, Manufacturing, & Marketing*. 2nd e. Fairchild Publications, Inc.
3. Christopher, M. (2003). *Marketing Logistics*. Oxford, Butterworth-Heineman.
4. Bruce, M., Moore, C. & Birtwistle, G.(eds) *International Retail Marketing: A case study approach*, Butterworth-Heineman
5. Grimshaw, D.J. (1994) *Bringing Geographical Information Systems into Business*, Longman Scientific & Technical.
6. Fotheringham, A.S., Brunsdon, C. & Charlton, M. (2002) *Geographically Weighted Regression, the analysis of spatially varying relationships*, U.K.: John Wiley & Sons.

Subject Code	LSGI3251	**GIS Project**	
Credit	2	Syllabus designer(s)	Lilian Pun
Level	3	Pre-requisites	LSGI2222 Fundamentals of GIS
Weight	0.3	Assessment Method	Continuous assessment: 100%
Contact Hour	PW : 56		

PART A – Subject specific information

Aims

This subject aims at allowing students to reinforce their GIS knowledge by developing and demonstrating the ability to locate information on a chosen topic, investigating the area of interest by a practical application as well as to analyse, present and communicate geo-information clearly. Group discussions, proposal writing and project report writing will foster students' English communication. The project will also facilitate creative and critical thinking, as well as to develop cooperative attitudes and behaviour of working with others.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Describe what project requires the GIS technology (L1 & L2)
- Plan carefully and systematically how a GIS project is conducted (L3)
- Assess achievements versus limitations (L3)
- Integrate previously learnt GIS, mapping, computer programming and remote sensing knowledge and techniques in the project (L4)
- Design and develop a GIS application based on a GIS software or a spatial DBMS, and
- Confidently present and report findings from a project (L3 & L4)

Keyword Syllabus

A. Introduction to GIS Project Management
Reviews the concepts, methodologies, and tools for project management.

B. Proposal Preparation & Program Design
Objectives, Content Description, Assess achievements and limitations, Workflow, Schedule, Documentation, Flowchart, Database Design and Interface Design

C. Project Implementation
The students in small groups will carry out the projects according to instructions and guidance, while inputting their own ideas of setting up databases, collecting data, converting data, and finishing the task as much as feasible.

D. Project Evaluation and Reporting
The students will evaluate the project, prepare brief reports on their projects, and present them in class.

Content Distribution

A	B	C	D
10%	20%	50%	20%

PART B - Teacher specific information

Teaching and Learning Methods

This is a practical course supplemented with briefing sessions, tutorials, presentations, and group discussions. The students will be given a project task with broad guidelines to follow. The subject involves a good mix of disciplines, and they will be asked to write proposals, conduct designs, and eventually implement and report them.

Teaching and learning will largely be conducted through an on-line delivery platform. The subject materials, work examples, useful web sites and required readings will be uploaded to the on-line platform for students' easy reference. The contact hours will be used for lecturing the theory and concepts, and to a large extent for group discussions and laboratory work.

Students' knowledge and practical skills will be assessed from their performance and continuity in the project. Participation and enthusiasm in discussions, presentation and report writings will all be assessed. After finishing these exercises, students will be well-prepared to plan and start any GIS project, and in particular the specific GIS application subjects in Year 3.

Assessment Methods

Students' knowledge and skills will continuously be assessed with the "real-time performance" approach in class discussions, as well as a group project to be presented and submitted at the end of the term. The former aims at testing students' basic understanding of GIS concepts, techniques and methodology. The latter can assess students' ability in critical analysis (especially in comparison and integration of knowledge), team work and presentation skills.

Subject Code	LSGI4261	**GIS-based Demographic Analysis**	
Credit	3	Syllabus designer(s)	Lilian Pun
Level	4	Pre-requisites	(1) LSGI2222 Fundamentals of GIS; (2) LSGI326 Cartography
Weight	0.4	Assessment Method	Continuous assessment: 100%
Contact Hour	Lect/Tut : 28 PW : 28		

PART A – Subject specific information

Aims

This subject aims at introducing the impact of locational information on demography. Students' GIS knowledge and skills are also reinforced through a specific application related to demographic analysis.

Group discussions, project report writing and presentation will foster students' English communication. The mini group project will also facilitate creative and critical thinking, as well as to develop cooperative attitudes and behaviour of working with others.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Grasp a general understanding of demographic theories and its socio-economic implications (L1)
- Apply previously learnt GIS techniques to construct a population database with relevant socio-economic variables, analyse spatial pattern and present noteworthy summarized results (L3)
- Plan how a census can be conducted more effectively in time and space (L3)
- Implement the above knowledge and skills with a small case- study (L3)

Keyword Syllabus

A. Basic sources of demographic and socioeconomic data and ways of accessing them

B. Limitations of census and survey data

C. Population structure: size & distribution, age and sex, family groups, racial & ethnic composition etc.

D. Population change: fertility & mortality, immigration & emigration

E. Population estimates and projections

F. Geodemography: geographic area concepts and information systems for demographic applications

G. Use of GIS for accessing, analyzing and forecasting demographic data – "Population information system":
Spatial analysis, areal interpolation, hierarchy of spatial units, dynamic regionalization and so on.

Content Distribution

A	B	C	D	E	F	G
10%	5%	10%	15%	10%	20%	30%

PART B - Teacher specific information

Teaching and Learning Methods

Teaching and learning will largely be conducted through an on-line delivery platform. The subject materials, work examples, useful web sites and required readings will be uploaded to the on-line platform for students' easy reference. The contact hours will be used for lecturing the theory and concepts, individual and group discussions. In addition, a time table for discussion on specific topics will be scheduled and a quiz will be used as formative assessment in order to help students to further identify their strengths and weaknesses.

Students' knowledge and practical skills will be developed through a guided mini group project with presenting the results both verbally and in a written report. After finishing these exercises, students will be able to confidently apply their GIS skills and knowledge in the field of demography.

Assessment Methods

- Students' knowledge and skills in applying the GIS technology will be continuously assessed with the "real-time performance" approach in class discussions;
- a quiz testing the basic concepts; and
- a group project to be presented at the end of the term to assess their critical analysis and presentation skills.

Reading List

1. Siegel, J.S. (2002) *Applied demography: applications to business, government, law and public policy*, San Deigo, California: Academic Press.
2. Siegel, J.S. & Swanson, D.A. (eds) (2004) *The methods and materials of demography*, San Diego, California: Elsevier Academic Press.
3. Some more GIS references later.

Subject Code	LSGI4391	**Individual Project**	
Credit	6	Syllabus designer(s)	Conrad Tang
Level	4	Pre-requisites	All year 1 subjects
Weight	0.4	Assessment Method	Continuous assessment: 100%
Contact Hour	PW : 168		

PART A – Subject specific information

Aims

The main objective of the dissertation is to help students to integrate knowledge gained throughout the course, to achieve a higher order learning process and to apply this to solve professional problems. This subject also promotes self awareness and critical thinking through regular discussions between the student and their supervisor. Team work organization may also be required where, for example, in taking field measurements, the student needs to solicit help and assistance from his peers.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to demonstrate:

- The application of knowledge gained through the degree programme (L4)
- Advanced research skills in investigating an area of particular interest (L4)
- Organisational skills in carrying the project through (L4)
- The mastery of selected equipment (L4)
- Their analytical skills in deriving sound and well argued conclusions (L4)
- Their skills in report design and presentation (L4)

Keyword Syllabus

A. Proposal
Each student chooses a broad field of investigation in the beginning first semester of Year 3, and presents a brief dissertation proposal. Assistance will be given to students in establishing their subject areas, including topics suggested by industry.

B. Progress Report
The break between the first and the second semester is then a period for developing the methodology and carrying out a literature research. A proposed methodology on the assigned title will be submitted at the beginning of the second semester, including timetable of likely activities. Each student will be supervised by a fulltime member of staff who, through weekly or more frequent meetings with the student, provides guidance and critical discussion of the work.

C. Presentation
Towards the end of the semester students will present a summary of their dissertation topic and defend the results and conclusions during a Q & A session.

D. Final Report
By the end of the second semester students must submit a bound copy of their dissertation.

Content Distribution

A	B	C	D
10%	20%	30%	40%

PART B - Teacher specific information

Students are to work individually on a topic of the student's choice in land surveying, geo-informatics or utility management as approved by the subject coordinator and the project supervisor. Progress reports are immediately assessed and graded by the supervisor. Final assessment of the dissertation document and the oral presentation will be carried out by two internal assessors, where one of whom is the supervisor and the other is the moderator.

Reading list

1. Walliman, N.S.R. (2004). *Your undergraduate dissertation : the essential guide for success,* SAGE.
2. Bryant, M.T. (2004). *The portable dissertation advisor*, Corwin Press.
3. Pao Yue-kong Library
4 LSGI's Teaching and Learning web site

Subject Code	LSGI4292	**Internet and Mobile GIS**	
Credit	3	Syllabus designer(s)	Geoffrey Shea
Level	4	Pre-requisites	(1) LSGI2222 Fundamentals of GIS; (2) LSGI326 Cartography
Weight	0.4	Assessment Method	Continuous assessment: 100%
Contact Hour	Lect/Tut : 21 PW : 42		

PART A – Subject specific information

Aims

This subject focuses on the development of pocket PC-based applications. The subject allows students gain first-hand experience in apply mobile computing technology to the task of GIS applications. Class discussions and group projects will promote English communication and cooperative attitudes and behaviour of working with others.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Develop systems with XML and WML (L2)
- Confidently carry out Internet programming (L3)
- Confidently implement pocket PC applications (L3, L4)

Keyword Syllabus

A. Concepts and protocols of Internet

B. 3-tier client/server Internet computing architecture

C. Internet and mobile GIS technologies
   a. Extensible Markup Language (XML)
   b. Geography Markup Language (GML)
   c. Scalable Vector Graphics (SVG)
   d. Wireless Markup Language (WML)

D. Internet programming
   a. Web authoring and scripting environment
   b. Web database programming
   c. Online spatial editing/updating
   d. Pocket PC database applications
   e. Wireless Application Protocol (WAP) programming
   f. Mobile device programming on Windows CE

E. Introduction to Web Services

Content Distribution

A	B	C	D	E
5%	5%	35%	50%	5%

PART B - Teacher specific information

Teaching and Learning Methods

A combination of lectures, demonstrations, tutorials and hands-on exercises will be used. Students are expected to gain more hands-on experience through formal practical sessions and completion of group project. Assignments are designed to reinforce in class lectures. Group project is designed to develop students' knowledge and skills in 3 aspects: (1) Problem solving techniques and critical evaluation; (2) Integration of different technologies acquired in class lectures; and (3) Team work and group presentation.

Assessment Methods

The understanding of the theories, techniques and methodology will be examined through phase tests and assignments. The mastery of skills and techniques will be examined by practical sessions and assignments. The critical analysis, confident application of skills, design of projects, and team member's contribution are examined by a group project.

Phase Tests	
#1	20%
#2	25%
Assignments	20%
Group Project	35%

Reading List

Supplementary:

1. Ellen Pearlman (2003). SVG for Web Developers, Prentice Hall.
2. Yao, P. (2004). .NET compact framework programming with Visual Basic .NET, Addison-Wesley.
3. Eaglestone, B. (2001). Web database systems, McGraw-Hill.
4. Buyens, J. (2002). Web database development step by step .NET edition, Microsoft Press.
5. Fraser, S. and S. Livingstone (2002). Beginning VB.NET XML: Essential XML skills for VB.NET programmers, Wrox.
6. Wyke, R.A. et al. (2002). XML Programming, Microsoft Press.
7. Forsberg, C. and A. Sjostrom (2002). Pocket PC development in the enterprise: mobile solutions with Visual Basic and .NET, Addison-Wesley.
8. Grattan, N. (2002). Pocket PC, Handheld PC developer's guide with Microsoft eMbedded Visual Basic, Prentice Hall.
9. Tiffany, R. (2003). SQL Server CE database development with the .NET compact framework, Apress.
10. Watt, A. et al. (2003). SVG unleashed, SAMS.
11. Makofsky, S. (2004). Pocket PC network programming, Addison-Wesley.

Subject Code	LSGI2351	**Introduction to Utility Surveying and Management**	
Credit	2	Syllabus designer	Y Q Chen
Level	2	Pre-requisites	Nil
Weight	0.2	Assessment Method	Continuous assessment: 100 %
Contact Hour	Lect/Tut : 28		

PART A – Subject specific information

Aims

This is an introductory subject for all the students enrolled in the programme. The aims of the subject are:

- Providing an understanding of the fundamental knowledge and techniques and skills of utility surveying and management
- Enabling students to understand clearly the relationship between the subject knowledge and other subjects, and between geomatics discipline and other engineering and management disciplines

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass should be able to:

- Describe the functions and construction and characteristics of subsurface utility of various kinds (L2)
- Describe the principles of various utility detection and monitoring techniques (L2)
- Select different techniques based on the task requirements (L3)
- Describe the utility information management systems and their components (L2)
- Position utility surveying and management among broad disciplines (L2)

Keyword Syllabus

A. Subsurface Utilities
Types of subsurface utilities; construction and attributes of each type of utility; mapping of subsurface utilities and its importance

B. Techniques for Utility Surveying
Electromagnetic detection (active and passive systems); Ground Probing Radar (GPR); interpretations of GPR images; sonar techniques for underwater utilities; utility health monitoring; stepped approach for different levels of tasks

C. Utility Management
Database for subsurface utilities; utility information systems; utility operation and maintenance

D. Utility Surveying and Management (USM) Profession
Academic and professional position of USM; knowledge structure for a USM profession; Hong Kong and China utility surveying associations; international perspective of USM

Content Distribution

A	B	C	D
25%	30%	30%	15%

PART B - Teacher specific information

Teaching and Learning Methods

Since this is an introductory subject, contact hours are mainly used to deliver the contents. Site visits will be organized for students to gain practical appreciation and examples of utility surveying and management. Professionals will also be invited to give guest lecturers so that students can have a close link with industry and professional body.

Assessment Methods

Students' understanding on different expected learning outcomes will be assessed continuously by quizzes, phase tests and an end-of-year test. Proper proportion of questions at different difficulty levels will be set to evaluate students' achievement in different outcome objectives.

Subject Code	LSGI228	**Mapping**	
Credit	3	Syllabus designer(s)	Janet Nichol
Level	2	Pre-requisites	Nil
Weight	0.2	Assessment Method	Examination: 50% Continuous assessment: 50%
Contact Hour	Lect/Tut : 28 PW : 28		

PART A – Subject-specific information

Aims

The aims of this subject are:

- To give students a basic knowledge of maps and the processes in their production, design and interpretation.
- Familiarize students with both the qualitative and quantitative aspects of map production including the conventional rules and guidelines for selecting particular features
- Familiarise students with symbols and geometrical properties to be utilized in different map types.

The subject will promote life-long learning with 'hands on' learning approach , task-based problem solving ability, and to develop students ability to work with others.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will:

- Be familiar with all elements of maps (L1)
- Understand aspects of map production and presentation (L2)
- Possess the practical skills to use and interpret a topographic map. (L2)
- Possess the practical skills to produce and work with digital maps (L2)
- Have the basic knowledge of Hong Kong maps to provide the foundation for future projects using both hardcopy and digital maps (L2)

Keyword Syllabus

A. Map concepts
The reduction of the real world to the symbolic, history of maps, remote sensing inputs to maps, including air photos and air photo interpretation, classification of maps, scale, grid, direction.

B. Hong Kong map systems
Topographic series (1:1000, 1:5000, 1:20000, 1:50000 & 1:100000), countryside series, geological series, map indexing system.

C. The concept of map scale
The problem of scale, influence of scale on map detail, generalisation

D. Map symbol systems and symbol perception
Principles, conventions, design considerations, map text, map layout, conventional symbols in Hong Kong topographic maps

E. Representation of relief, natural and cultural features

Spot height, contour, hypsometric colouring, hill shading, hydrographic features, vegetation, boundary, built-up areas, transportation.

F. Map projections

The Earth's geometry, planar and spherical coordinates, transformations, properties of projections and applications, examples from cylindrical, conical and azimuthal groups, UTM grid, Hong Kong Grid, transformation between different coordinate systems.

Content Distribution

A	B	C	D	E	F
30%	10%	10%	15%	15%	20%

PART B - Teacher specific information

Teaching and Learning Methods

Teaching and learning materials will be placed on-line for students to download easily. Contact hours will be used for formal lectures, and practical work. Group projects will form a part of the practical work and this will introduce students to a problem-solving approach. Thereby, students will be encouraged to use initiative and explore a wide range of solutions. Channels for on-line discussion will be created whereby concepts and issues can be addressed informally, outside the classroom situation.

Assessment Methods

Continuous assessment consists of two components, phase test and practical work. A phase test will be given to assess students' basic understanding of map design and inerpretation independently. Practical work will be used to assess students' appreciation of the cartographic practice and skills gained during the course. A written examination will test students' independent skills of expression, as well as knowledge of map production and interpretation, and traditional mapping concepts.

Reading List

Textbooks:

1. Robinson, A. & et al. (1995). *Elements of Cartography*. 6th ed., John Wiley & Sons, Inc.
2. Keates, J.S. (1989) . *Cartographic Design and Production*. 2nd ed., Longman Scientific & Technical.

Recommended:

1. Maling, D.H. (1993). *Coordinate Systems and Map Projections*. 2nd ed., Pergamon Press.

Subject Code	LSGI3332	**Photogrammetry I**	
Credit	2	Syllabus designer(s)	Bruce King
Level	3	Pre-requisites	LSGI2341 Survey Adjustment
Weight	0.3	Assessment Method	Examination: 50% Continuous assessment: 50%
Contact Hour	Lect/Tut : 21 PW : 14		

PART A – Subject specific information

Aims

This subject introduces the technology of photogrammetry to students. It's purpose is to provide an awareness of the technology as a viable alternative to traditional surveying and to allow students gain first-hand experience in applying aerial photogrammetry to the task of topographic mapping. This subject also aims to develop students the ability in preparing technical reports and presenting the information in a way understandable to non-experts.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass should be able to:

- Explain the role that aerial photogrammetry plays in the Geomatics profession (L3)
- Demonstrate that photogrammetry is a part of the greater discipline of Geomatics by giving examples of how photogrammetric principles are similar to those of surveying (L2)
- Use a stereoscope and parallax bar to measure and compute the heights of objects in a stereopair (L2)
- Discuss the advantages and disadvantages of alternative mathematical models used in the photogrammetric processes applied in aerial photogrammetry and make correct choices when having to choose between them (L3)
- Apply the principles of photogrammetry to produce an accurate topographic map from a stereopair of aerial photographs using photogrammetric software (L2)
- Compare different photogrammetric products and make correct choices in their application to various projects (L3)

Keyword Syllabus

A. The concept of photogrammetry
The photograph as a perspective projection
The ideas of collinearity and coplanarity
Types and uses of photogrammetry – aerial and terrestrial, metric and non-metric

B. The processes of photogrammetry
Creating a 3D representation of real objects from 2D perspective projections
Interior orientation. Conformal, affine and projective transformations.
Exterior orientation. Relative and absolute orientation, block/bundle adjustment.
Camera calibration

C. Stereoscopic viewing
Parallax
Height from parallax
Stereoscopes and parallax bar
Epipolar geometry

D. Aerial photogrammetry

Strips and blocks of photographs, endlap, sidelap
Scale
Relief displacement
Products derived from aerial photographs

E. Topographic Mapping from aerial photographs

Stereoplotters – analytical and digital
Space intersection
3D digitising

Content Distribution

A	B	C	D	E
10%	30%	10%	20%	30%

PART B - Teacher specific information

Teaching and Learning Methods

Teaching and learning methods used in this subject will include:

- Didactic lectures. To provide a basis of information on which students can readily draw when undertaking tutorial and practical work.
- Tutorials. Student centred classes where the focus is on resolving issues related to the students comprehension of the lecture material.
- Group practical work. To reinforce the theoretical concepts and to develop skills in analysing presenting information of a technical nature.
- Individual extended assignments. Provide an opportunity for students to develop a self-motivated deeper understanding of particular concepts associated with this subject. It's use will also develop skills in researching and writing articles of a technical nature not originating form empirical or laboratory studies.

Assessment Methods

A two-pronged assessment will be used - continuous assessment and examination.

- Continuous assessment components – extended assignments and practical reports will enable students to demonstrate their analytical and technical abilities in communicating specialist knowledge. The practical reports themselves will require students to explain what was done and why various decisions or choices were made, thus providing an indication of how well they comprehend the fundamental principles involved.
- Examination will be used to independently check that each student has taken responsibility for their own learning of the essential concepts. It also provides, through careful examination questions, a means to ensure the correct use of terminology and in-depth understanding of interrelated concepts.

Reading List

Textbook:

1. Wolf, P.R. and B.A. Dewitt (2000). *Elements of photogrammetry with applications in GIS*. 3rd edition, McGraw-Hill. TR693 .W64 2000

Recommended:

1. Falkner, E. and D. Morgan (2002). *Aerial mapping: methods and applications*. Lewis Publishers, Boca Raton. TA593.F34 2002.
2. Kraus, K. (1993). *Photogrammetry volume 1: fundamentals and standard processes*. Ferd. Dümmler Verlag, Bonn. TR693.K6213 1993
3. Kraus, K. (1997). *Photogrammetry volume 2: advanced methods and applications*. Ferd. Dümmler Verlag, Bonn. TR693.K6213 1993
4. McGlone, J.C. (ed) (2004). *Manual of Photogrammetry*. 5th edn. American Society of Photogrammetry, Falls Church. TA593.A63 2004
5. Mikhail, E.M., J.S. Bethel and J.C. McGlone (2001). *Introduction to modern photogrammetry*. John Wiley & Sons, New York. TR693.M55 2001
6. Paine, D.P. and J.D. Kiser (2003). *Aerial photography and image interpretation*. 2nd edition, Jossey-Bass. TR810.P25 2003
7. Warner, W.S., R.W. Graham and R.E. Read (1996). *Small format aerial photography*. Whittles, Scotland. TR810.W37 1996

Supplementary:

1. Agfa (1996). *A guide to digital photography. Theory and basics*. Agfa-Gevaert, Belgium. TR267.G85 1996.
2. Ghosh, S.K. (1988). *Analytical photogrammetry*. Pergamon Press, New York. TR693.G55 1988.
3. Ghosh, S.K. (1968). *Theory of stereophotogrammetry*. Dept. of Geodetic Science, Ohio State University, Columbus. TR693.G56.
4. Hallert, B. (1960). *Photogrammetry, basic principles and general survey*. McGraw-Hill, New York. TR693.H313.
5. Moffitt, F.H., and E.M. Mikhail (1980). *Photogrammetry*. Harper & Row, New York. TA593.M58 1980.
6. Slama, C.C. (Ed.) (1980). *Manual of photogrammetry*. 4th edn. American Society of Photogrammetry, Falls Church. TA593.A63 1980
7. *Australian Journal of Geodesy, Photogrammetry and Surveying*. Institution of Surveyors, Australia, Canberra. QB301.A87.
8. *ITC Journal*. The International Institute for Aerial Survey and Earth Sciences, Enschede. TA593.I54.
9. *ISPRS Journal of Photogrammetry and Remote Sensing*. Elsevier, Amsterdam. TA593.P52.
10. *Photogrammetric Record*. Photogrammetric Society, London. TR693.P46
11. *Photogrammetric Engineering and Remote Sensing*. American Society of Photogrammetry, Falls Church. TA593.P54
12. ASP-ASCM Conventions }
13. ACSM-ASPRS Conventions } TA502.A472, TA593.A45

Subject Code	LSGI3321	**Remote Sensing**	
Credit	3	Syllabus designer(s)	Janet Nichol
Level	3	Pre-requisites	Nil
Weight	0.3	Assessment Method	Examination: 50% Continuous assessment: 50%
Contact Hour	Lect/Tut : 28 PW : 28		

PART A – Subject specific information

Aims

The aims of this subjects are:

- To give students a background to the current state of development of the remote sensing discipline including basic principles of imaging, image processing and data types and sources
- To develop students' skills in image processing
- To encourage students to examine ways of applying their knowledge and skills to actual environmental problems and situations

The subject will promote life-long learning with 'hands on' learning approach, task-based problem solving ability, and to develop students ability to work with others.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass should be able to:

- Be familiar with basic physical concepts of electro-magnetic energy (L1)
- Be familiar with the 'state of the art' in earth resource monitoring from satellite platforms (L2)
- Explain how computers handle image data, and the different data formats (L3)
- Possess the practical skills to process digital images (L2)
- Have the knowledge of remote sensing platforms and systems to make recommendations for project planning for environmental monitoring in Hong Kong (L3)

Keyword Syllabus

A. Introduction to remote sensing and physical principles of imaging

B. Spectral reflectance of earth surface features and spectral response patterns

C. Sensors and platforms: aircraft, satellites and scanning systems

D. Digital images and image display: grey scale, pseudocolour and multispectral images

E. Image restoration and pre-processing

F. Digital image processing: contrast enhancement, image arithmetic, image classification

G. Applications of remote sensing in the urban environment and in the natural environment

Content Distribution

A	B	C	D	E	F	G
15%	10%	10%	10%	10%	25%	20%

PART B - Teacher specific information

Teaching and Learning Methods

Teaching and learning materials will be delivered on-line for students to download easily. Contact hours will be used for formal lectures, hybrid problem-solving and practical work. Group projects will form a part of the practical work and these will require students to use initiative and explore a wide range of solutions.

Assessment Methods

Continuous assessment consists of two components, phase test and practical work. The phase test will assess students' basic understanding of physical concepts and the state of the art of the discipline, independently. Practical work will be used to reinforce, and assess students' understanding of the image processing practice and skills gained during the course. A written examination will test students' independent skills of expression, knowledge of the discipline, and the ability to apply procedures and concepts to an defined problem of environmental management in Hong Kong..

Reading List

Textbook:

1. Lillesand, T. and Keifer 2000, Remote Sensing and Image Interpretation, 5th ed.Wiley.
2. Mather, P. 1999, Computer processing of remotely sensed images, 2nd Edition, Wiley.

Recommended:

1. Campbell, J.B. (1996). Introduction to remote sensing. Guilford Press, New York. 1996.
2. Robinson A. H. et al., (1996) Elements of Cartography. 6th Edition, Wiley & Sons, New York.

Supplementary:

1. The International Journal of Remote Sensing, The Remote Sensing Society, UK.
2. ISPRS Journal of Photogrammetry and Remote Sensing. Elsevier, Amsterdam.
3. Photogrammetric Engineering and Remote Sensing**.** American Society of Photogrammetry, USA..

Subject Code	LSGI3244	**Spatial Analysis**	
Credit	3	Syllabus designer(s)	Zhilin Li
Level	3	Pre-requisites	LSGI2222 Fundamentals of GIS
Weight	0.3	Assessment Method	Continuous assessment: 100%
Contact Hour	Lect/Tut : 28 PW : 28		

PART A – Subject specific information

Aims

The aims of this subject are :

- To provide an understanding of the fundamental principles and techniques of spatial analysis;
- To enable students become proficient in the use of conventional and modern spatial analysis techniques;
- To enable students to properly apply spatial analysis techniques to practical problems.

English communication skills, team spirit and critical thinking attributes will be fostered in the teaching and learning process, through lab sessions, class discussions and group project.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass should be able to:

- Define various types of spatial analysis (L2)
- Explain the various types of spatial analysis techniques (L3)
- Interpret spatial analysis results (L3)
- Apply different spatial analysis techniques for a given set of data (L4)

Keyword Syllabus

A. Spatial analysis functions required in a GIS;
- Generalized concepts of space (Euclidean, social, perceptual, topological, scale, spectral, frequency);
- Generalized concept of spatial analysis (statistical spatial analysis, spatial modeling);
- Spatial analysis functions required in a GIS.

B. Nature of spatial data
- Characteristics (dynamics, fuzziness, inaccuracy, currency, spatial dependence, spatial heterogeneity, scale-dependence, etc.),
- Special treatment of spatial data

C. Geometric spatial data analysis
- Types of analysis: Point, linear pattern and area pattern
- Techniques for analysis:
  Measurement: complexity, trend, density, shape, distance,
  Spatial arrangement: point pattern, line pattern and area pattern; directionality, intercepts, connectivity, gravity

D. Statistical spatio-tempral data analysis

- Types of statistical spatio-temporal data analysis
  Sampling: (sampling objects from database and choice of adequate spatial scale of analysis);
  Manipulation: (Data verification to compare variables for the same area but for a different and incompatible set of zones);
  Exploratory spatial data analysis (trends, outliners, spatial pattern and association);
  Conformatory or explanatory analysis (systematic analysis, hypothesis testing).
- Techniques for Statistical spatial data analysis
  Regression, density estimation, kriging, trend analysis, clustering, time series

E. Relational spatial data analysis

- Types of relational analysis
  spatial correlation, proximity, direction
- Techniques for relational analysis
  Point-in-polygon, line-in-polygon; topological, directional and, order relational models, line-of-sight, viewshed, network accessibility.

F. Spatial analysis for decision making: Case analysis

Some examples in social-economic studies, ecology, and environmental and resource management.

Content Distribution

A	B	C	D	E	F
10%	10%	20%	25%	20%	15%

PART B - Teacher specific information

Teaching and Learning Methods

- Lectures to explain theories and methodology,
- Lab sessions and a small individual project to reinforce the theories and methodology introduced during the lectures, so as to enable students to gain deeper understanding of the principles and techniques, to acquire practical problem-solving skills, to become critical in thinking;
- A group project is designed to enhance the critical thinking, team spirit, problem solving skill, leadedship and presentation skill.

Assessment Methods

- The understanding of the theories, techniques and methodology will be examined through phase tests;
- The mastery of skills and techniques will be examined by lab sessions, individual project and assignments;
- The critical analysis, confident application of skills and design of projects are examined by a group project.

Reading List

1. Chou, Y.-H., 1997, *Exploring Spatial Analysis in Geographic Information Systems*. Onword Press. 474pp.
2. DeMers, M.N., *Fundamentals of Geographic Information Systems*. John Wiley & Sons, Inc. 486pp.

3. Fisher, M., Schlten, H. and Unwin, D., 1996. *Spatial analytical perspectives on GIS*. Taylor & Francis. 256pp.

4. Fotheringham, S. and Rogerson, P. (eds.), 1994. *Spatial analysis and GIS*. Taylor & Francis. 281pp.

5. Li., Z., Zhou, Q. and Kainz, W. (eds.), 2004. *Advances in Spatial Analysis and Decision Making*. A.A. Balkema Publisher. 321pp.

6. Longley, P. and Batty, M. (eds.), 1996. *Spatial analysis: modeling in a GIS environment*. GeoInformation International. 392pp.

Subject Code	LSGI2341	**Survey Adjustment**	
Credit	3	Syllabus designer(s)	H. Baki Iz
Level	2	Pre-requisites	AMA284 Mathematics / AMA211 Intro to Calculus and Linear Algebra
Weight	0.2	Assessment Method	Examination : 50% Continuous assessment: 50%
Contact Hour	Lect/Tut : 42		

PART A – Subject specific information

Aims

The aim of this subject is to introduce students the basic statistical concepts relevant to the analysis of observations and basic survey adjustment methods. Problem solving skills that contributes student's critical thinking skill will be fostered through hybrid problem based learning and portfolio assessment.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Explain the basic statistical concepts relevant to the analysis of observations (L2)
- Identify the error sources affecting survey measurements (L2)
- Differentiate appropriate adjustment models for different surveying techniques (L3)
- Use professional software to adjust survey observations (L2)
- Assess the quality of observations (L2 and L3))
- Plan and design survey networks (L3)

Keyword Syllabus

A. Probability and statistics
Random variables; relative frequency; measure of central tendency and dispersion; normal distribution, sampling distribution of the mean; confidence intervals; large sample test for the population mean, small sample test for the population mean; comparing the means of two populations; comparing small sample means.

B. Observation errors and their propagation
Types observation errors, variance and covariance; correlation; variance-covariance matrix; variance of a quantity derived from observations for linear, non-linear functions; covariance of two quantities derived from same set of observations; weight, weight matrix and weighted mean.

C. Adjustment of Observation Equations
Linear and non-linear observation equations; software applications.

D. Adjustment of Condition Equations
Linear and non-linear condition equations with examples.

E. Network Design
Zero order, first order and second order network designs.

Content Distribution

A	B	C	D	E
10%	35%	40%	10%	5%

PART B – Teacher specific information

Teaching and Learning Methods

Teaching and learning method is HPBL (Hybrid Problem Based Learning). Students are briefly lectured about the survey adjustment methods followed by appropriate sample solutions for various generic adjustment problems. Each week students are required to formulate, solve and produce reports that critically evaluate their survey adjustment solutions.

Assessment Methods

Assessing portfolios constructed through weekly assignments in which students are expected to identify and use appropriate methodologies, demonstrate the ability to use professional software critically, produce technical reports using correct English, and critically discuss their results (formative).

Portfolio assessment is also used to monitor students' development of critical thinking (summative).

Text

1. Uotila, U (1988) Analysis of Observations. Lecture Notes, The Ohio State University.

Professional Reference

1. Wolf, P.R. and C.D. Ghilani (1997). *Adjustment computations*. John Wiley and Sons, Inc., N.Y
2. Mikhail, E.M., and G. Gracie (1981). *Analysis and adjustment of survey measurements*. Van Nostrand Reinhold, NY.
3. Mikhail, E.M. (1976). *Observations and least squares*. University Press of America, N.Y.

Reading List

1. Graybill F.A. (1984).Theory and Application of the Linear Model, Duxbury Press.
2. Hamilton, W.C. (11964) Statistics in Physical Science, Ronald Press Pub Comp.

Subject Code	LSGI2372	**Surveying**	
Credit	3	Syllabus designer(s)	Esmond Mok
Level	2	Pre-requisites	Nil
Weight	0.2	Assessment Method	Continuous assessment: 100%
Contact Hour	Lect/Tut : 21 PW : 42		

PART A – Subject specific information

Aims

The aims of this subject are:

- To provide an understanding of the fundamental principles and techniques of land surveying.
- To enable students become proficient in the use of conventional and modern land surveying equipment
- To ensure the proper application of principles and methods when carrying out survey tasks.

Students' communication skill, leadership and cooperative attitudes of work with others will be developed through group field practicals.

Outcomes of professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Describe the functions and operation of modern survey equipment (L2)
- Explain sources of errors in survey measurements and apply proper field procedures to reduce or eliminate these errors (L3)
- Describe how a survey coordinate system is established and the conversion from one plane coordinate system to another (L2)
- Compare different control and positioning techniques and their booking methods (L3)
- Correctly apply the control and positioning techniques under different site conditions and specification requirements (L3)
- Confidently carry out the field scheme I project according to specification (L4)

Keyword Syllabus

A. Basic Concept
Geomatics, data collection concept, units of measurements, gradient, scale, direction and angle, orientation, geoid, ellipsoid, coordinate systems applied to mapping

B. Measurement Techniques
Taping, ordinary leveling, theodolite observation, trignometric heighting, reciprocal heighting

C. Point Positioning Techniques
Radiation, angular and length intersection, 2-point resection, 3-point resection

D. Control Survey
Horizontal and vertical control, site reconnaissance, triangulation, trilateration, triangulateration, traverse, eccentric station

E. Operation of Conventional and Modern Instrument
Mechanical theodolite and leveling instrument, total station, digital level, GPS

Content Distribution

A	B	C	D	E
10%	20%	25%	25%	20%

PART B - Teacher specific information

Teaching and Learning Methods

Teaching and learning will largely on-line delivery platform. The subject materials, video demonstrations, work examples, useful web sites and required readings will be uploaded to the on-line platform for students' easy reference. The contact hours will be used for discussions and in-class exercise to help students go through the self-reflection process. In addition, a time table for on-line forum discussion on specific topics will be scheduled and on-line quiz will be used as developmental assessment in order to help students to further identify their strengths and weaknesses. Students will also be encouraged to ask questions via emails.

Students' practical skills will be developed through a series of practical exercise. After finishing these exercise, students will be able to confidently carry out Field Scheme I project to be held in stage 1 summer. The concept of team work and team spirit will be promoted in field practical exercises.

Assessment Methods

Students' practical and equipment operation skills will be continuously assessed in field practical exercises, an integrated practical test, and an oral examination at the end of the term.

Students' understanding on different expected learning outcomes will be assessed continuously by quizzes, phase tests and an end-of-year test. Proper proportion of questions at different difficulty levels will be set to evaluate students' achievement in different outcome objectives.

Reading List

Textbook:

1. Schofield, W. (1993). *Engineering Surveying*. 5th ed., Butterworth-Heinemann Ltd.

Recommended:

1. Bannister, A. and S. Raymond (1992). *Surveying*. Longman House.

SUBJECT SYLLABI
(CO-HOST AND SERVICING DEPARTMENT SUBJECTS)

All subjects have no co-requisites and exclusions.

Subject Code	AMA284	**Mathematics**	
Credit	3	Syllabus designer(s)	Y H Choy
Level	2	Pre-requisites	Nil
Weight	0.2	Assessment Method	Examination: 60% Continuous Assessment: 40%
Contact Hour	Lect/Tut : 42		

PART A – Subject specific information

Aims and Outcomes

A. Professional/academic knowledge and skills

At the end of this subject students who gain a pass will be able to:

- Consolidate the basic principles and methods of mathematics relevant to the student's future study.
- Extend those areas of mathematics which are most important in connection with land surveying and geo-informatics.
- Understand and apply both analytical and numerical methods to solve their practical problems.
- Work on examples and apply basic mathematical techniques to solve the problems related to land surveying and geo-informatics.

B. Attributes for all-roundedness

- Communication and Language
- Attitudes and behaviour of working with others

Keyword Syllabus

A. Spherical Trigonometry: Spherical excess, standard formulae, Napier's rules, Applications of spherical trigonometry.

B. Vector, matrix algebra and linear systems: Difference between scalar and vector quantities, unit vectors and direction cosines, operations of vector algebra, dot product; cross product and their geometrical interpretations. Matrix algebra, systems of linear equation, Gauss elimination, partial pivoting, triangular decomposition, Choleski method, matrix partitioning, eigenvalues, eigenvectors, rotation of matrices, orthogonality.

C. Differentiation and Integration: Review of differentiation and integration of one variable. Taylor's theorem and related results. Concepts and techniques of partial differentiation. Unconstrained and constrained optimization.

PART B - Teacher specific information

Teaching and Learning Methods

Teaching and learning will be basically lectures and tutorials. The contact hours for lectures will be used to guide the students to understand the concepts of the mathematics studied. Teaching notes, exercises, solutions and hints to exercises, suggested reading will be uploaded to the website for easy reference. In order to consolidate their learning in-class assignment will be given frequently to monitor the students'

progress of learning. In addition, homework will be given to help the students to tackle the mathematical problems so that they can work through them at their own pace. Also in case of difficulties they are encouraged to discuss the problems with classmates and the subject lecturer concerned. In the tutorial class students will be asked to present their solved problem and then discussion will follow to let other classmates to comment on the appropriateness of the methods being used. Through interaction in discussions students will be able to communicate better among themselves and also the process will help the students to further identify their strengths and weaknesses. Students will also be encouraged to ask questions and communicate with the subject lecturer via emails.

Assessment method

Students' understanding on different expected learning outcomes will be assessed by a series of in-class assignments and homework. A mid-term test will be given and an end-of-year examination will be set according to the SOLO Taxonomy concept at the end of the term.

Reading List

1. G James (2002). *Modern Engineering Mathematics*, 3rd edition. Pearson Education.
2. Kreyzig (1999). *Advanced Engineering Mathematics*, 8th edition. John Wiley & Sons.
3. J. Clough-Smith (1987). *Introduction to Spherical Trigonometry*, 2nd edition. Hyperion Books.

SUBJECT DESCRIPTION FORM

Subject Title: Principles of Programming

Subject Code: COMP 201

Number of Credits: 3

Hours Assigned: Lecture 42 hours
Lab 14 hours

Pre-requisite: Nil

Co-requisite: Nil

Exclusion: Nil

Objectives:

- To provide students with knowledge on the fundamental elements in computer programming.
- To introduce advanced computer programming techniques necessary for developing more sophisticated computer application programs.

Student Learning Outcomes:

After taking this subject, the students should be able to:
Professional/academic knowledge and skills
(1) understand the programming elements for solving computing related problems;
(2) possess the ability to design and develop efficient computer programs for solving problems;
(3) possess the ability to learn advanced programming techniques independently;
(4) possess the ability to learn other high level programming languages independently;

Attributes for all-roundedness
(5) develop skills in problem solving using systematic approaches;
(6) identify and develop problem solutions in a logical manner;
(7) learn independently new technologies;
(8) solve complex problems in groups and develop group work.

Alignment of Programme Outcomes:

Programme Outcome 4: This subject contributes to developing critical thinking skills through lectures, in which students learn how to tackle simple problems; assignments and exercises in which they will practice their skills, and quizzes and examination questions in which their skills will be assessed.

Programme Outcome 5: This subject contributes to problem solving with programming skills through lectures which will teach the students the necessary technical skills involved, assignments and projects in which students will practice these skills, and quizzes and examination questions in which these skills will be assessed.

Programme Outcome 7: This subject contributes to team work with group-based projects for students to practice team spirit.

Syllabus:

Topic	Duration	
	Lecture	**Lab**
1. Fundamentals of Computing Basic concepts of computers and computing, compilation and interpretation, elementary programming constructs.	6	2
2. Flow controls Basic flow control: selection, repetition and functions.	12	4
3. Data Collections Structures, lists, sets and strings	9	3
4. Object-based programming Classes and instances, constructors and finalizers.	6	2
5. Program Design Problem solving, problem correctness, testing and debugging	9	3
Total	**42**	**14**

Course Structure:
This subject emphasizes both the conceptual elements in computer programming and practical experiences. The lectures will be taught in a workshop mode with hands-on exercises reinforcing taught concepts. Students are required to attend the laboratory sessions, which allows them to consolidate their concepts learnt in the lectures. Other practical work helps to reinforce the programming skills learned for applications.

Case Study: Nil

Method of Assessment:

Continuous Assessment 60%
Assignments, quizzes, tests and marked laboratory exercises.

Examination 40%

Note: Students must pass both the continuous assessment and examination sections to pass the course.

Method of Assessment for Learning Outcomes:

Assessment method / task	% weighting	Intended subject learning outcomes to be assessed (Please check as appropriate)							
		1	2	3	4	5	6	7	8
Assignments	60	x	x			x	x		
Project(s)		x	x			x	x		x
Quizzes		x	x	x	x	x	x	x	x
Examination	40	x	x	x	x	x	x	x	
Total	100								

Textbooks and Reference Material:

(1) John Zelle, Python Programming: An introduction to Computer Science, Franklin, Beedle & Associates, 2004
(2) C. Thomas Wu, An Introduction to Object-Oriented Programming with Java, McGraw-Hill, 3rd Edition Update, 2004.
(3) Deitel & Deitel, Java: How to Program, Prentice-Hall, 6th Edition, 2005.
(4) Deitel & Deitel, C++: How to Program, Prentice-Hall, 6th Edition, 2007.
(5) Patrick Winston, On to C++, Addison-Wesley, 1994

SUBJECT DESCRIPTION FORM

Subject Title: Data Structures and Algorithms **Subject Code:** COMP 305

Number of Credits: 3 **Hours Assigned:** Lecture 35 hours
Tutorial/Lab 21 hours

Pre-requisite: COMP 201 **Co-requisite:** Nil **Exclusion:** Nil

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Objectives:

- To provide knowledge in various data structures and algorithms.
- To introduce techniques for analyzing the efficiency of computer algorithms.

Student Learning Outcomes:

After taking this subject, the students should be able to:
Professional/academic knowledge and skills
(1) understand the properties of various data structures;
(2) identify the strengths and weaknesses of different data structures;
(3) design and employ appropriate data structures for solving computing problems;
(4) possess the knowledge of various existing algorithms;
(5) analyze and compare the efficiency of algorithms;
(6) possess the ability to design efficient algorithms for solving computing problems;
Attributes for all-roundedness
(1) solve problems independently;
(2) think critically for improvement in solutions.

Alignment of Programme Outcomes:

Programme Outcome 1: This subject contributes to communicative effectively by having students working in small teams to discuss and present programming in the lab and solving data structure design problems.
Programme Outcome 2: This subject contributes to the global outlook by having students understand the use of different computer platforms for different applications and their uses.
Programme Outcome 4: This subject contributes to critical thinking through tutorial and lab exercises as well as direct exchanges on novel uses of data structures and algorithms. They will also practice in written assignments, programming exercises, and potential projects.
Programme Outcome 5: This subject contributes to technical problem solving by initiating a wide variety of algorithm design and implementation skills through lab exercise and project with proper design and implementation.

Programme Outcome 7: This subject contributes to team work by employing a small group-based approach to lab problem solving, assignments and mini-projects.

Syllabus:

Topic	Duration of Lectures
1. Introduction Types of algorithms; analysis of algorithms; data structures; abstract data types.	2.5
2. Analysis of algorithms Mathematical techniques; classification of algorithms and their efficiencies; average-case and worst-case analysis.	2.5
3. Data structures: representation and algorithms Linear structures: linked-lists, stacks, queues; tree structures: binary trees, balanced trees, *m*-way trees, tree traversals; other common data structures: priority queues, heaps.	10
4. Sorting and searching algorithms Quadratic-time algorithms: bubble sort, insertion sort, selection sort; optimal-time algorithms: quick sort, merge sort, heap sort; searching algorithms: sequential search, binary search, tree search, dictionary and hashing.	10
5. Graph algorithms Depth-first and breadth-first search; test for acyclicity; topological sorting.	2.5
6. Text processing and data compression Prefix and suffix; dictionary; run-length encoding; Huffman coding.	5
7. Selected advanced topics Advanced topics such as AVL trees, divide-and-conquer.	2.5
Total	**35**

Laboratory Experiment: Use of different data structures

Case Study: Nil

Method of Assessment:

Continuous Assessment	60%
Examination	40%

Method of Assessment for Learning Outcomes:

Assessment method / task	% weighting	Intended subject learning outcomes to be assessed (Please check as appropriate)								
		1	2	3	4	5	6	7	8	9
Assignments	30		x	x	x	x				
Lab exercises			x	x	x	x				
Project										
Mid-term	30	x	x	x	x	x		x		
Examination	40	x	x	x	x	x				
Total	100									

Textbooks:

1. Frank M. Carrano, Data Abstraction & Problem Solving with C++: Walls & Mirrors, Addison Wesley, 2007.
2. Mark Allen Weiss, Data Structures and Algorithm Analysis in C, Second Edition, Addison Wesley, 1997.
3. Goodrich, M.T. and Tamassia, R., Data Structures and Algorithms in Java", Second Edition, John Wiley, 2001.

Reference Books:

1. Adam Drozdek, Data Structures and Algorithms in Java, Broooks/Cole, 2001.
2. Cormen, Leiserson and Rivest, Introduction to Algorithms, MIT Press, 1990.

SUBJECT DESCRIPTION FORM

Subject Title: Computing Professionals in Society **Subject Code:** COMP 452

Number of Credits: 3 **Hours Assigned:** Lecture/Seminar 42 hours

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Pre-requisite: Nil **Co-requisite:** Nil **Exclusion:** COMP 402,427

Objectives:

The general objective is to enable students to understand the social responsibilities of the computing professionals, because they hold a very powerful position in society. To be addressed in particular are professionalism and computer ethics. This means (i) identifying correctly the potential for an ethical problem in a particular context, the moral rules that might be compromised, and the cause of these issues; (ii) being aware of the responsibilities with respect to ethical issues in human activities affected by computers; (iii) deciding on courses of action and recommend changes to prevent recurrence of those events; and (iv) communicating well-informed opinions based on fact in a well-reasoned professionally competent way.

The second objective is to develop students' ability to analyze the fact and to communicate well in writing and orally because only well-informed opinions based on fact and presented in a well-reasoned professionally competent way are acceptable. This makes the writing intensive side of this course, which emphasizes clear written expression.

The third objective is to promote student participating in class discussion as well as taking quizzes and completing a number of written assignments, since opinions can be changed, and improved, through thoughtful discussion so that students are expected to come to class well-prepared.

Student Learning Outcomes:

After taking this subject, the students should be able to:
Professional/academic knowledge and skills
(1) be aware of the ethical issues surrounding computers;
(2) heighten their sensitivity to ethical issues in the use of computers and in the practice of the computer profession, so that they are more likely to see issues and respond appropriately;
(3) apply the conceptual tools provided in the course to develop analytical skills for determining what to do in ethical decision making or what the likely impacts the computer will have in this or that context; and
(4) work alone or in groups to arrive at ethical decisions.

Attributes for all-roundedness

(5) communicate effectively (both in Chinese and English) verbally at a level sufficient for project and system presentation, as well as general conversation ;
(6) communicate effectively in writing with technical documents and reports;
(7) learn independently for problem solving and solution seeking;
(8) collaborate with other team members for project design and development, while exhibiting leadership in a project team whenever designated or necessary;
(9) think and reason critically, especially on different issues related to computing professional in the society.

Alignment of Programme Outcomes:

Programme Outcome 1: This subject contributes to helping students' effective communication skills (writing and oral skills) through logical argument analysis assignment (individual) and scenarios analysis report and presentation (group project) in English.
Programme Outcome 3: This subject contributes to developing students' understanding and ability to evaluate ethical issues through an examination of ethical principles, the impact of such applied ethical issues as privacy, intellectual property and computer crimes and laws, and ethical and social analysis of these issues.
Programme Outcome 4: This subject contributes to training critical thinking through logical argument analysis assignment.
Programme Outcome 7: This subject contributes to cultivating team work spirit through group project.

Syllabus:

Topic	Duration of Lectures
1. Introduction Generic skills; typical scenarios of profession; characteristics of a profession; the system of professions; the Computing profession; social issues	3
2. Ethical principles What is ethics; traditional/philosophical ethics; relativism/utilitarianism/ deontology; rights/social contract/Rawl's theory of justice.	3
3. Computer ethics Policy vacuum; social context; is computer ethics unique?	3
4. Critical thinking and logical arguments	3
5. Ethical and social analysis Competing factors in decision making; practical approach/the 4-step analysis; sample cases.	3

6. Computer crimes and laws	3
7. Privacy Personal privacy; computer and privacy.	3
8. Accountability and responsibility Diffusion of accountability; buying/selling software.	3
9. Software ownership and intellectual property Ethical/legal issues of software; intellectual property; property rights; legal protection; philosophical basis; consequentialist argument.	3
10. Seminars/Tutorial, Case/scenario analysis presentation	15
Total	**42**

Laboratory Experiment: Nil

Guest Speakers:

Guest speakers are invited to discuss and share with students the state-of-the-art developments and opinions in the topics.

Method of Assessment:

The subject will be conducted both as a seminar and a lecture. Students are expected to read and understand the ideas in the reading, explain the ideas, analyze issues and see them from diverse perspectives, and formulate and critique arguments. Therefore, students are required to demonstrate this in class discussion and in written assignments. Quizzes will be given that aim at determining the student's grasp of the materials learned.

Continuous Assessment	100%
Class participation	10%
Quizzes/individual assignment	60%
Scenarios analysis/ Project (Group)	30%

Method of Assessment for Learning Outcomes:

Assessment method / task	% weighting	Intended subject learning outcomes to be assessed (Please check as appropriate)								
		1	2	3	4	5	6	7	8	9
Class participation	10	x	x	x	x	x				
Assignment: Logical argument analysis	20	x	x	x	x		x	x		x

Mid-term Quiz	20	x	x					x		
End-term Quiz	20	x	x					x		
Project: Case/scenario presentation and report	30	x	x	x	x	x	x		x	
Total	100									

Main Text:

1. Johnson, D.G., Computer Ethics (4th edition), Prentice Hall, 2009.

Reference Books:

2. Quinn, M.J., Ethics for the Information Age (3rd edition), Addison Wesley, 2009.
3. Rowland, D. and Macdonald, E., Information Technology Law, (3rd edition), Cavendish Publishing, London, 2005.
4. Tavani, H.T., Ethics and Technology, John Wiley & Sons, 2004
5. Bynum, T.W. & Rogerson, S., Computer Ethics and Professional Responsibility, Blackwell Publishing, 2004.
6. Kallman, E.A. & Grillo, J.P., Ethical Decision Making and Information Technology, McGraw-Hill, 1993.

Supplementary Reading:

7. Spinells, R.S. & Tavani, H.T., Readings in CyberEthics, Jones & Bartlett Publishers, 2004.
8. Todd, P., E-Commerce Law, Cavendish Publishing Pty Ltd, NSW, 2005.
9. Journal papers and press reports of current interest will be assigned as required and available.

Subject Code	ELC2401	**University English for the Faculty of Construction and Land Use**	
Credit	3 credits	Syllabus designer(s)	ELC staff
Level	2	Pre-requisites	Nil
Weight	0.2	Assessment Method	Continuous assessment: 100%
Contact Hour	Seminar: 42		

Objectives

This subject aims to help students study effectively in the University 's English medium learning environment and, more specifically, to improve and develop their English language proficiency within a framework of academic contexts.

In striving to achieve the two interrelated objectives, attention will be given to developing the core competencies the University has identified as vital to the development of effective life-long learning strategies and skills.

Learning outcomes

By the end of the subject, students should be able to communicate effectively in academic contexts through
1. writing academic texts using source materials from relevant literature,
2. writing discursive essays with in-text references, and
3. delivering effective oral presentations.

To achieve the above outcomes, students are expected to use language and text structure appropriate to the context, select information critically, and present and support stance and opinion.

Content

This content is indicative. The balance of the components, and the corresponding weighting, will be based on the specific needs of the students.

1. **Written academic communication**
   Identifying and practising writing functions common in written academic discourse; note-taking from reading and listening inputs; understanding and applying principles of academic text structure; developing paraphrasing, summarising and referencing skills; improving editing and proofreading skills; achieving appropriate tone and style in academic writing.

2. **Spoken academic communication**
   Recognising the purposes of, and differences between, spoken and written communication in English in academic contexts; identifying and practising the verbal and non-verbal interactional strategies in seminar discussions and oral presentations; discussing issues requiring the development and application of critical thinking.

3. **Reading and listening in academic contexts**
   Understanding the content and structure of information delivered orally and in print; reading and listening for different purposes e.g. as input to tasks, and for developing specific reading or listening skills; using a dictionary to obtain lexical, phonological and orthographical information.

4. **Language development**
   Improving and extending relevant features of grammar, vocabulary and pronunciation.

Teaching and learning approach

The study method is primarily seminar-based. Activities include teacher input as well as individual and group work involving drafting and evaluating texts, mini-presentations, discussions and simulations. Students will be referred to information on the Internet and the ELC's Centre for Independent Language Learning.

Learning materials developed by the English Language Centre are used throughout this course. Additional reference materials will be recommended as required.

Assessment

Continuous assessment: 100%

Students' oral and writing skills will be evaluated through assessment tasks related to the learning outcome areas. Students will be assessed on the accuracy and the appropriacy of the language used in fulfilling the assessment tasks, as well as the selection and organisation of ideas.

Indicative references

Billingham, J. (2003). *Giving presentations.* Oxford: Oxford University Press.

Carter, R., Hughes, R. & McCarthy, M. (2000). *Exploring grammar in context: Upper-intermediate and advanced*. Cambridge: Cambridge University Press.

Collins COBUILD advanced learner's English dictionary. (2006). Glasgow: HarperCollins.

Lebauer, S. (2000). *Learn to listen, listen to learn: Academic listening and note-taking*. San Francisco, CA: Addison Wesley Longman, Inc.

McCarthy, M. & O'Dell, F. (2001). *English vocabulary in use: Upper-intermediate*. Cambridge: Cambridge University Press.

Madden, C. & Rohlck, T.N. (1997). *Discussion and interaction in the academic community*. Ann Arbor, MI: University of Michigan Press.

Meyers, A. (2005). *Gateways to academic writing: Effective sentences, paragraphs and essays*. White Plains, NY: Longman.

Oshima, A. & Hogue, A. (2006). *Writing academic English* (4th ed.). White Plains, NY: Pearson/Longman.

Reinhart, S. M. (2002). *Giving academic presentations.* Ann Arbor, MI: University of Michigan Press.

Zwier, L. J. (2002). *Building academic vocabulary.* Ann Arbor, MI: University of Michigan Press.

Subject Code	ELC3403	**Workplace English for the Faculty of Construction and Land Use**	
Credit	3 credits	Syllabus designer(s)	ELC staff
Level	3	Pre-requisites	Nil
Weight	0.3	Assessment Method	Continuous assessment: 100%
Contact Hour	Seminar : 42		

Objective

This subject aims to develop the English language skills required by students to communicate effectively in their future professional careers.

Learning outcomes

By the end of the subject, students should be able to communicate effectively in workplace contexts through
1. interacting professionally in job interviews,
2. writing letters, memos and emails for workplace communication, and
3. writing reports which describe and interpret data in workplace contexts.

To achieve the above outcomes, students are expected to use language and text structure appropriate to the context, select information critically, and present and support stance and opinion.

Content

This content is indicative. The balance of the components, and the corresponding weighting, will be based on the specific needs of the students.

1. **Job interviews and work-related discussions**
   Practising the specific verbal and non-verbal skills required in communicating with potential employers in job-seeking interviews and with co-workers in workplace discussions.

2. **Workplace correspondence and reports**
   Selecting and using relevant content; organising ide as and information; maintaining appropriate tone, distance and level of formality; achieving coherence and cohesion; adopting an appropriate style, format, structure and layout.

3. **Language appropriacy**
   Using context-sensitive language in spoken and written English.

4. **Language development**
   Improving and extending relevant features of grammar, vocabulary and pronunciation.

Teaching and learning approach

The study method is primarily seminar-based. Activities include teacher input as well as individual and group work involving drafting and evaluating texts, mini-presentations, discussions and simulations. Students will be referred to information on the Internet and the ELC's Centre for Independent Language Learning.

Learning materials developed by the English Language Centre are used throughout this course. Additional reference materials will be recommended as required.

Assessment

Continuous assessment: 100%

Students' oral and writing skills are evaluated through assessment tasks related to the learning outcome areas. Students are assessed on the accuracy and the appropriacy of the language used in fulfilling the assessment tasks, as well as the selection and organisation of ideas.

Indicative references

Baugh, L. S., Fryar, M. & Thomas, D. A. (1995). *How to write first-class business correspondence*. Chicago: NTC Learning Works.

Bilbow, G. T. (2004). *Business writing for Hong Kong* (3rd ed.). Hong Kong: Longman Hong Kong Education.

Comfort, J. (1996). *Effective telephoning*. Oxford: Oxford University Press.

Deluca, M. J. (2001). *More best answers to the 201 most frequently asked interview questions.* New York: McGraw-Hill.

Guffey, M. E. (2004). *Essentials of business communication* (6th ed.). Mason, OH: South-Western College Pub.

Houp, K. W., Pearsall, T. E., Tebeaux, E. & Dragga, S. (2006). *Reporting technical information* (11th ed.). New York: Oxford University Press.

Huckin, T. & Olsen, L. (1991). *Technical writing and professional communication for nonnative speakers of English* (2nd ed.). New York: McGraw Hill.

Kennedy, G. E. & Montgomery, T. T. (2002). *Technical and professional writing: Solving problems at work.* Upper Saddle River, NJ: Prentice Hall.

Lehman, C. M. & DuFrene, D. D. (2005). *Business communication* (14th ed.). Mason, OH: Thomson/South-Western.

O'Driscoll, N. & Pilbeam, A. (1992). *Meetings and discussions.* Harlow, Essex: Longman.

Taylor, S. (2005). *Communication for business: A practical approach.* (4th ed.). Harlow, Essex: Pearson Longman.

Subject Code	ELC3404	**Job Application Skills (ELC3401 top-up)**	
Credit	1 credit	Syllabus designer(s)	ELC staff
Level	3	Pre-requisites	Nil
Weight	0.3	Assessment Method	Continuous assessment: 100%
Contact Hour	Seminar: 14		

Objective

This subject is a one-credit subject for students whose programme requires them to study the three-credit ELC3403 Workplace English for the Faculty of Construction and Land Use but have previously gained two credits by completing ELC3401 English in the Workplace for FCLU Students. The subject aims to develop the written and spoken English language skills required for effective communication in the job-seeking process.

Learning outcomes

By the end of the subject, students should be able to communicate effectively in workplace contexts through interacting professionally in a job interview.

To achieve the above outcome, students are expected to use language and text structure appropriate to the context, select information critically, and present and support stance and opinion.

Content

This content is indicative. The balance of the components, and the corresponding weighting, will be based on the specific needs of the students.

1. **Job application documents**
   Selecting and using relevant content, appropriate style and format, and structure and layout in résumés and job application letters.

2. **Job interviews**
   Practising the specific verbal and non-verbal interactive strategies for effective job interviews, including the skills of asking and answering interview questions.

3. **Language appropriacy**
   Using context-sensitive language in spoken and written English.

4. **Language development**
   Improving and extending relevant features of grammar, vocabulary and pronunciation.

Teaching and learning approach

The study method is primarily seminar-based. Activities include teacher input as well as individual and group work involving drafting and evaluating texts, mini-presentations, discussions and simulations. Students will be referred to information on the Internet and the ELC's Centre for Independent Language Learning.

Learning materials developed by the English Language Centre are used throughout this course. Additional reference materials will be recommended as required.

As the subject is offered only to those students who have successfully completed ELC3401 in their PolyU Higher Diploma programme, the mode of delivery may vary depending on the number of students who are required to study this one-credit, top-up subject. The content areas will be covered in seminars and/or tutorials, and will involve completion of independent learning tasks.

Assessment

Continuous assessment: 100%

Students' oral skills are evaluated through assessment tasks related to the learning outcome areas. Students are assessed on the accuracy and the appropriacy of the language used in fulfilling the assessment tasks, as well as the selection and organisation of ideas.

Indicative references

Baugh, L. S., Fryar, M. & Thomas, D. A. (1995). *How to write first-class business correspondence*. Chicago: NTC Learning Works.

Bilbow, G. T. (2004). *Business writing for Hong Kong* (3rd ed.). Hong Kong: Longman Hong Kong Education.

Deluca, M. J. (2001). *More best answers to the 201 most frequently asked interview questions.* New York: McGraw-Hill.

Lehman, C. M. & DuFrene, D. D. (2005). *Business communication* (14th ed.). Mason, OH: Thomson/South-Western.

Taylor, S. (2005). *Communication for business: A practical approach* (4th ed.). Harlow: Pearson Longman.

Subject Code	IC251	**Industrial Safety for Surveying and Geo-Informatics**	
Credit 1		Subject Lecturer	Mr. J Chung (IC) / Mr. LY Chow (IC) / Mr. WC Lee
Level 3		Scientific and Engineering (approx.)	0%
Weight			
Assessments	Exam: N/A	Mathematics (approx.)	0%
	CW: 100%		
Contact Hours	Lect. / Tut. : 15	Complementary (approx.)	100%
	PW: N/A		

The aim of this subject is:

- To provide students with basic knowledge of industrial safety at work commensurate with that required for Mandatory Basic Safety Training for construction industry.

KEYWORD SYLLABUS

A. **Overview:** Occupational safety and health legislation in Hong Kong; Codes of practice.

B. **Construction Safety:** Introduction to construction safety including common types of work-related accidents and diseases; Construction Sites (Safety) Regulations; potential hazards/risks associated with construction sites and preventive measures.

C. **Safety Technology:** Electrical hazards; first aid; ergonomics of office equipment & computer displays; manual lifting.

D. **Field Safety:** Hill fire procedures and precautions; insect and reptile bites; heat stress; hypothermia and exposure risks; accident and contingency plans; foul weather procedures and precautions; vehicle safety.

READING LIST

1. E-learning materials are provided via WebCT.

Assessment Methods in Alignment with Intended Learning Outcomes

Assessment Methods	Weighting (%)	Intended Learning Outcomes Assessed					
		a	b	c	d		
Multiple Choice Test	100	✓	✓	✓	✓		
Total	100						

A certificate titled "Certificate of Competent Person and Certified Worker, Sections 4(1) and 4(2) of the F&IU (Confined Spaces) Regulation, Cap 59" will be issued to students who have successfully completed the programme with the multiple choice test result of 75% or above, and 100% programme attendance.

Student Study Effort Required

Class Contact	
▪ Lecture	11 Hrs.
▪ Hands-on Practical Training	3 Hrs.
▪ Multiple Choice Test	1 Hr.
Other Study Effort	
▪ Nil	Hrs.
▪	Hrs.
Total Study Effort	**14 Hrs.**

Reading List and References

Labour Department, June 2000, *Code of Practice: Safety and Health at Work in Confined Spaces*, HKSAR.