

REGULATIONS FOR THE DEGREE OF MASTER IN GEOGRAPHIC INFORMATION SYSTEMS (MGIS)

(See also General Regulations)

Any publication based on work approved for a higher degree should contain a reference to the effect that the work was submitted to The University of Hong Kong for the award of the degree.

MGIS 1 Admission Requirements

Three categories of admissions are possible.

I. To be eligible for admission to 16-month full-time programme leading to the degree of Master in Geographic Information Systems, a candidate shall:

- (a) comply with the General Regulations;¹
- (b) hold
 - (i) a Bachelor's degree with honours (Second Class First Division) of this University; or
 - (ii) another qualification of equivalent standard from this University or from another University or comparable institution accepted for this purpose; and
 - (iii) possess relevant working experience where applicable;
- (c) satisfy the examiners in a qualifying examination, if required.

Candidates who have completed certificate programmes in GIS and related fields from another university or qualification of equivalent standard accepted for this purpose are eligible to apply for waiver of selected courses. Waiver must be approved by the Programme Coordinator prior to commencement of the courses. Not more than two courses per student may be waived normally. Approved waiver(s) will not entail a reduction in the annual fee.

II. To be eligible for admission to 24-month part-time programme leading to the degree of Master in Geographic Information Systems, a candidate shall:

- (a) comply with the General Regulations;¹
- (b) hold
 - (i) a Bachelor's degree with honours (Second Class First Division) of this University; or
 - (ii) another qualification of equivalent standard from this University or from another University or comparable institution accepted for this purpose; and
 - (iii) possess relevant working experience where applicable;
- (c) satisfy the examiners in a qualifying examination, if required.

If admitted to Year 1 of the MGIS programme, candidates who have completed certificate programmes in GIS and related fields from another university or qualification of equivalent standard accepted for this purpose are eligible to apply for waiver of selected courses. Waiver must be approved by the Programme Coordinator prior to commencement of the courses. Not more than two courses per student may be waived normally. Approved waiver(s) will not entail a reduction in the annual fee.

¹ In addition to the TOEFL requirement specified in General Regulation G 2, the Faculty also requires *either* a Test of Written English (TWE) score of 4 or above *or* an Essay Rating score of 4.0 or above in the computer-based TOEFL.

III. To be eligible for advanced standing or admission to Year 2 of part time programme leading to the degree of Master in Geographic Information Systems, a candidate shall:

- (a) hold
 - (i) A Bachelor's degree with honours (Second Class First Division) or another qualification of equivalent standard from this University or from another University AND a "Postgraduate Diploma in Applied GIS" in good standing from the School of Professional and Continuing Education (SPACE) of The University of Hong Kong; or
 - (ii) A Bachelor's degree with honours or another qualification of equivalent standard from this University or from another University AND another postgraduate qualification of equivalent standard in related fields accepted for this purpose (such as MA in Transport Policy and Planning, MSc in Urban Planning, and MSc in Environmental Management from The University of Hong Kong); and
 - (b) if admitted, be required to enrol in specific core courses as directed by the Programme Coordinator.
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MGIS 2 Qualifying Examination

- (a) A qualifying examination may be set to test the candidate's formal academic ability or his/her ability to follow the courses of study prescribed. It shall consist of one or more written papers or their equivalent and may include a project report.
 - (b) A candidate who is required to satisfy the examiners in a qualifying examination shall not be permitted to register until he/she has satisfied the examiners in the examination.
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MGIS 3 Award of Degree

To be eligible for the award of the degree of Master in Geographic Information Systems, a candidate shall

- (a) comply with the General Regulations; and
 - (b) complete the curriculum and satisfy the examiners in accordance with the regulations set out below.
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MGIS 4 Length of Curriculum

The curriculum shall normally extend not less than 16 months of the full-time programme or 24 months of the two-year part-time programme with a minimum of 300 hours of prescribed work.

MGIS 5 Completion of Curriculum

To complete the curriculum, a candidate shall:

- (a) follow courses of instruction and complete satisfactorily all prescribed written work;
- (b) complete and present a satisfactory dissertation on a subject within his/her approved field of study; and
- (c) satisfy the examiners in all prescribed courses and in any prescribed form of examination. The examiners may also prescribe an oral examination, if required.

Full-time candidates who have failed to complete the curriculum and satisfy the examiners in accordance with this set of regulations within 32 consecutive months (maximum period of registration) may be recommended for discontinuation of studies under the provisions of General Regulation G 12. Part-time candidates who have failed to complete the curriculum and satisfy the examiners in accordance with this set of regulations within four consecutive years (maximum period of registration) may be recommended for discontinuation of studies under the provisions of General Regulation G 12.

MGIS 6 Title of Dissertation

The title of the dissertation shall be submitted for approval not later than September 1 of the following year for full-time students and December 1 of the second year of study for part-time students. The dissertation shall be presented by November 15 (month 15) for full-time students and June 15 (month 22) for part-time students. The candidate shall submit a statement that the dissertation represents his/her own work undertaken after registration as a candidate for the degree.

MGIS 7 Assessment

- (a) A candidate's performance during the years of study may be assessed through written assignments, tests, laboratory and practical work, and examinations as prescribed by the courses.
 - (b) Examinations will be held at the end of the semester in which the courses are taken. A part-time candidate must satisfy the examiners in the first year examinations before proceeding to the second year. A candidate (both full-time and part-time) failing to satisfy the examiners in not more than two courses in the first 10 months may be permitted to sit a supplementary examination in the failed course(s) to be held before September of the following year. A candidate who has failed to satisfy the examiners in three or more courses in the first 10-month period may be required to repeat the curriculum and re-present himself/herself for the examinations or to discontinue his/her studies.
 - (c) A part-time candidate who has failed to satisfy the examiners in any one course in the second year of study but has presented a satisfactory dissertation may be permitted to present himself/herself for re-examination in the failed course on a specified date not less than 2 months nor more than 12 months after the publication of results.
 - (d) A part-time candidate who has presented an unsatisfactory dissertation but has satisfied the examiners in all the courses in the second year may be permitted to revise the dissertation and re-present it within a specified period of not less than 2 months and not more than 12 months after receipt of a notice that it is unsatisfactory.
 - (e) A part-time candidate who has failed to satisfy the examiners in two courses in the second year but has presented a satisfactory dissertation may be permitted to present himself/herself for re-examination in the failed courses at specified dates not less than 2 months nor more than 12 months after the publication of the results.
 - (f) A part-time candidate who has presented an unsatisfactory dissertation and has failed to satisfy the examiners in any one course in the second year may be permitted to present himself/herself for re-examination in the failed course and to revise and re-present the dissertation within a specified period of not less than 2 months nor more than 12 months after the publication of the results.
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MGIS 8 Postgraduate Diploma

A candidate (both full-time and part-time) who has passed the 8 courses but failed in his/her dissertation after re-examination and at the end of the programme duration - may be allowed to exit the programme with the "Postgraduate Diploma in Geographic Information Systems". Those who are allowed to take this exit path will not be re-admitted to MGIS.

MGIS 9 Discontinuation

- (a) A candidate who is not permitted to present himself/herself for re-examination in any course(s) in which he/she has failed to satisfy the examiners or to revise and re-present his/her dissertation within the specified period shall be deemed to have failed and shall be recommended for discontinuation under the provisions of General Regulation G 12.
- (b) A candidate who has failed to satisfy the examiners in a second attempt in any course(s) (other than the dissertation) may be required to discontinue his/her studies.

MGIS 10 Examination results

At the conclusion of the examination, and after presentation of the dissertation, a pass list shall be published in alphabetical order. Candidates who have passed all the 8 courses and dissertation will be issued with the “Master in Geographic Information Systems” degree certificate and a transcript which will show the letter grades of the passed courses and dissertation. A candidate who has shown exceptional merit in the 8 passed courses and dissertation may be awarded a mark of distinction, and this mark shall be recorded in the candidate's degree certificate.

SYLLABUS FOR THE DEGREE OF MASTER OF GEOGRAPHIC INFORMATION SYSTEMS

COURSE OF STUDY

Coursework teaching conforms to the dates of semesters of the Faculty of Arts. There are three sessions of two contact hours per week. Courses are assessed either by coursework, or a combination of coursework and examination. Examinations will normally be held at the end of the semester. Each candidate is required to take 4 core and 4 elective courses, plus a dissertation. The list of courses below is not final and is subject to changes and regular review.

CORE COURSES

Core courses are compulsory unless a student can demonstrate proven ability in the subjects. Students are advised to complete the 4 core courses in Year 1 of their study.

GEOG7200. Fundamentals of geographic information systems

Established on the convergence of a multitude of disciplines and sciences (including land surveying, cartography, computer science, geography, photogrammetry, and remote sensing), the Geographic Information System is one that requires extra effort to master. This course gives an overview of the fundamental concepts and principles of the Geographic Information System, with highlights on its capabilities, applications, and trend of development. (50% coursework; 50% examination)

GEOG7201. GIS data processing

Data quality determines the integrity of an application using GIS and related technologies. Data automation and processing have become a critical part in the study of Geographic Information Systems. Data model and structure, projection and reference, data preparation and conversion, resolution and accuracy, and macro programming are covered in the course. (50% coursework; 50% examination)

GEOG7202. Analysing GIS data

Space is a principal consideration, either implicit or explicit, in many decision-making processes. A map is an efficient communication channel as it can convey much information beyond the language medium. The capability to relate information of diverse sources to their geographical location thus distinguishes GIS from other information technology. This course focuses on how to make use of the powerful spatial analytical and mapping functions of GIS in finding solutions to our problems. (50% coursework; 50% examination)

GEOG7203. Programming for GIS

Computer programs form an integral part of a Geographic Information System. The increasingly open architecture of contemporary GIS programs allows greater flexibility, efficiency and effectiveness in their use through customised applications. Acquiring programming proficiency therefore is essential to keep pace with the fledged development of the science in this Internet era. (100% coursework assessment)

DISSERTATION

Each candidate in Year 2 of his/her study is required to complete a topical study or research project as partial fulfilment of the MGIS degree. The dissertation carries a weight approximately equivalent to two courses. Successful dissertations to be lodged in the Library shall be subject to the correction of typographical, grammatical and/or other errors as determined by the examiners.

GEOG7230. MGIS dissertation

The course includes two parts: (i) a topical study, and (ii) oral presentation. A topical study or research project must be completed in the form of a dissertation of 10,000 - 20,000 words, with a focus on GIS in an applied setting (such as planning, environmental protection and management, transport, housing, civil engineering, or architecture). The choice of topics may vary from year to year in response to demand and student composition. Each student is also required in Year 2 of their study to present their research project proposal in the "Dissertation Seminars". (100% coursework assessment)

ELECTIVE COURSES

Each candidate is required throughout the two-year programme to take 4 courses from the following 3 groups of elective courses, subject to the approval of the Programme Coordinator and availability of courses.

(A) ADVANCED GIS

GEOG7210. Photogrammetry and remote sensing (To be offered on alternate odd-year basis, i.e. 2005-06)

Remotely sensed data represent one form of reliable and economical source for timely information collection and update, especially in areas with as rigorous development as in Hong Kong. Data useful for land development planning, for instance, can be derived from aerial photographs and satellite images to facilitate further analysis. This course covers the techniques required for the capture, processing and analysis from aerial photos and satellite images by integrating photogrammetry and remote sensing with GIS technologies. (50% coursework; 50% examination)

GEOG7211. Digital terrain modelling (To be offered on alternate even-year basis, i.e. 2006-07)

The incorporation of terrain analysis functions in GIS adds new perspectives to local engineering and planning professionals where slope safety has always been a major concern given the hilly terrain of the Territory. This course gives an overview of the Digital Terrain Modelling techniques with an emphasis on their applications in the engineering and planning fields. (50% coursework; 50% examination)

GEOG7212. Cartographic presentation and visualisation (To be offered on alternate even-year basis, i.e. 2006-07)

Maps have been used for centuries to describe spatial patterns and portray association and correlation. Recent developments in digital spatial data handling have changed the environment where maps are used. Maps are no longer confined to the printed format. The lectures will cover fundamental concepts underlying different mapping/analytical techniques, their strengths, limitations, and application settings. The practicals will be devoted to imparting essential computer operating and map composition skills to visualize spatial data. (50% coursework; 50% examination)

GEOG7213. Topics in database systems (To be offered on alternate even-year basis, i.e. 2006-07)

Non-spatial data (such as race or income) may be joined to geocoded files with matching attributes and displayed as regular maps. This is common in geographic information processing. Non-spatial data are stored in database systems (such as IBM DB2, IBM Informix, Microsoft SQL Server, and Oracle) for selective retrieval, query, and manipulation. This course introduces the database concept and focuses on middle management concerns of multi-user and integrated systems for GIS processing. (50% coursework; 50% examination)

GEOG7214. Spatial and geostatistical data analysis (To be offered on alternate odd-year basis, i.e. 2005-06)

This course gives an introduction to the theory and practice of geostatistics in the context of environmental mapping and modelling with GIS. Geostatistical techniques bridge the gap between statistics and GIS. In environmental applications, geographic samples of soil, water or air are often interpolated to create continuous/statistical surfaces. The process of sampling and mapping of natural phenomena is often complicated by complex spatio-temporal variations. Geostatistics offer scientifically sound methods for describing such complex patterns and examining spatial variability based upon spatial statistical theories. They can assist in determining appropriate field sampling schemes and the optimal interpolation of sample data to areas or maps. Students will undertake a variety of hands-on assignments including data representation, spatial modelling, error assessment, and interpretation of results. (50% coursework; 50% examination)

(B) APPLICATIONS

GEOG7220. Environmental mapping and risk assessment (To be offered on alternate odd-year basis, i.e. 2005-06)

The integration of digital terrain modelling with spatial and statistical analysis makes GIS a powerful tool for environmental mapping and risk assessment. Landslide, for example, has been a widespread phenomenon in Hong Kong that hampers development into hilly regions prone to frequent landslide occurrences. The ability to map areas that are more risky than others is therefore important in hazard mitigation as well as land development planning. (50% coursework; 50% examination)

GEOG7221. Internet GIS (To be offered on alternate even-year basis, i.e. 2006-07)

The advent of GIS based upon client/server systems for operation over the Internet and/or Intranet has created new needs and opportunities for geographic analysis and research. Spatial information exchange and distribution will be made much easier with the widespread use of the Internet. This course focuses on the essentials of developing client/server GIS applications on the Internet. (50% coursework; 50% examination)

GEOG7222. GIS in transport planning and management (To be offered on alternate odd-year basis, i.e. 2005-06)

A theoretical framework and the various aspects (economic, social, ecological, and behavioural) of transportation systems are essential to put transportation issues in a societal context. This course introduces the spatial structures and developments of transport systems and the ways they are examined. It covers analytical tools and major techniques used in transportation field concerning spatial arrangements and impacts. (50% coursework; 50% examination)

GEOG7223. GIS project management (To be offered on alternate odd-year basis, i.e. 2005-06)

Managing a GIS project requires expertise in data organisation, systems configuration, institutional support, and skilled personnel. This course presents the above aspects in various project development phases. Topics include needs assessment, organizational and institutional issues, building staff competency, working with vendors and consultants, project management and scheduling tools, budgeting, and planning. An overview of typical GIS programs is presented, and each component (hardware/software, data conversion/creation, training, maintenance, standards, etc.) is discussed in terms of the manager's role in building a successful system. Both successful and failed case studies will be used to impart the essentials of managing a GIS project. (100% coursework assessment)

GEOG7224. GIS workshop or internship

Special GIS workshop or training lasting at least 3 weeks in duration may be offered from recognised institutions overseas. Interested students may participate in these workshops subject to prior approval of the Programme Coordinator. The students will also bear the associated costs of travel, training, and miscellaneous expenses. (100% coursework assessment)

GEOG7225. GIS in health studies (To be offered on alternate even-year basis, i.e. 2006-07)

The idea of applying GIS techniques in health-related studies is no longer new. Indeed, GIS has been used for more than a decade in the western countries and a flooding of applications in the health care sector reflects its significance. This course discusses how a GIS is used to address and analyze pressing health problems from the geographical perspective. It covers such topics as theoretical and practical issues, simple disease mapping, disease pattern analysis, and spatial modeling techniques. The course will be conducted in a series of lectures and hands-on practices in a problem-based learning environment. (50% coursework; 50% examination)

(C) ADDITIONAL COURSES

(CANDIDATES CAN SELECT NOT MORE THAN ONE COURSE FROM THIS GROUP OF COURSES. SELECTION OF COURSES FROM THIS GROUP MAY ENTAIL ADDITIONAL COURSE FEE TO BE BORNE BY THE CANDIDATES.)

CIVL6025. Environmental impact assessment of engineering projects

To be offered by the FACULTY OF ENGINEERING – Department of Civil Engineering (Master of Science in Engineering)

Environmental impact assessment process; methodologies to assess environmental impacts on water, air, and land; environmental management; case studies, e.g. on transportation projects, environmental control facilities and reclamation works. (Assessment ratio: To be advised.)

CSIS7503. Multimedia technologies

To be offered by the FACULTY OF ENGINEERING – Department of Computer Science (Master of Science in Computer Science)

To study selected topics of multimedia technologies in depth. Topics include compression algorithms, storage systems, steganography and watermarking. (50% coursework; 50% examination)

ECOM6004. Legal aspects of I.T. and E-Commerce

To be offered by the FACULTY OF ENGINEERING – Department of Computer Science (Master of Science in Electronic Commerce and Internet Computing)

This module provides an introduction to some of the main legal problems generated by recent developments in information technology and e-Commerce, and their possible solutions. Topics to be covered include copyright, patent protection for software and business methods, domain name disputes and other intellectual property issues on the Internet, contractual issues of on-line trading, public key infrastructure and electronic transactions, privacy and data protection, and computer crimes. If time permits, the situation in the People's Republic of China will also be covered. (40% coursework assessment)

GEOG7001. Survey and data analysis in transport studies

To be offered by the FACULTY OF ARTS – Department of Geography (Master of Arts in Transport Policy and Planning programme)

Surveys are commonly used to collect useful data in transport studies. A myriad of survey methods and instruments are available. This course covers the major aspects including survey design, sampling, hypothesis testing, interview and questionnaire design, survey implementation and administration, computer-based data processing, analysis and retrieval and report writing. Different aspects of surveys are discussed with reference to the transport-related professions and disciplines in different political and socio-economic contexts. Examples include travel characteristics, origin-destination, freight and public transport surveys conducted in Hong Kong and the other parts of the world. The applications of geographic information system (GIS) in transport studies are also covered. (100% coursework assessment)

GEOG7009. Transport logistics planning and services management

To be offered by the FACULTY OF ARTS – Department of Geography (Master of Arts in Transport Policy and Planning programme)

Logistics has to do with the inbound and outbound of freight and passengers and the corresponding areas of inventory management, warehousing, packaging and information system. This course introduces and applies management techniques to supply chain management in a global setting and in the context of public policy and corporate operations. It introduces principles and approaches, leading to student knowledge and experience in management decision making applied to business logistics. It uses readings, lectures, presentations, group work, and cases, using a largely qualitative approach. Topics include the management process, management decision making, supply chain management, information systems, logistics networks and channels, risk management in global operations, performance measurement, total quality management, public policy issues in logistics, and corporate structures and approaches. (100% coursework assessment)

RECO6029. Information management in construction

To be offered by the FACULTY OF ARCHITECTURE – Department of Real Estate and Construction
(Master of Science in Real Estate)

The course covers the concepts of information management, business information systems and computerization in the construction industry. It introduces the principles and applications of systems analysis and design. It also focuses on special IT applications in construction including computer-aided design and multimedia systems. (50% coursework assessment)