



THE HONG KONG INSTITUTE OF
SURVEYORS

香港測量師學會

LAND SURVEYING DIVISION

ASSESSMENT OF PROFESSIONAL COMPETENCE

RULES AND GUIDE

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APPENDIX I: COMPETENCE AREAS

RULES AND GUIDE TO THE ASSESSMENT OF PROFESSIONAL COMPETENCE LAND SURVEYING DIVISION

1 DEFINITIONS

The following expressions used in this Rules and Guide are defined with the respective meanings:

- 1.1 “Institute” means the Hong Kong Institute of Surveyors.
- 1.2 “LSD” means the Land Surveying Division of the Institute.
- 1.3 “LSDEC” means the Land Surveying Division Education Committee.
- 1.4 “APC” means the Assessment of Professional Competence of LSD.
- 1.5 “Corporate Member” means any Fellow or Member of LSD.
- 1.6 “Candidate” means the candidate applying for or having been approved for entry to the APC.
- 1.7 “Employer” means the director of a firm or government department in which the Candidate is employed, or a person working in the same firm or government department who assumes the capacity to certify the Candidate’s employment status.
- 1.8 “Counsellor” means a Corporate or Associate Member of LSD with at least 5 years standing in the respective membership who is engaged by the Candidate to undertake the responsibilities of the Counsellor as specified in this Rules and Guide. For Professional Training, a Counsellor must be a Corporate Member of LSD.
- 1.9 “Supervisor” means a Corporate or Associate Member of LSD with at least 3 years standing in the respective membership who is engaged by the Candidate to undertake the responsibilities of the Supervisor as specified in this Rules and Guide. For Technical Training only, a Supervisor can be a professional or technical person of equivalent standard as the Institute may recognize.
- 1.10 “Assessor” means the assessor(s) and/or co-assessor(s) appointed by LSDEC to conduct an assessment on a specific item of the APC.

- 1.11 “Land Surveying Practice” means practicing in any one of the nine specialized fields of the land surveying profession as specified in Section 7.3.
- 1.12 “Technical Training” means the training provided to a Candidate to develop technical skills under supervision.
- 1.13 “Professional Training” means the training, inclusive of Technical Training, provided to a Candidate to develop professional competence under supervision.

2 OBJECTIVES

The APC is a training and assessment scheme. Its purpose is to provide a path for those with recognised qualification to seek for themselves admission as a Member of the Institute. Through the Professional Training as required for the APC, Candidates are expected to develop a high standard of professional and ethical competences. The warrant of such competences is achieved by the requirements and assessments as set out in this Rules and Guide.

3 REQUIREMENTS OF APC

- 3.1 The APC scheme consists of the following training and assessment components:
- (a) A minimum period of training depending on the Candidate’s qualification as specified in Section 3.5, including at least 20 hours of Pre-Qualification Structured Learning (PQSL) in each year of the minimum period of training.
 - (b) Part I Written Assessment in the form of an examination paper.
 - (c) Part I Assessment Interview for qualifying the Candidate for admission to Associate Member of the Institute (AMHKIS).
 - (d) Part II Written Assessment in the form of a written report on an approved practical task.
 - (e) Part II Assessment Interview for qualifying the Candidate for admission to Member of the Institute (MHKIS).
- 3.2 Candidates are required to have obtained any one of the following qualifications:
- (a) A cognate graduate degree recognized by the Institute [Q1].
 - (b) A non-cognate but relevant graduate degree recognized by the Institute [Q2].
 - (c) Any other graduate degree and after having obtained such degree been engaged in Land Surveying Practice for not less than one year [Q3].
 - (d) A cognate sub-degree or diploma recognized by the Institute [Q4].

(e) Associate membership of the Institute [AMHKIS].

3.3 Candidates of the respective qualifications, depending on the nature of training they received, are required to take the Part I and/or Part II assessments as specified in the following table:

Qualification	Training	Part I		Part II		Admission to
		Written Assessment	Assessment Interview	Written Assessment	Assessment Interview	
Q1	Technical	✓	✓	/	/	AMHKIS
	Professional	✓	Optional	✓	✓	MHKIS
Q2	Technical	✓	✓	/	/	AMHKIS
	Professional	✓	Optional	✓	✓	MHKIS
Q3	Technical	✓	✓	/	/	AMHKIS
	Professional	✓	Optional	✓	✓	MHKIS
Q4	Technical	✓	✓	/	/	AMHKIS
AMHKIS	Professional	/	/	✓	✓	MHKIS

3.4 Candidates who receive Professional Training should opt to take the Part I Assessment Interview if they want to obtain the associate membership before becoming a Member.

3.5 Candidates of the respective qualifications, depending on the nature of training they received, are required to undergo the minimum period of training as specified in the following table:

Qualification	Training	Part I	Part II	Admission to
Q1	Technical	1 year	/	AMHKIS
	Professional	2 years (*1 year for Part I Assessment Interview)		MHKIS
Q2	Technical	1 year	/	AMHKIS
	Professional	3 years (*1 year for Part I Assessment Interview)		MHKIS
Q3	Technical	1 year	/	AMHKIS
	Professional	3 years (*1 year for Part I Assessment Interview)		MHKIS
Q4	Technical	2 years	/	AMHKIS
AMHKIS	Professional	/	3 years	MHKIS

(*Required only when a Candidate wishes to be admitted as AMHKIS)

3.6 Having identified the assessment components and training period as necessary, Candidates can pursue the APC by undergoing the following processes as necessary using the APC forms specified and to fulfil the relevant requirements as described in the specified sections:

APC Process	APC Form	Section
Application for Entry to APC	APC-1/LS	5
Notification of Change of Training Profile	APC-1S/LS	6
Submission of Training Records	APC-2/LS	9
Application for Part I Written Assessment	APC-3/LS	10
Application for Part I Assessment Interview	APC-4/LS	11
Application for Approval of Practical Task	APC-5/LS	12
Application for Part II Written Assessment	APC-6/LS	13
Application for Part II Assessment Interview	APC-7/LS	14

4 ARRANGEMENT OF TRAINING

4.1 Candidates must seek for themselves the following training arrangements:

- (a) Be employed in a practice where training can be suitably provided or be engaged in a full-time research on a project that may be approved by LSDEC.
- (b) To engage a Supervisor who undertakes to provide immediate supervision and guidance to the Candidate in carrying out his/her day-to-day work.
- (c) To engage a Counsellor who undertakes to oversee the training progress of the Candidate and to ensure that the training meets the requirements of the APC.

4.2 The engagements of the Counsellor and Supervisor may be arranged by the Employer, or by the Candidates themselves subject to the agreement of the Employer.

4.3 Corporate Members may undertake to provide both Professional and Technical Training. Associate Members can undertake to provide Technical Training only.

4.4 Each Supervisor is allowed to have a maximum of 8 trainees at the same time provided that the number of professional trainees, if any, is not more than 3. The maximum number of trainees may be exempted if such arrangements are temporary and, in any case, not longer than 3 months.

4.5 A Candidate is considered no longer under the supervision of his/her Supervisor when:

- (a) the Candidate has completed earning the minimum period of training experience as requested by the Institute;
- (b) the Institute is informed by the Candidate or his/her Supervisor of termination of the supervision; or

- (c) the Candidate is disqualified or no longer eligible for APC.
- 4.6 The Counsellor and Supervisor should ideally be two different persons. Only when such an arrangement is not available, the same person may undertake both roles.
- 4.7 The Counsellor and/or Supervisor can be the Employer of the Candidate.
- 4.8 Candidates who have difficulty to engage a Counsellor and/or Supervisor to undertake their training may apply to the Institute for a volunteer Counsellor and/or Supervisor. However, the Institute does not guarantee that such a volunteer Counsellor and/or Supervisor can always be arranged.

5 ENTRY TO APC

- 5.1 Subject to Section 5.2, on application for entry to and in the course of the APC, a Candidate must be a Probationer or Associate Member of the Institute holding any one of the qualifications as specified in Section 3.2.
- 5.2 In case the Candidate concurrently applies for Probationer/Associate membership or his/her application for such membership is being processed by the Institute, the approval for entry to APC, if granted by LSDEC, is subject to his/her successful enrolment as a Probationer/Associate Member. The approved APC commencement date for the Candidate will not be affected even if the Candidate's enrolment to Probationer/Associate Member is effected on a later date.
- 5.3 Candidates are required to provide details of their proposed training arrangements as specified in Section 4.1 by completing Form APC-1/LS, which must be duly signed by the Candidate, the Supervisor, the Counsellor and the Employer, and submitting the same together with documentary proof of their academic qualification to the Institute for approval.
- 5.4 Supervisor and Counsellor are required to confirm the nature of the training, either professional or technical, to be provided to the Candidate in the Form APC-1/LS.
- 5.5 Candidates may apply for exemption from part of the training experience required for APC by submitting the justification, normally relevant training or research experience in the Land Surveying Practice already acquired, with supporting documents for consideration by LSDEC. The exemption, if granted, will not exceed 12 months. Under no circumstances, the training period for a Candidate is less than 12 months.
- 5.6 Candidates when apply for entry to APC must pay an application fee. The application fee shall be non-refundable.

- 5.7 LSDEC is responsible for the approval or disapproval of the applications for entry to APC. Approval is granted on the basis of the Candidate's eligibility as specified in Section 5.1 and the acceptance by LSDEC of the Candidate's proposed training arrangements. In determining an APC commencement date for the Candidate, LSDEC would refer to the training commencement date proposed by the Counsellor in the application form (APC-1/LS) but, in any case, the APC commencement date is no earlier than 1 month before the date of application.

6 CHANGE OF TRAINING PROFILE

- 6.1 Candidates must notify the Institute using Form APC-1S/LS within 1 month from the date of change of their training profile including:
- (a) Change of Supervisor, Counsellor or Employer;
 - (b) Change of training nature, i.e. Professional or Technical Training;
 - (c) Change of training status, e.g. temporary suspension of Professional/Technical Training.
- 6.2 The Institute may suspend the Candidate's training if the Candidate fails to notify the Institute within 1 month from the effective date of such changes or such changes do not meet the requirements as specified in Section 4.
- 6.3 Applications for APC Assessment may be rejected if the Institute finds that the Counsellor or Supervisor who signs any documents for such applications is not the same as the ones accepted by the Institute on record.

7 TRAINING EXPERIENCE

- 7.1 Candidates must meet the minimum years of Technical Training before they are allowed to apply for Part I Assessment Interview.
- 7.2 Candidates must meet the minimum years of Professional Training in total before they are allowed to apply for Professional Assessment.
- 7.3 Training experience must be gained in at least one of the following nine specialized fields of the Land Surveying Practice and should cover as broadly as practicable within each field the competence areas as listed in Appendix I:
- (a) Cadastral Surveying
 - (b) Engineering Surveying
 - (c) Topographical Surveying
 - (d) Geodetic Surveying
 - (e) Hydrographic Surveying

- (f) Photogrammetry and Remote Sensing
 - (g) Mapping and Cartography
 - (h) Geographic Information System
 - (i) Utility Surveying
- 7.4 For Professional Training, candidates should also enrich and reinforce their professional competence by equipping themselves with knowledge in the following areas:
- (a) Professional ethics and conduct
 - (b) Project management
 - (c) Contract administration
 - (d) Quality management
 - (e) Information technology systems and applications
 - (f) Legislations and regulations
 - (g) Business skills
 - (h) Managerial skills
 - (i) Presentation skills
- 7.5 Candidates are required to specify in the relevant training records the specialized field(s) that they have received training.
- 7.6 Training experience may be gained by way of full-time research in academic institutes. However, the Candidate must apply to LSDEC in writing in advance for approval of the research topic(s) which must be relevant to the Land Surveying Practice.
- 7.7 Training experience must be gained under proper guidance of the Supervisor and Counsellor.
- 7.8 Training experience must be gained in a practice or an establishment where Land Surveying Practice is principally or essentially involved.
- 7.9 Training experience must be gained mainly in Hong Kong, unless global practice is involved.
- 7.10 Training experience must be documented in the training records as described in Section 8 unless otherwise specified.

8 TRAINING RECORDS

8.1 Work Diary (applicable to Professional Training only)

- (a) Candidates are required to keep a Work Diary to record their Professional Training experience gained throughout the training period as specified by LSDEC.
- (b) Apart from providing evidence about the training experience gained by the Candidate, the Work Diary is also the data source for preparation of the Log Sheet and Progress Summary.
- (c) Work Diary should not be confined to describing the tasks done by the Candidate. Instead, it should cover a multitude of aspects relevant to the tasks that have been explored or studied by the Candidate to broaden his/her professional knowledge and experience.
- (d) Candidates may seek the views of their Supervisor on the preferred style and format of the Work Diary, bearing in mind the guidelines as given in (b) and (c) above.
- (e) Candidates should submit the Work Diary together with the Log Sheet to their Supervisor for scrutiny at least once a fortnight. The same should be submitted to the Counsellor once a month for reviewing the progress (particularly the breadth and depth) of the training.
- (f) Each piece of Work Diary must be recorded on Form APC-R1/LS in a clear and concise manner.
- (g) The keeping of Work Diary is not required for Professional Training experience gained by way of full-time research as described in Section 7.6.

8.2 Log Sheet (applicable to Technical Training and Professional Training)

- (a) Candidates are required to keep a Log Sheet listing out all the training tasks that the Candidate has carried out to acquire the respective Technical/Professional Training experiences in chronological order.
- (b) The Log Sheet is to enable the Assessor to determine whether the training experience gained by the Candidate is adequate and properly balanced.
- (c) The Log Sheet must be compiled using Form APC-R3/LS.
- (d) The keeping of Log Sheet is not required for the Professional Training experience gained by way of full-time research as described in Section 7.6.

8.3 Progress Summary (applicable to Professional Training only)

- (a) Candidates are required to prepare Progress Summaries of their Professional Training received using Form APC-R2/LS. Each Progress Summary should cover a training period of not more than 6 months.

- (b) Candidates should introduce the tasks and the work done in about 500 words. They should also include the key learning and experience gained in about 1500 words.
- (c) In case the Professional Training received is segregated into different segments due to training arrangement or whatever reasons, it is advisable to prepare a separate Progress Summary for each segment of Professional Training if the relevant period is less than 6 months.
- (d) A Progress Summary is to give the Assessor a comprehensive picture of the Professional Training experience gained by the Candidate during the training period. It should not be a detailed job report. Rather, the Progress Summary apart from giving an introduction of each task and a brief description of the Candidate's works done should focus on the key learning acquired in each specialized field and general professional experience gained by the Candidate.

8.4 Pre-Qualification Structured Learning (PQSL)

- (a) PQSL is complementary to the training. It would exhibit a Candidate's endeavour to broaden his/her knowledge and skills, keep abreast of changing environments and trends and develop personal qualities throughout the training.
- (b) The following list provides a quick reference to the variety of activities that qualify for PQSL. The list serves as examples and is not exhaustive. The choice of activity should be carefully matched to the skill level the Candidate expects or would like to exhibit, and it must provide certain added knowledge.
 - (i) Formal events:
 Attending CPD events, courses, seminars, conferences, workshops, briefing sessions, lectures, career talks and technical visits.
 - (ii) Structured learning and programmes:
 Full/part-time study, distance learning, research for publication, developing IT/business/management skills.
 - (iii) Community, institutional and social services:
 Attending or helping in institutional functions and participating in voluntary works for the community.
 - (iv) Private study:
 Using audio, video or multi-media resources and HKIS library services.
- (c) PQSL hours should be calculated as follows:
 - (i) To qualify for PQSL, an event must last for a minimum of half an hour.

- (ii) Hours counted should be net of travelling time to the event, and should exclude breaks of longer than half an hour unless another PQSL activity takes place during the break (e.g. lunch time speaker during a conference).
 - (iii) PQSL hours should be rounded up to the nearest half hour.
 - (iv) Individual events will only count for a maximum of ten hours unless specifically endorsed by the Institute.
 - (v) In the event of a dispute over accountability, the number of hours to be counted, or attendance at a PQSL event, the decision of the Institute shall be final.
- (d) Candidates should keep all receipts for attendance, tickets, and other evidence of attendance in case they are required for verification purposes.
 - (e) Attendances of PQSL must be recorded in their chronological order using the PQSL Record Sheet (Form APC-R4/LS) for submission.

9 SUBMISSION OF TRAINING RECORDS

- 9.1 Candidates must tender submission of their training records to the Institute to record their training experience earned and to qualify themselves for subsequent applications.
- 9.2 Each submission should include the following training records:-
 - (a) Work Diary (for Professional Training only);
 - (b) Progress Summary (for Professional Training only);
 - (c) Log Sheet; and
 - (d) PQSL Record.
- 9.3 Each submission must cover a training period of not less than 6 months or the remaining period of Training experience required. The Log Sheet must be duly signed by the Supervisor.
- 9.4 Form APC-2/LS must be used for the submission and must contain the Counsellor's endorsement of the submission and his/her certification of the Candidate's fulfilment of the training requirements.

10 PART I WRITTEN ASSESSMENT

- 10.1 Part I Written Assessment is to assess the technical competence of Candidates.
- 10.2 Candidates may apply for the Part I Written Assessment, which is normally held twice a year, as soon as they have entered the APC.

10.3 Form APC-3/LS must be used to apply for the Part I Written Assessment

11 PART I ASSESSMENT INTERVIEW

11.1 Candidates are eligible to apply for Part I Assessment Interview provided that they:-

- (a) have passed the Part I Written Assessment;
- (b) have earned the minimum period of training experience required as specified in Section 3.5; and
- (c) have acquired a minimum aggregate of 20 hours PQSL per year of the training period required.

11.2 Candidates should use Form APC-4/LS to apply for Part I Assessment Interview.

11.3 The Candidate will be required to answer questions on his/her training experience, PQSL record, technical knowledge on land surveying theories, practice and technology, and general knowledge on institutional matters. The interviewers will be looking for the following attributes from the candidate:

- (a) adequate Technical Training experience;
- (b) awareness of up-to-date land surveying related knowledge and technology; and
- (c) proper attitude towards the land surveying profession.

11.4 The Assessment Interview will be conducted by 3 interviewers comprising either three Corporate Members or two Corporate Members and one Associate Member of the Land Surveying Division. The interview may be conducted in English or Chinese language depending on the candidate's usual spoken language at work.

12 PRACTICAL TASK FOR PART II WRITTEN ASSESSMENT

12.1 Candidates are required to demonstrate their attained level of professional competence by carrying out one or more practical task(s) and completing a written report in English for Part II Written Assessment.

12.2 The practical task(s) for Part II Written Assessment must:

- (a) be principally carried out by the Candidate under proper guidance of the Supervisor and Counsellor;
- (b) have engaged the Candidate for at least 2 months.

12.3 Candidates are required to apply for approval of the practical task(s) using Form APC-5/LS and provide therein:

- (a) the title of the practical task(s);
 - (b) a synopsis in 500 to 1000 words;
 - (c) the Supervisor's confirmation that the practical task is to be completed by the Candidate under his/her supervision; and
 - (d) the Counsellor's endorsement of the application.
- 12.4 The application for approval of practical task will not be accepted unless the Candidate has already submitted training records for not less than half of the relevant minimum training period specified in Section 3.5.
- 12.5 The submitted written report is to be assessed on the following aspects:
- (a) Application of knowledge such as:
 - relevance and correctness;
 - breadth of knowledge;
 - depth of understanding;
 - effectiveness of applying the knowledge.
 - (b) Demonstration of professional skills such as:
 - identification of project requirement;
 - implementation of technical, legal and professional standards;
 - devising and comparing methods;
 - performing practical skills.
 - (c) Demonstration of professional aptitude such as:
 - ability to analyze problems;
 - ability to formulate approach to solution;
 - ability to evaluate results;
 - ability to conclude findings and make recommendation.
 - (d) Layout and presentation such as:
 - content layout;
 - clarity in expression;
 - use of English;
 - use of illustrations.
- 12.6 Depending on the nature of the practical task(s), the written report should contain 4000 to 8000 words, exclusive of data and computations.
- 12.7 Source materials including online resources quoted in the written report must be properly acknowledged. Restricted or sensitive information should be blinded or faked if unavoidably used in the written report.

13 PART II WRITTEN ASSESSMENT

- 13.1 Candidates are eligible to apply for Part II Written Assessment provided that they:
- (a) have accumulated Professional Training experience as specified in Section 3.5 or at the earliest, 3 months before the required total Professional Training experience;
 - (b) have obtained approval from the Institute of the practical task(s) for Part II Written Assessment; and
 - (c) have acquired a minimum aggregate of 20 hours PQSL per year of the training period required.
- 13.2 Submissions for Part II Written Assessment include:
- (a) Training records covering the training period so far completed but not yet submitted.
 - (b) Two copies of the written report and its softcopy saved in an appropriate storage media such as an optical disc.
- 13.3 Applications for Part II Written Assessment must be made using Form APC-6/LS. The application form should be completed with:
- (a) The Candidate's declaration that the written report is his/her own work.
 - (b) The Candidate's agreement that the Institute may retain, dispose of, duplicate or release for reading by others of the written report.
 - (c) The Counsellor's endorsement of the application and certification of the submissions under application.
- 13.4 Candidates are advised to obtain the necessary consent from the owner of the data used in the written report
- 13.5 Failing in the Part II Written Assessment, a Candidate will be requested to either rewrite his/her original work or prepare a fresh written report on a different practical task for re-assessment. For the former case, re-attempt must be made within 6 months from the date of notification of result.

14 PART II ASSESSMENT INTERVIEW

- 14.1 Candidates are eligible to apply for Part II Assessment Interview provided that they:
- (a) have passed the Part I Written Assessment;
 - (b) have passed the Part II Written Assessment; and
 - (c) have submitted the training records covering the training periods specified for the Candidate.

- 14.2 Applications for Part II Assessment Interview must be made using Form APC-7/LS.
- 14.3 An interview panel is to be formed with the composition of the assessors of the Part II Written Assessment of the Candidate and members from LSDEC.
- 14.4 The interview is conducted in English. Candidates are required to present their practical task in about 30 minutes then answer questions of the panel members who will be looking for the following competences and attributes of the Candidate:
- (a) Adequacy of Professional Training experience;
 - (b) Appreciation of the written report content (or the additional writing for re-assessment);
 - (c) Professional knowledge of the Land Surveying Practice;
 - (d) Professional ethics and conduct;
 - (e) Cognition of institutional matters;
 - (f) Presentation skill and personal appearance.

15 ASSESSMENT RESULT

- 15.1 Any assessment result of the APC is to qualify or lead to qualify a Candidate for admission as a Member (MHKIS) or Associate Member (AMHKIS) of the Institute. Candidates, after passing an Assessment Interview, must apply to the Institute's Board of Membership for approval of admission to the respective membership.
- 15.2 A Candidate, if fails in any part of the assessments, may apply for the assessment again subject to fulfilment of the requirements, if any, as advised by the Institute and payment of a prescribed fee. Relevant application form must be used for application for re-assessment.
- 15.3 A Candidate, if requested by the Institute to extend his/her training for a specified minimum period, must keep preparing the training records and continue the PQSL as required for his/her training during the extension period.
- 15.4 The Institute's decision on all assessment results shall be final and shall not be subject to appeal.

16 APPLICATIONS AND ENQUIRY

- 16.1 The APC applications and the normal processing time for their results are listed in the table below:

<i>Application</i>	<i>Form</i>	<i>Normal time for result</i>
Entry to APC	APC-1/LS	2 months
Part I Written Assessment	APC-3/LS	2 months
Part I Assessment Interview	APC-4/LS	1 month
Approval of Practical Task	APC-5/LS	2 months
Part II Written Assessment	APC-6/LS	3 months
Part II Assessment Interview	APC-7/LS	1 month

- 16.2 Application and training record forms as specified in this Rules and Guide can be downloaded in the Institute's website at www.hkis.org.hk.

- 16.3 Applications should be made to the Institute at the following address:

The Education Department
The Hong Kong Institute of Surveyors
Room 1205, 12/F Wing On Centre
111 Connaught Road Central
Sheung Wan, Hong Kong

- 16.4 Enquiry about the APC could be made to the above address or the following contacts:

Telephone: (852) 2526 3679
Facsimile: (852) 2868 4612
E-mail: edudept@hkis.org.hk

17 NOTES

- 17.1 The Institute reserves the right to amend the Rules and Guide without prior notice.
- 17.2 All matters or disputes relating to the Rules and Guide are subject to the final decision of the Institute.

- END -

COMPETENCE AREAS

Cadastral Surveying

- Land boundary records
- Land registration systems
- Boundary evidences and re-establishment
- Land boundary surveys
- Land related legislations
- Land dispute and resolution
- Land administration and management

Engineering Surveying

- Detail and as-built surveys
- Setting out and positioning methodologies
- Deformation and monitoring surveys
- Survey instrumentation
- Alignment design
- 3D modelling
- Project management and engineering practice
- Site safety and management

Topographical Surveying

- Mapping standards and specifications
- Map updating and change detection
- Map projection and datum
- Data collection methods
- Spatial data management
- Data integration and alignment
- Map drawing and presentation

Geodetic Surveying

- Principles of geodesy
- Geodetic datums and coordinate systems
- Global Navigation Satellite Systems
- Global geodetic reference systems
- High order measurements and corrections
- Network adjustment and transformation
- Geodetic control design and establishment

Hydrographic Surveying

- Marine geodesy
- Sounding surveys
- Satellite positioning and navigation
- Hydrographic instrumentation and calibration
- Marine charting
- Maritime boundaries
- Local and international laws of the sea.

Photogrammetry and Remote Sensing

- P&RS principles and technologies
- Sensor types and platforms
- Image orientations and aerial triangulation
- Data extraction and manipulation
- Photogrammetric mapping and measurements
- Geo-referencing and ortho-rectification
- Photo-interpretation
- Close range photogrammetry

Mapping and Cartography

- Map datum and projection
- Map design and production
- Mapping specification
- Mapping data collection and compilation
- Map data management
- Cartographic presentation
- Cartographic materials and reproduction methods

Geographic Information System

- Principles of geographic information science and systems
- Geo-spatial data standards
- System design and data modelling
- Data quality and assessment
- Data manipulation and analysis
- Industrial software packages
- GIS applications

Utility Surveying

- Project management and engineering practice
- Detail and as-built surveys
- Buried object positioning methodology
- Visualisation and Modelling
- Data interpretation and analysis
- Data management and retrieval
- Utility related legislations
- Site safety and management

- END -