THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Department of Building and Real Estate

Higher Diploma

in

Building Technology and Management (Engineering)

Building Technology and Management (Surveying)

Programme Code: 32372-ENG & 32372-SUR

PROGRAMME REQUIREMENT DOCUMENT

(For 2021/2022 cohort)

September 2021

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

This document should be read in conjunction with the AR Handbook on Academic Regulations and Procedures.

Department of Building and Real Estate
Faculty of Construction and Environment

September 2021

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1. Introduction and General Information

The Higher Diploma in Building Technology and Management (HDBTM) of BRE has been operating since 1974, first as a 3-year full-time programme, and then redesigned as a 2-year curriculum with respect to changes in entrance requirements on qualification over the years. Starting from 2002/2003, the intake of students to HDBTM has been divided into two distinct programmes: HDBTM in Engineering and HDBTM in Surveying.

The current 2-year full-time programmes using HKDSE result as main entrance requirements have been implemented since 2012/13 academic year. Starting from 2018/19, both HDBTM programmes comprise 63 credits plus 3 training credits.

Programme Title & Programme Code	Higher Diploma in Building Technology and Management (Engineering) 32372-ENG Higher Diploma in Building Technology and Management (Surveying) 32372-SUR
Mode of Study	Full-time
Duration	2 years (normal duration)
Credit Requirements for Graduation	63 Credits + 3 Training Credits
Host Department	Department of Building and Real Estate (BRE)
Contributing Departments	AMA, CLC, ELC, CEE, LSGI, IC

2. The Rationale, Programme Aims and Intended Learning Outcomes

2.1 Motto, Vision & Mission of the University

Our Motto

To learn and to apply, for the benefit of mankind

Our Vision

Be a leading university that advances and transfers knowledge, and provides the best holistic education for the benefit of Hong Kong, the nation and the world.

Our Mission

- To pursue impactful research that benefits the world.
- To nurture critical thinkers, effective communicators, innovative problem solvers and socially responsible global citizens.
- To foster a University community in which all members can excel in their aspirations with a strong sense of belonging and pride.

2.2 Institutional Outcomes of Higher Diploma Programmes of the University

Along with the mission statements of the University, a set of Learning Outcomes for Higher Diploma graduates at institutional level have been developed as below:

Competent Paraprofessional:	Graduates should be able to integrate and apply in practice the fundamental knowledge and skills required for functioning effectively as an entry-level paraprofessional.
Critical Thinker:	Graduates should be able to examine the validity of information, arguments, and different viewpoints, and reach a sound judgement on the basis of credible evidence and logical reasoning.
Effective Communicator:	Graduates should be able to comprehend and communicate effectively in English and Chinese, orally and in writing, in professional and daily contexts.
Practical Problem Solver:	Graduates should be able to identify and define problems in professional and daily contexts, and produce workable solutions to the problems.
Lifelong Learner:	Graduates should recognize the need for continual learning and self-development, and be able to plan, manage and improve their own learning for self-determined development goals.

Ethical Citizen:	Graduates should recognize their leadership potential in their own roles, and should acknowledge their responsibilities as paraprofessionals and citizens to the society and their own nation, and be able to demonstrate ethical reasoning in professional and daily contexts.

The HDBTM programmes has been designed and implemented to align with the institutional outcomes.

2.3 Vision and Mission Statement of the Department of Building and Real Estate

Vision of BRE

To become a world-class academic department in the construction and real estate field.

Mission of BRE

To achieve Academic Excellence in the context of construction and real estate.

2.4 Programme Mission Statement and Rationale

Higher diploma education in building and construction should be intrinsically associated with the industry, for which HDBTM will continue to serve. HDBTM is designed to provide a course of study which is not only academically rigorous but also provides the appropriate technical expertise in the production engineering discipline and surveying discipline, such that graduates are well prepared to play a proactive role within the construction industry.

HDBTM aims to provide fundamental education for students within an academic environment to develop their knowledge, skills, and abilities by application of the methods and practices involved in the evaluation, design, construction, and maintenance of buildings with underpinning studies of technologies, economics, law, management, and technology. The two programmes are designed for graduates to pursue their career development to become building engineering and surveying paraprofessionals or professionals for Hong Kong, the Mainland, and other international markets.

2.5 Programmes Education Objectives

The Programme Outcomes are evolved from the Programme Mission with its educational objectives whilst the Programme Outcomes direct the design of the programme curriculum and hence the subjects (courses) contained in the programme curriculum. Every subject (course) incorporates both the subject intended learning outcomes (ILOs) and the subject content of which is specifically designed for students learning be it with professional or complementary content. The intended learning outcomes of the different subjects (courses) are designed to achieve the programme outcomes at different levels of the subjects. It is a two-way inter-related activity/process on programme outcomes and curriculum design.

There are two categories of the programme outcomes namely **A, - Professional Academic Learning Outcomes with 5 outcomes**; and **B, - Attributes to all-roundedness with 6 outcomes**. The former focuses mainly on the discipline specific knowledge of the programme professional-wise and academic-wise whereas the latter focuses on the complimentary soft skills in general which are applicable to both disciplines specific as well as the daily social encounters. Consequently, these two categories of programme outcomes are learned through the various subjects (courses) in the curriculum, which then in turn achieve the programme educational objectives.

There are four educational objectives of the HDBTM programme to embrace both the professional and academic outcomes as well as the incorporation of the soft skills (all-rounded attributes). Such educational objectives are as follows:-

- To equip with appropriate technical expertise in the production of building and facilities.
- To be able to contribute effectively to project management teams.
- To be able to adapt to changing demands in the building engineering profession.
- To continue to develop in the building engineering profession.

2.6 Programmes Intended Learning Outcomes

The Intended Programme Outcomes refer to the intellectual abilities, knowledge, skills and attributes that an all-rounded preferred graduate from HDBTM programme should possess.

To ensure fulfillment of the goal of developing all-round students with professional competence stipulated by PolyU, it is required that the intended learning outcome statements encompass the following two categories of learning outcomes:

Category A Professional/academic knowledge and skills

Upon successful completion of the programme, the graduate is expected to action the following abilities:

A1. To possess the basic knowledge of the engineering principles, processes and methods for the successful completion of construction projects.

Measurement Dimensions

(1) An ability to possess knowledge of systematical basic engineering principles and construction technology for the successful completion of different types of construction projects.
(2) An ability to comprehend the basic knowledge of engineering principles and construction technology that provide practical bodies of knowledge for the accepted practices in construction engineering projects.
(3) An ability to understand and evaluate the basic process(es) of construction activities of a construction project.
(4) An ability to demonstrate the basic knowledge of engineering practice (technology) in the construction practice areas.

A2. To have a basic knowledge of construction management and operational practices required to support efficient building production.

Measurement Dimensions

(1) An ability to apply basic engineering management for building construction activities.
(2) An ability to apply quality, safety and environmental management in building production.
(3) An ability to apprehend planning and programming techniques for managing building construction activities.

A3. To be able to identify, analyze, and solve engineering problems arising from the construction operation.

Measurement Dimensions

(1) An ability to identify problems in construction.
(2) An ability to present the construction problems being identified propose appropriate solutions.
(3) An ability to apply engineering principles and construction technology to propose solutions for solving the identified technical construction problems.

A4. To be conversant with the specification, design, construction, control, and management that facilitates the successful completion of the production of building projects.

Measurement Dimensions

(1) An ability to understand the technical content of construction specifications.
(2) Ab ability to apprehend the characteristics and limitations of different construction designs, buildability and method statements.
(3) An ability to apply different construction procurement systems for building construction works.

A5. To appreciate the managerial, legal, social, and ethical responsibilities of a technician engineer employed in building production.

Measurement Dimensions

(1) An ability to understand the managerial, legal, social and ethical issues with technological considerations for the identified construction problems.
(2) An ability to appreciate the environmental considerations of the proposed solutions to the identified construction problems.

Category B Attributes for all-roundedness

Upon successful completion of the programme, the students are expected to possess the following attributes on all-roundedness:

B1. To possess skills to identify, analyze, and solve problems.

Measurement Dimensions

(1) An ability to identify issues and problems in construction/construction projects.
(2) An ability to propose solutions for the identified issues/problems in construction/construction projects taking into account of all affecting possibilities.

B2. To have an understanding of professional, social and ethical responsibilities.

Measurement Dimensions

(1) An ability to apprehend the implications of professional, social and ethical responsibilities while identifying issues and problems.
(2) An ability to import the considerations of professional, social and ethical responsibilities in proposing solutions/alternatives.
(3) An ability to show comprehension of the role of building technician engineer in society in identifying issues in construction practice: professional ethics for public safety and the impacts of such construction activities on economic, social, cultural and environmental aspects as well as on sustainability.

B3. To communicate effectively.

Measurement Dimensions

(1) An ability to communicate clearly coherently and effectively in both verbal and written instructions.
(2) An ability to comprehend and write clear and systematic report and design/management/process documentation on complex construction engineering activities.
(3) An ability to make concise and effective presentations to the clients, stakeholders, construction community and the society at large.
(4) An ability to demonstrate the different means of communication in clear and precise communication e.g. the use of IT, charts, graphs, statistics, diagrams and drawings, computer simulations, power point, video, etc. apart from writing.

B4. To reflect on knowledge gap for life time learning.

Measurement Dimensions

(1) An ability to show the recognition of needs in life-long learning in the changing tec1mological, environmental and social environment(s).
(2) An ability to engage in learning development independently.
(3) An ability to identify contemporary issues in knowledge for further enhancement.

B5. To contribute as an effective team member.

Measurement Dimensions

(1) An ability to show contributions and harmonious working in a group.
(2) An ability to demonstrate proactively in thinking as well as in actions within his/her responsible domain(s).
(3) An ability to function effectively in team/group work.

B6. To identify contemporary issues.

Measurement Dimensions

(1) An ability to identify the present construction issues at large.
(2) An ability to analyze and formulate such issues/problems to substantiate conclusions.

2.7 Mapping of Intended Learning Outcomes with Institutional Learning Outcomes

The mapping of the Intended Learning Outcomes (ILO) of the programme with the Institutional Learning Outcomes of the University is presented in the table below:

The approach on measuring the achievement of Intended Learning Outcomes of the programme will be covered in Section 8.

Mapping of Intended Learning Outcomes (ILOs) of the Higher Diploma in Building Technology & Management Programme and Institutional Learning Outcomes of PolyU

ILOs of HDBTM Programme (Category A)	Institutional Learning Outcomes (Higher Diploma Programmes)					
	Competent paraprofessional	Critical thinker	Effective communicator	Practical problem solver	Lifelong learner	Ethical citizen
A1	✓			✓	✓	
A2	✓		✓	✓	✓	✓
A3	✓	✓	✓	✓	✓	
A4	✓	✓		✓	✓	✓
A5	✓	✓	✓	✓	✓	✓
ILOs of HDBTM Programme (Category B)	Competent paraprofessional	Critical thinker	Effective communicator	Practical problem solver	Lifelong learner	Ethical citizen
B1	✓	✓		✓		
B2	✓	✓	✓	✓	✓	✓
B3	✓		✓	✓		
B4	✓	✓		✓	✓	
B5	✓		✓	✓		✓
B6	✓	✓	✓	✓	✓	✓

3. The Curriculum Framework

HDBTM is a two-year full time programme comprises 63 credits plus 3 summer training credits with a mandatory summer term in between the 2 years. Within the 63 credits, there are 48 credits of Discipline Specific Requirements (DSR) subjects 15 credits of General University Requirements (GUR) subjects including 9 credits in GUR language subjects and 6 credits in Cluster Area Requirements (CAR) subjects. The inclusion of GUR subjects into the curriculum is in line with the General framework for Higher Diploma programmes offered by the PolyU and also align with other Higher Diploma programmes offered by the Faculty of Construction and Environment (The PolyU curriculum framework for Higher Diploma programmes is shown as below for reference).

Minimum credit requirement for graduation		60 credits
General University Requirements	15-18 credits	
Discipline-Specific Requirements	42-57credits	
Maximum credits allowed without incurring a higher tuition fee		75 credits

HDBTM comprises two distinct programmes, namely HDBTM in Engineering and HDBTM in Surveying. The two programmes share some common subjects in both years while specific subject groups for corresponding disciplines are included to provide students to pursue specific professional discipline. There is a mechanism to allow a small number of students to change programme via transfer of study in year one. Every application for transfer of study has to be supported with justifications and shall be subject to the approval by the Programme Leader.

4. Curriculum Structure and Progression Pattern

Curriculum and General Progress Pattern

Progression Pattern (2021/2022)					Building Surveying (BS)	Quantity Surveying (QS)	General Practice Surveying (GP)
Higher Diploma in Building Technology and Management (32372)							
Stage 1 (Year 1)							
	Semester 1 (13weeks)	**Eng.**	**Sur.**	**Remarks**			
GUR	LCR subject 1	3	3	GUR Subject			
GUR	LCR subject 2	3	3				
GUR	CAR subject 1	3	3				
BRE222	Workshop Practice & Draftsmanship	1.5	1.5	Tailor-made for HDBTM			
AMA1110	Basic Mathematics I	3	3	Common subject with undergraduate programmes			
BRE258	Industrial Safety I	1	1				
CSE20290	Introduction to Geotechnology	3					
	Sub-total credits	**17.5**	**14.5**				
	Semester 2 (13 weeks)						
GUR	LCR subject 3	3	3	GUR Subject			
BRE206	The Legal Context of Construction & Real Estate		3	Common subject with undergraduate programmes			
BRE2031	Environmental Science	3	3				
BRE263	Construction Economics & Finance	3	3				
BRE210	Information and Data Analysis	3	3	Tailor-made for HDBTM			
BRE222	Workshop Practice & Draftsmanship	1.5	1.5				
	Sub-total credits	**13.5**	**16.5**				
	Stage 1 Total Credits	**31**	**31**				
	Summer Semester (7 weeks)						
BRE274	Workshop Training and Building Information Modelling	**3**	**3**	Training Credits			

Stage 2 (Year 2)							
	Semester 1 (13weeks)	**Eng.**	**Sur.**	**Remarks**			
GUR	CAR Subject 2	3	3	GUR Subject			
BRE265	Introductory Construction Technology & Materials	3	3	Common subject with undergraduate programmes			
BRE349	Building Services I	3	3				
BRE315	Property Valuation		3				√
ELC3421	English for Construction and Environmental Professionals	3	3				
BRE271	Measurement & Estimating	3	3	Tailor-made for HDBTM			
	Sub-total credits	**15**	**15/18**				
	Semester 2 (13 weeks)						
BRE262	Project Studio	3	3	Common subject with undergraduate programmes			
LSGI2961	Engineering Surveying	3					
BRE217	Planning & Development		3				
BRE337	Property Law		3				√
BRE272	Project Supervision & Contract Administration	3	3	Tailor-made for HDBTM	√	√	
BRE273	Construction and Maintenance Technology	3	3		√	√	
BRE275	Individual & Integrated Project	5	5				
	Sub-total credits	**17**	**14/17**				
	Stage 2 Total Credits	**32**	**32**				
	Total Programme Credits	**63**	**63**				
	Training Credits	**3**	**3**				
				Total Credits for Specific Surveying Discipline	6	6	6
					BS	**QS**	**GP**

Note: The schedule on CAR subjects are indicative only as students are free to decide at which semesters to enroll and complete the two CAR subjects (6 credits) as stipulated in the curriculum.

5. Entrance Requirements

5.1 The HDBTM programmes admit students via the JUPAS and non-JUPAS routes. The minimum entrance requirements of HDBTM for JUPAS applicants are in line with the general PolyU requirement for higher diploma programmes. There are no specific preferred subjects for HDBTM and the other entrance requirements are in line with the admission policies of BRE and FCE (English has been set as preferred subjects by the University for all undergraduate and sub-degree programmes). For non-JUPAS applications, normally the study history of applicants will be assessed on a case-by-case basis.

5.2 The General Entrance Requirements for Higher Diploma offered by the University are as below:-

For JUPAS applicants

Candidates applying with Hong Kong Diploma Secondary Education (HKDSE) or equivalent. Level 2 in 5 HKDSE subjects including English Language and Chinese Language

Relevant Applied Learning subjects that can be considered for meeting the University entrance requirement and admission score calculation for HDBTM:

Building Technology

For non-JUPAS applicants

For those who are applying on the basis of A-Level qualifications:

- E in one A-Level subject or E in two AS-Level subjects;

AND

- Satisfy the English Language Requirement set by the University.

For those who are applying on the basis of other qualifications:

Applicants seeking admission on the basis of other qualifications will be considered on a case-by-case basis.

6. Programme Operation and Management

Subject Delivery

6.1 Subjects are normally offered once a year in a pre-determined semester. Most of the subjects listed in the programme will be offered in the daytime. Usually, there will be no summer term teaching (except BRE274 operated by IC for all students in the summer of year 1 and GUR subjects enrolled by individual students).

Subject Registration and Withdrawal

6.2 In addition to programme registration, students need to register for the subjects at specified periods prior to the commencement of the semester. Students may apply for withdrawal of their registration on a subject after add/drop period if they have a genuine need to do so. The application should be made to the relevant programme offering Department and will require the approval of both the subject lecturer and the Programme Leader concerned. Application submitted after the commencement of the examination period will not be considered. For approved applications of subject withdrawal, the tuition fee paid for the subject will be forfeited and the withdrawal status of the subject will be shown in the examination result notification and transcript of studies but will not be counted towards the calculation of GPA.

Study Load

6.3 For students following the progression pattern specified for their programme, they have to take the number of credits and subjects as specified in this document for each semester. Students cannot drop the subjects assigned by the Department unless prior approval has been granted by the subject lecturer in charge and the Department.

6.4 The normal study load ranges from 15 to 18 credits in a semester. The maximum study load to be taken by a student in a semester is 21 credits. Special approval by the Head of the Programme offering Department is necessary should a student plans to take beyond 21 credits in one semester. For such cases, students should be reminded that the study load approved should not be taken as grounds for academic appeal.

6.5. To help improving the academic performance of students on academic probation (Section 7.15), these students will be required to take a reduced study load in the following semester (Summer Term excluded). The maximum number of credits to be taken by the students under probation has been set at 15 credits.

6.6 Students are not generally allowed to take zero subject in any semester, including the mandatory summer term as required by some programmes, unless they have obtained prior approval from the Award Coordinator; otherwise, they will be classified as having unofficially withdrawal from their programme of study. Students who have been approved for zero subject enrolment (i.e. taking zero subject in a semester) are allowed to retain their student status and continue to use campus and library facilities. Any semesters in which students are allowed zero subjects enrollment will be counted towards the maximum period of registration. Students will be responsible for ensuring that they complete their programme of study within the maximum period of registration.

Subject Exemption

6.7 Students may be exempted from taking any specified subjects, including mandatory General University Requirements (GUR) subjects, if they have successfully completed similar subjects previously in another programme or have demonstrated the level of proficiency/ability to the satisfaction of the subject offering Department. Subject exemption is normally decided by the subject offering Department. However, for applications which are submitted by students who have completed an approved student exchange programme, the subject exemption is to be decided by the programme offering Department in consultation with the subject offering Departments. If students are exempted from taking a specified subject, the credits associated with the exempted subject will not be counted towards meeting the award requirements (except for exemptions granted at admission stage). It will therefore be necessary for the students to consult the programme offering Department and take another subject in order to satisfy the credit requirement for the award.

Credit Transfer

6.8 Students may be given credits for recognized previous studies including mandatory General University Requirements (GUR) subjects; and the credits will be counted towards meeting the requirements for award. Transferred credits may be counted towards more than one award. The granting of credit transfer is a matter of academic judgment.

6.9 Credit transfer may be done with or without the grade being carried over; the former should normally be used when the credits were gained from PolyU. Credit transfer with the grade being carried over may be granted for subjects taken from outside the University, if deemed appropriate, and with due consideration to the academic equivalence of the subjects concerned and the comparability of the grading systems adopted by the University and the other approved institutions. Subject credit transfer is normally decided by the subject offering Department. However, for applications which are submitted by students who have completed an approved student exchange programme, the decision will be made by the programme offering Department in consultation with the subject offering Departments.

6.10 The validity period of credits previously earned is up to 8 years after the year of attainment.

6.11 Normally, not more than 50% of the credit requirement for award may be transferable from approved institutions outside the University. For transfer of credits from programmes offered by PolyU, normally not more than 67% of the credit requirement for award can be transferred. In cases where both types of credits are being transferred (i.e. from programmes offered by PolyU and from approved institutions outside the University), not more than 50% of the credit requirement for award may be transferred.

6.12 If a student is waived from a particular stage of study on the basis of advanced qualifications held at the time of admission, the student concerned will be required to complete fewer credits for award. For these students, the ‘deducted’ credits at the admission stage will be counted towards the maximum limit for credit transfer when students apply for further credit transfer after their admission.

6.13 All credit transfers approved will take effect only in the semester for which they are approved. A student who applies for transfer of credits during the re-enrolment or the add/drop period of a particular semester will only be eligible for graduation at the end of that semester, even if the granting of credit transfer will immediately enable the student to satisfy the credit requirement for the award.

6.14 For credit transfer of retaken subjects, the grade attained in the last attempt should be taken in the case of credit transfer with grade being carried over. Students applying for credit transfer for a subject taken in other institutions are required to declare that the subject grade used for claiming credit transfer was attained in the last attempt of the subject in their previous studies. If a student fails in the last attempt of a retaken subject, no credit transfer should be granted, despite the fact that the student may have attained a pass grade for the subject in the earlier attempts.

6.15 Students should not be granted credit transfer for a subject, which they have attempted and failed in their current study.

Deferment of Study

6.16 Students may apply for deferment of study if they have a genuine need to do so such as illness or posting to work outside Hong Kong. Approval from the Department is required. The deferment period will not count towards the maximum period of registration.

Registration Period

6.17 Subjects within the programme will be offered often enough to enable students entering the programme with the minimum admission requirements and undertaking the normal study pattern to complete the award requirements within the normal duration of 2 years.

Compulsory Graduation

6.18 As soon as students have satisfied the criteria for graduation as stipulated by the programme, they will be required to graduate.

Departmental Undergraduate Programme Committee

6.19 The Head of Department can decide on the composition of the Departmental Undergraduate Programme Committee. The Departmental Undergraduate Programme Committee will meet at least twice a year, and additional meeting may be convened at the request of the Chairman or of one-third of its membership or of the Chairman of the Senate. It will exercise the overall academic and operational responsibility for the programme and its development within defined policies, procedures and regulations.

6.20 The Committee will be specifically responsible for the following:-

i. planning, organization and development of the programme;
ii. stimulation of the development of teaching methods and programme materials, through Heads of Departments, Theme Group Leaders, and the Educational Development Centre, as appropriate;
iii. to review academic regulations, admission policy, and assessment methods;
iv. to prepare formal submissions to appropriate professional bodies, normally via the Head of the host Department and in accord with the University's established procedures;
v. continuous critical review of the rationale, aims, intended learning outcomes (ILOs) and the alignment of teaching, learning and assessment with the ILOs, programme learning outcomes assessment and its results, and the improvement and development of the programme(s);
vi. define and maintain the academic standard of the programmes;
vii. to ensure that the views of students and other key stakeholders on the programme are known and taken into account;
viii. evaluation of the operation, health and progress of the programme as defined in the University's programme review procedures.

Programme Management Committee

6.21 The programme management and operation of HDBTM shall follow the PolyU's and *"Academic Regulations for 2-year Higher Diploma Programmes"* and *"Guidelines and Regulations for Programme Planning, Validation and Management"*. The Departmental Programme Committee for the HDBTM will exercise the overall academic and operational responsibility for the programme and its/their development within defined policies, procedures and regulations. The composition of the Programme Committee shall comprise of the Programme Leader (as Chairman), Deputy Programme Leader and Programme Counsellor(s). The Departmental Programme Committee(s) will meet at least twice a year. Extra meeting(s) will be convened at the request of the Chairman or of one-third of its membership or of the Chairman of the Senate. The Award Coordinator will be a standing member of the Departmental Undergraduate Programme Committee.

Student / Staff Consultative Group

6.22 The importance of soliciting students' opinions on the organization and operation of the programme on a continual basis is recognized and formal arrangements for this purpose are in place. The Group should comprises students and staff. Student membership should include all years of study under the normal progression pattern and other major student groupings (if any), and that staff membership be in the programme management team. A member of staff may chair the Group. The Group is to discuss any matters directly related to the programme, and to report or make recommendations, as deemed necessary, to the Departmental Undergraduate Programme Committee. Meetings are usually held once per semester.

6.23 It is important that students should not perceive meetings of this Group as sole channel for dealing with student problems. Such matters would be dealt with whenever occurred, through the Award Coordinator or other appropriate staff. This would allow meetings of the Group to focus on constructive discussion of the programme operation and curriculum design, and of the demands of the programme on students.

7. Examination and Assessment

General Assessment Regulations (GAR)

7.1 These General Assessment Regulations shall govern the HDBTM programmes. Specific assessment regulations are set out here, having been developed within the framework of the GAR.

Students' progress by credit accumulation, i.e. credits earned by passing individual subjects are to be accumulated and counted towards the final award.

Assessment Methods

7.2 Different assessment methods including formative and summative assessments are adopted as deemed appropriate to the subjects depending on the natures of the subject disciplines and the alignment of the intend learning outcomes of the courses. The assessment methods are contained therein in the subject specifications, which can be referred to at the website of the Department (www.bre.polyu.edu.hk) and are distributed to all students in the beginning of the academic year. It is also reinforced by the subject lecturers by informing the students at the commencement of semesters on the assessment modes, standards and criteria.

7.3 Along with the adoption of criterion-referenced assessment and outcome-based approach, rubrics are developed to assess student performance with a scoring scale. Students work is evaluated against the pre-set scoring standards/criteria. The performance of students in respective aspects can be thus assessed according to the specified criteria and intended learning outcomes of the subjects.

7.4 In general, the student performance in each subject is assessed by a combination of coursework and examination. Weightings are allocated to coursework and examination of a subject respectively. Coursework may include assignments, case studies, seminar/tutorial presentation, role-playing, fieldwork, tests and other forms of learning activities. Grades will be assigned to reflect both individual contribution and group effort in the case it is not an individual piece of work. Examination (if adopted) is an end of unit/subject assessment. Grades are usually awarded to the written examinations. Marking schemes are provided to ensure assessment and grading on student performance are based on criteria and standards. The quality of examination papers and marking schemes is scrutinized by the external examiners and departmental academic advisor.

7.5 Students' performance in a subject is assessed by either of the following methods:-

(a) Coursework only: To pass a subject by this method of assessment, a student must attain a minimum Grade 'D' in coursework (tests, assignments, projects, laboratory work, field exercises, presentations and other forms of classroom participation).

(b) Examination and Coursework (the weighting of each component is stated in the Subject Portfolio): To pass a subject by adopting this method of assessment a student must attain a minimum Grade 'D' in coursework and a minimum Grade 'D' in the examination.

(c) Continuous Assessment: Project-based subjects are of this type of assessment where students are assessed through a period of time with stages of work and progress together with the final products of works.

Grading

7.6 Assessment grades shall be awarded on a criterion-referenced basis. A student's overall performance in a subject (including GUR subjects) shall be graded as follows:

Subject Grade	***Short Description***	***Elaboration on subject grading description***
A+ A A-	Excellent	Demonstrates excellent achievement of intended subject learning outcomes by being able to skilfully use concepts and solve complex problems. Shows evidence of innovative and critical thinking in unfamiliar situations, and is able to express the synthesis or application of ideas in a logical and comprehensive manner.
B+ B B-	Good	Demonstrates good achievement of intended subject learning outcomes by being able to use appropriate concepts, and solve problems. Shows the ability to analyse issues critically and make well-grounded judgements in familiar or standard situations, and is able to express the synthesis or application of ideas in a logical and comprehensive manner.
C+ C C-	Satisfactory	Demonstrates satisfactory achievement of intended subject learning outcomes by being able to solve relatively simple problems. Shows some capacity for analysis and making judgements in a variety of familiar and standard situations, and is able to express the synthesis or application of ideas in a manner that is generally logical but fragmented.
D+ D	Pass	Demonstrates marginal achievement of intended subject learning outcomes by being able to solve relatively simple problems. Can make basic comparisons, connections and judgements and express the ideas learnt in the subject, though there are frequent breakdowns in logic and clarity.
F	Fail	Demonstrates inadequate achievement of intended subject learning outcomes through a lack of knowledge and/or understanding of the subject matter. Evidence of analysis is often irrelevant or incomplete.

Note:
- Marking rubrics aligned with these Grade Descriptors need not include all aspects of the grade descriptor.
- Marking rubrics aligned with these Grade Descriptors may include other aspects aligned with particular subject matter or field of study requirements but are not included in the grade descriptor.

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

The grade points assigned to subject grades attained by students are as follows:

Grade	New Grade Point	Short Description
A+	4.3	Excellent
A	4.0	
A-	3.7	
B+	3.3	Good
B	3.0	
B-	2.7	
C+	2.3	Satisfactory
C	2.0	
C-	1.7	
D+	1.3	Pass
D	1.0	
F	0.0	Failure

Weighted GPA will be computed as follows:-

$$\text{Weighted GPA} = \frac{\sum_{n=1}^{N} \text{Subject Grade Point}_n \times \text{Subject Credit Value}_n \times W_n}{\sum_{n=1}^{N} \text{Subject Credit Value}_n \times W_n}$$

where W_n = weighting to be assigned according to the level of the subject

N = number of all subjects counted in GPA calculation as set out in Section 7.7 - 7.9, except those exclusions specified in Section 7.26.

For calculating the Weighted GPA (and award GPA) to determine the Honours classification of students who satisfy the graduation requirements of Bachelor's degree awards, a University-wide standard weighting[1] will be applied to all subjects of the same level, with a weighting of 2 for Level 1 and 2 subjects, a weighting of 3 for Level 3 and 4 subjects. Same as for GPA, Weighted GPA ranges from 0.00 to 4.30 from 2020/21.

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

$$\text{GPA} = \frac{\sum_{n=1}^{N} \text{Subject Grade Point}_n \times \text{Subject Credit Value}_n}{\sum_{n=1}^{N} \text{Subject Credit Value}_n}$$

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

[1] Requests for deviation from this University-wide standard require specific approval by the APRC.

7.8 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 have been approved, but without any grade assigned[1]
(v) Subjects from which a student have been allowed to withdraw (i.e. those with the grade 'W')

7.9 Subject which has been given an "S" code, i.e. absent from assessment, 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 reference point of time. GPA is an indicator of overall performance, and ranges from 0.00 to 4.30 from 2020/21.

Types of GPA

7.10 GPA will be calculated for each Semester including the Summer Term. This Semester GPA will be used to determine students' eligibility to progress to the next Semester alongside with the 'cumulative GPA'. However, the Semester GPA calculated for the Summer Term will not be used for this purpose, unless the Summer Term study is mandatory for all students of the programme concerned and constitutes part of the graduation requirements.

7.11 The GPA calculated after the second Semester of the students' study is therefore a "Cumulative' GPA" of all the subjects taken so far by students, and without applying any level weighting.

7.12 Along with the 'Cumulative' GPA, a "Weighted GPA" will also be calculated, to give an indication to the Board of Examiners on the award classification, which a student will likely get if he makes steady progress on his/her academic studies.

7.13 When a student has satisfied the requirements for award, an "Award GPA" will be calculated to determine his/her award classification.

[1] Subjects taken in PolyU or elsewhere and with grades assigned, and for which credit transfer has been approved, will be included in the GPA calculation.

Progression/Academic Probation/De-registration

7.14 The Board of Examiners shall, at the end of each semester (except for Summer Term unless there are students who are eligible to graduate after completion of Summer Term subjects or the Summer Term study is mandatory for the programme), determine whether each student is:-

i. eligible for progression towards an award; or
ii. eligible for an award; or
ii. required to be de-registered from the programme.

7.15 When a student has a Grade Point Average (GPA) lower than 1.70, he will be put on academic probation in the following semester. If a student is able to pull his GPA up to 1.70 or above at the end of the semester, the status of "academic probation" will be lifted. The status of "academic probation" will be reflected in the assessment result notification but not in the transcript of studies.

7.16 A student will have 'progressing' status unless he falls within any one of the following categories which shall be regarded as grounds for de-registration from the programme:-

i. the student has reached the final year of the normal period of registration for that programme, as specified in the Programme Requirement Document, unless approval has been given for extension; or
ii. the student has reached the maximum number of retakes allowed for a failed compulsory subject; or
iii. the student's GPA is lower than 1.70 for two consecutive semesters and his Semester GPA in the second semester is also lower than 1.70; or
iv. the student's GPA is lower than 1.70 for three consecutive semesters.

7.17 When a student falls within any of the categories as stipulated above, except for category (i) with approval for extension, the Board of Examiners shall de-register the student from the programme without exception.

7.18 A student may be de-registered from the programme enrolled before the time frame specified in 7.16 if the academic performance is poor to the extent that the Board of Examiners deems that his chance of attaining a GPA of 1.70 at the end of the programme is slim or impossible.

7.19 If the student is not satisfied with the de-registration decision of the Board of Examiners, he can lodge an appeal. All such appeal cases will be referred directly to Academic Appeals Committee (AAC) for final decision. Views of Faculties/Schools/Department will be sought and made available to AAC for reference.

University Graduation Requirements

7.20 With effect from the 2020/21 academic year, a student in HDBTM is eligible for award if he/she satisfies all the conditions listed below:-

i. Complete successfully an accumulation of 63 credits + 3 training credits for the captioned programme as defined in the programme requirement document;

ii. Satisfy 15 credits General University Requirements for Higher Diploma programme (HDGUR), in which 3 credits for Cluster Area Requirement (CAR) should fulfill the "China-related" requirements;
iii. Earn a Cumulative GPA (Award GPA) of 1.70 or above at graduation;
iv. Satisfy any other requirements as specified in the programme requirement document and as specified by the University.

7.21 There are subjects which are designed to fulfill the credit requirement of different types of subject. Students passing these subjects will be regarded as having fulfilled the credit requirements of the particular types of subject concerned. Nevertheless, the subject passed will only be counted once in fulfilling the credit requirements of the award, and the students will be required to take another subject in order to meet the total credit requirement of the programme concerned.

7.22 Remedial and underpinning subjects are designed for new students who are in need of additional preparations in a particular subject area, and only identified students of a programme are required to take these subjects. These subjects should therefore be counted outside the regular credit requirement for award.

Guidelines on Award Classification

7.23 To assist the Board of Examiners in arriving at award classification decisions, a weighted GPA will be computed for each student upon completion of the programme.

Weighted GPA will be computed as follows:-

$$\text{Weighted GPA} = \frac{\sum_{n=1}^{N} \text{Subject Grade Point}_n \times \text{Subject Credit Value}_n \times W_n}{\sum_{n=1}^{N} \text{Subject Credit Value}_n \times W_n}$$

where W_n = weighting to be assigned according to the level of the subject

N = number of all subjects counted in GPA calculation as set out in Section 7.7 - 7.9, except those exclusions specified in Section 7.26.

7.24 The weighting of each level is a measure of the relevance of the level to the classification of the award. Same as GPA, weighted GPA ranges from 0.00 to 4.30 from 2020/21.

7.25 The contribution of each subject towards the weighted GPA depends on the product of the credits assigned and the level weighting. The weighted GPA will be used as one of the factors to be considered by the Board of Examiners in the determination of the award classifications. For Higher Diploma curriculum, the weighting of all subjects in the curriculum is equal.

7.26 Any subjects passed after the graduation requirement has been met will <u>not</u> be taken into account of in the grade point calculation for award classification.

Classification of Awards

7.27 The following are guidelines for Board of Examiners' reference in determining award classifications:-

Classification	**Guidelines**
Distinction	The student's performance/attainment is **outstanding**, and identifies him/her as **exceptionally able** in the field covered by the programme in question.
Credit	The student has reached a standard of performance which is **more than satisfactory** but **less than outstanding**.
Pass	The student has attained the 'essential minimum' required for graduation as a standard ranging from **just adequate to satisfactory.**

The following table indicates the ranges of award GPA for determining award classifications:

Honours classification	**All other programmes**	**Award GPA**
1st	Distinction	3.60 – 4.30
2:i	Credit	3.00 – 3.59
2:ii	Pass	2.40 – 2.99
3rd		1.70 – 2.39

7.28 Students who have committed academic dishonesty will be subject to the penalty of the lowering of award classification by one level. The minimum of downgraded overall result will be kept at a Pass. In rare circumstances where both the Student Discipline Committee and Board of Examiners of a department consider that there are strong justifications showing the offence be less serious, the requirement for lowering the award classification can be waived.

Retaking of Subjects

7.29 Students may only retake a subject which they have failed (i.e. Grade F or U). Retaking of subjects is with the condition that the maximum study load of 21 credits per semester is not exceeded.

7.30 The number of retakes of a subject should be restricted to two, i.e. a maximum of three attempts for each subject is allowed[1].

7.31 Students need to submit a request to the Faculty/School Board for the second retake of a failed subject.

7.32 Students who have failed a compulsory subject after two retakes and have been de-registered can submit an appeal to the AAC for a third chance of retaking the subject.

7.33 In case AAC does not approve further retakes of a failed compulsory subject or the taking of an equivalent subject with special approval from the Faculty, the student concerned would be de-registered and the decision of the AAC would be final within the University.

Absence from an Assessment Component

7.34 If a student is unable to complete all the assessment components of a subject, due to illness or other circumstances which are beyond his/her control and considered by the subject offering department as legitimate, the Department will determine whether the student will have to complete a late assessment and, if so, by what means. This late assessment shall take place at the earliest opportunity, and before the commencement of the following academic year (except that for Summer Term, which may take place within 3 weeks after the finalization of Summer Term results). If the late assessment cannot be completed before the commencement of the following academic year, the Faculty Board Chairman shall decide on an appropriate time for completion of the late assessment.

7.35 The student concerned is required to submit his/her application for late assessment in writing to the Head of Department offering the subject, with five working days from the date of the examination, together with any supporting documents. Approval of applications for late assessment and the means for such late assessments shall be given by the Head of Department offering the subject or the Subject Lecturer concerned, in consultation with the Award Coordinator.

Assessment to be Completed

7.36 For cases where students fail marginally in one of the components within a subject, the BoE can defer making a final decision until the students concerned have completed the necessary remedial work to the satisfaction of the subject examiner(s). The remedial work must not take the form of re-examination.

[1] The retake count of students admitted in or before 2019/20 will be reset to "0" in 2020/21 when the revised regulations come into effect.

Other Particular Circumstances

7.37 A student's particular circumstances may influence the procedures for assessment but not the standard of performance expected in assessment.

Aegrotat Award

7.38 If a student is unable to complete the requirements of the programme in question the award, due to very serious illness, or other very special circumstances which are beyond his/her control, and are considered by the Board of Examiners as legitimate, the Faculty Board will determine whether the student will be granted aegrotat award. Aegrotat award will be granted under very exceptional circumstances.

7.39 A student who has been offered an aegrotat award shall have the right to choose either to accept such an award or request to be assessed on another occasion as stipulated by the Board of Examiners, the student's exercise of this option shall be irrevocable. The acceptance of an aegrotat award by a student shall disqualify him/her from any subsequent assessment for the same award. An aegrotat award shall normally not be classified, and the award parchment shall not state that it is an aegrotat award. However, the Board of Examiners may determine whether the award should be classified provided they have adequate information on the students' academic performance.

Recording of Disciplinary Actions in Student Records

7.40 With effect from Semester One of 2015/16, disciplinary actions against students' misconducts will be recorded in students' records.

7.41 Students who are found guilty of academic dishonesty will be subject to the penalty of having the subject result concerned disqualified and be given a failure grade with a remark denoting 'Disqualification of result due to academic dishonesty'. The remark will be shown in the students' record as well as the assessment result notification and transcript of studies, until their leaving the University.

7.42 Students who have committed disciplinary offences (covering both academic and non-academic related matters) will be put on 'disciplinary probation'. The status of 'disciplinary probation' will be shown in the students' record as well as the assessment result notification, transcript of studies and testimonial during the probation period, until their leaving the University. The disciplinary probation is normally one year unless otherwise decided by the Student Discipline Committee.

7.43 The University reserves the right to withhold the issuance of any certificate of study to a student who has unsettled matters with the University, or subject to disciplinary action.

8. Curriculum Mapping on Programme Learning Outcomes

8.1 Mapping of Curriculum with Programme Learning Outcomes

The matrix or curriculum map in the following tables give a holistic view of the degree to which each intended learning outcome will be taught and measured/assessed in the programme.

The level of attainment of learning outcomes has been classified into three levels, namely
- Introduced (I)
- Reinforced (R)
- Assessed (A)

These indicators (I, R, A) are employed in the tables below to demonstrate the attainment of the programme outcome through subjects (Disciplinary Specific Subjects only) in the HDBTM curriculum.

Disciplinary Specific Subjects in the HDBTM Curriculum

Subjects offered by the Department of Building and Real Estate

Subject Code	Subject Title
BRE2031	Environmental Science
BRE206	The Legal Context of Construction and Real Estate
BRE210	Information and Data Analysis
BRE217	Planning and Development
BRE222	Workshop Practice and Draftsmanship
BRE258	Industrial Safety I
BRE262	Project Studio
BRE263	Construction Economics and Finance
BRE265	Introductory Construction Technology and Materials
BRE271	Measurement and Estimation
BRE272	Project Supervision and Contract Administration
BRE273	Construction and Maintenance Technology
BRE274	Work Training and Building Information Modelling
BRE275	Individual and Integrated Project
BRE315	Property Valuation
BRE337	Property Law
BRE349	Building Services I

Subjects offered by Servicing Departments

Subject Code	Subject Title
AMA1110	Basic Mathematics I
CSE20290	Introduction to Geotechnology
LSGI2961	Engineering Surveying
ELC3421	English for Construction & Environment Professionals

Subjects offered by the Department of Building and Real Estate

	Programme Outcomes ***(Professional /Academic Knowledge and Skills)***	BRE2031 Environmental Science	BRE206 The Legal Context of CRE	BRE210 Information & Data Analysis	BRE217 Planning & Development	BRE222 Workshop Practice & Draftsmanship	BRE258 Industrial Safety I	BRE262 Project Studio	BRE263 Construction Economics & Finance	BRE265 Introductory Construction	BRE271 Measurement & Estimation	BRE272 Project Supervision & Contract Admin	BRE273 Const. & Maintenance Tech.	BRE274 Work Training & BIM	BRE275 Individual & Integ. Project	BRE 315 Property Valuation	BRE337 Property Law	BRE349 Building Services I
A(i)	To possess the basic knowledge of building engineering principles, processes and methods for the successful completion of all types of construction projects.	I A				I	I R			I A			R A					R A
A(ii)	To have a basic knowledge of construction management and operational practices required to support efficient building production.	I A		I R	I A		I R A			I A	I A	I R	R A		R A	I	I	
A(iii)	To be able to identify, analyse, and solve building engineering problems arising from construction operation.		A	A				I A				A		R A	R A			R A
A(iv)	To be conversant with the specification, design, construction, control, and management that facilities the successful completion of the production of building projects.	I	I A		I	I A			I A	I	I A					I	I	I A
A(v)	To appreciate the managerial, legal, social, and ethical responsibilities of a technician engineer employed in building production.		I A		I A					I A	I	I R A		R A		I R A	I R A	

	Programme Outcomes ***(All-rounded Attributes)***	BRE2031 Environmental Science	BRE206 The Legal Context of CRE	BRE210 Information & Data Analysis	BRE217 Planning & Development	BRE222 Workshop Practice & Draftsmanship	BRE258 Industrial Safety I	BRE262 Project Studio	BRE263 Construction Economics & Finance	BRE265 Introductory Construction	BRE271 Measurement & Estimation	BRE272 Project Supervision & Contract Admin	BRE273 Const. & Maintenance Tech.	BRE274 Work Training & BIM	BRE275 Individual & Integ. Project	BRE315 Property Valuation	BRE337 Property Law	BRE349 Building Services I
B(i)	To possess skills to identify, analyse and solve problems.	I A	I	I			I R	I			I A	I A	I A		I R A	R A	R A	R A
B(ii)	To have an understanding of professional, social and ethical responsibilities.		I		I A			I A				R	R	I A		I	I	
B(iii)	To communicate effectively.	I A			I A	I A	I R A	I A	I A	I A	I A							R A
B(iv)	To reflect on knowledge gap for life time learning.		I A	I	I	I A		I A						R A	R A	I	I	I
B(v)	To contribute as team member effectively.	I A				I		I	I A	I A					R A	R A	R A	R A
B(vi)	To identify contemporary issues.		I		I A	I A	I	I A				A	A	R A		I	I	I

Subjects offered by Servicing Departments

	Programme Outcomes ***(Professional /Academic Knowledge and Skills)***	AMA1110 Basic Mathematics I	CSE20290 Introduction to Geotechnology	LSGI2961 Engineering Surveying	ELC3421 English for Construction & Environment
A(i)	To possess the basic knowledge of building engineering principles, processes and methods for the successful completion of all types of construction projects.		I A	I A	
A(ii)	To have a basic knowledge of construction management and operational practices required to support efficient building production.	I	I A	I A	
A(iii)	To be able to identify, analyse, and solve building engineering problems arising from construction operation.				
A(iv)	To be conversant with the specification, design, construction, control, and management that facilities the successful completion of the production of building projects.				
A(v)	To appreciate the managerial, legal, social, and ethical responsibilities of a technician engineer employed in building production.		I A	I A	I

	Programme Outcomes ***(All-rounded Attributes)***	AMA1110 Basic Mathematics I	CSE20290 Introduction to Geotechnology	LSGI2961 Engineering Surveying	ELC3421 English for Construction & Environment
B(i)	To possess skills to identify, analyse and solve problems.	I	I A	I A	
B(ii)	To have an understanding of professional, social and ethical responsibilities.				
B(iii)	To communicate effectively.			I	I R A
B(iv)	To reflect on knowledge gap for life time learning.				
B(v)	To contribute as team member effectively.				
B(vi)	To identify contemporary issues.			I	

8.2 Measurement of Attainment of Intended Learning Outcomes

The Programme (Learning Outcome Assessment Plan (LOAP) employs the P-LOAP forms to assess and report the learning outcome assessment results for the programme in the Annual Operation Plan (AOP) annually. The P-LOAP is to assess the attainment of programme desired learning outcomes via the curriculum (subjects/courses). If any serious issues or mis-match identified through the LOAP/AOP, both the curriculum and programme outcomes would need to be revisited for ratification and revision.

This process if necessary is usually undertaken by the Departmental Teaching and Learning Committee, Award Coordinator and the programme management team. Views and consents will be sought from subject leaders and subject lecturers through feedback report(s) on revising the programme curriculum and/or subject outcomes. Departmental Learning and teaching Committee will receive such report and the P-LOAP forms for quality control.

Selected subjects in the curriculum will be used for the annual assessment of the attainment of intended learning outcomes of the programme.

Subject Portfolio

Subject Code	Subject Title
BRE2031	Environmental Science
BRE206	The Legal Context of Construction and Real Estate
BRE210	Information and Data Analysis
BRE217	Planning and Development
BRE222	Workshop Practices and Draftsmanship
BRE258	Industrial Safety I
BRE262	Project Studio
BRE263	Construction Economics and Finance
BRE265	Introductory Construction Technology and Materials
BRE271	Measurement and Estimating
BRE272	Project Supervision and Contract Administration
BRE273	Construction and Maintenance Technology
BRE274	Work Training and Building Information Modelling (Summer Semester)
BRE275	Individual and Integrated Project
BRE315	Property Valuation
BRE337	Property Law
BRE349	Building Services I
AMA1110	Basic Mathematics I
CSE20290	Introduction to Geotechnology
ELC3421	English for Construction and Environmental Professionals
LSGI2961	Engineering Surveying

Subject Description Form

Subject Code	BRE2031
Subject Title	Environmental Science
Credit Value	3
Level	2
Pre-requisite / Co-requisite / Exclusion	Nil
Objectives	This subject is intended to: Equip students with a holistic understanding of the factors that contribute to the quality and performance of the built environment with respect to the technical knowledge learned in construction technology.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Understand the means of controlling the internal environment and provide standards of utility and comfort whilst utilizing principles of passive design to minimize the consumption of energy b. Review the causes of indoor air pollution and the means to provide a healthy environment. c. Consider the effect of building construction and operation on the environment and appraise the role of sustainable development in minimizing impact on the external environment – use of resources, waste generation, pollution.
Subject Synopsis/ Indicative Syllabus	**Brief Syllabus Content:** Man and heat, heat transfer mechanisms, conduction, convection, radiation, thermal comfort. Climate and shelter, classification, global mechanisms, climatic data, micro-climatic building design. Design variables for energy efficient design and thermal performance of a building. Passive and active thermal controls, heating, refrigerators, ventilation and air conditioning. Principles of light, electromagnetic radiation, vision, luminance, glare, natural lighting and artificial lighting. Principles of sound, noise, noise transfer, insulation, acoustic design. Basics of electricity and magnetism, generation and power supply.

Use of resources, energy efficiency, waste reduction, land use, damage to the environment, sustainable development.

Environment assessment.

Indoor air quality.

Experimental Work:

Environmental Science: 2 experiments each of 2 hours duration from the following list:-

1. Lamps – measurement of efficiency.
2. Visual environment - assessment of quality.
3. Light fittings - determination of intensity distribution.
4. Daylight – measurement of daylight factor.
5. Absorption - determination of sound absorption coefficient.
6. Oral environment - use of sound level meter to investigate.
7. Reverberation - measurement or reverberation time.
8. Thermal comfort - investigation using thermal comfort meter.
9. 'U' values - determination of 'U' value of a building element.
10. Thermal radiation - measurement of radiant temperature.

Teaching/Learning Methodology

Teaching periods will adopt a range of methods which could include lectures by staff, small group discussions, student presentations, project based and problem-solving tasks, laboratory and case study work. Where appropriate, the use of computer assisted learning techniques will be employed.

The intention is to create an environment that encourages active learning. Students will be encouraged to reflect on their learning activities to review what they have learned and to plan further action and activity.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c			
1. Coursework	40%	√	√	√			
2. Examination	60%	√	√	√			
Total	100%						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Examination and coursework will constitute the 60% and 40% of the overall work of the subject respectively. The coursework mark will be based on the assessments of assignments projects, presentations, peer-group critiques and in-class tests. Assessment methods are intended to ensure the students achieve the learning objectives set, and assist learning through constructive feedback.

Student Study Effort Expected	Class contact:	
	▪ Lectures	26 Hrs.
	▪ Tutorials including experiments	13 Hrs.
	Other student study effort:	
	▪ Independent Study	81 Hrs.
	Total student study effort	120 Hrs.
Reading List and References	**Reading List:** Burberry P. (1997) *Environment and Services*, Addision Wesley Longman. Langston, C. (Ed.) (1997) *Sustainable Practices: ESD and the Construction Industry*. Envirobook, Sydney Aus. Thomas, R. (Ed) (1996) *Environmental Design*, E & F N Spon, London & N.Y. Hyde, R. and Woods, P. (2000) *Climate Responsive Design*, E & F N Spon, London & N.Y. McMullan R. (1992) *Environmental Services in Building*. The MacMillan Press Ltd. Wathern P. (1990) *Environmental Impact Assessment, Theory and Practice*. Routledge **Supplementary:** BRE (various) *Digests and Current Papers*. Building Research Establishment, Garston, Watford, U.K. BSIRIA (1987) *Building Services Materials Handbook*, E & F N Spon, London & N.Y.	

Subject Description Form

Subject Code	BRE206
Subject Title	The Legal Context of Construction and Real Estate
Credit Value	3
Level	2
Pre-requisite / Co-requisite / Exclusion	Nil
Objectives	Enable students to evaluate important legal concepts within the context of the Hong Kong legal system and apply the same in the context of construction and real estate. Develop intellectual skills, with particular reference to analysis, reasoning and communication skills.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Understand and evaluate the basic concepts and principles of Hong Kong law. b. Apply the basic concepts, principles and remedies in the law of contract, law of property, and law of tort to the context of construction and real estate. c. Use the above knowledge and reasoning skills to solve legal problems out of factual situations. d. Reflect and review their legal knowledge in the societal context. e. Communicate effectively.
Subject Synopsis/ Indicative Syllabus	Hong Kong legal system, including: court system; case law; Basic Law. Legal reasoning, including: application of legal principles, analysis, problem-solving, and communication skills. Contract Law, including: general principles of contract, types of contracts; remedies. Tort Law, including: principles of tortuous liability, negligence, nuisance, trespass, occupier's liability, breach of statutory duties and remedies. Property Law, including: concept and classification of property and definition of land; estates. Dispute Resolution, including: mediation, arbitration and adjudication. PRC Law: introduction.
Teaching/Learning Methodology	The sequence of learning in this module is organized around topics with a pattern of active and interactive tasks which occur before, during and after class contact sessions. Each topic is structured as follows: preparation activity, learning activity, feedback, reflection and evaluation, action planning, and review activity, which serves as the next preparation activity. The teaching strategy involves phases through which students learn intellectual and academic skills necessary for legal study, in parallel with learning key concepts for later study:

Phase 1: Learning to indentify legal issues – Topic focus: understanding legal concepts and rules.

Phase 2: Learning how to apply legal knowledge – Topic focus: understanding and applying legal principles.

Phase 3: Critical Judgment Analysis – Topic focus: justifying conclusions.

Phase 4: Problem-solving – Topic focus: integrating learning.

The programme is developed though learning support groups, specially designed heuristics, reflection and self-assessment tasks.

The learning support groups facilitate small group activities, promote effective learning, develop higher order intellectual abilities, give peer group support for learning, and promote active involvement of students in their own learning.

Reflection exercises are designed to turn experience into learning. They help students assess strengths and weaknesses, and indentify remedial action.

Self-assessment tasks are one type of reflection exercise through which students may test out knowledge and understanding of legal concepts and rules, and the development of reasoning skills. Guidance on self – assessment will be distributed to each student. The primary objectives of formative self-assessment are self-learning; measurement of attainment of the learning outcome; and efficient and effective preparation for summative assessments.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c	d	e	
1. Coursework	30%	√	√	√	√	√	
2. Examination	70%	√	√	√	√		
Total	100%						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The Coursework project is to assess students' ability:

1. To organize themselves.
2. To organize fellow group members.
3. To coordinate selection of topics with others outside of your group.
4. To solve a problem or task that is given.
5. To be creative in discovering solutions to the problem or task [*i.e.*, "thinking outside the box"].
6. To use effectively the resources available to you in the library and on-line.

The presentations are expected to be substantial, in-depth and thorough review, integration and application of the legal materials taught over the course of the semester. The presentations are expected to be professional, well rehearsed, and completed within time, rather than haphazardly organized at the last minute.

	Furthermore, consideration will be given to the following criteria in assessing performance: content, creativity, enthusiasm/team spirit, interaction [between the group members as well as the audience] and presentation. The examination is intended to assess students' analytical and reasoning skills, *i.e.*, application of the learned legal material; simple memorization will not result in a passing grade. In sum, the examination will assess the students' understanding of the subject as demonstrated by application rather than the student's ability to regurgitate notes. Students will be required to solve problems; to recognize potential problems in the development stage; to integrate, apply and justify the particular use of definitions and legal principles in evaluating a legal scenario/problem.	
Student Study Effort Expected	Class contact:	
	▪ Lecture	26 Hrs.
	▪ Tutorial	13 Hrs.
	Other student study effort:	
	▪ Preparation for lectures and tutorials sessions	39 Hrs.
	▪ Independent study and learning	70 Hrs.
	Total student study effort	148 Hrs.
Reading List and References	Albert Chen, *AN INTRODUCTION TO THE LEGAL SYSTEM OF THE PEOPLE'S REPUBLIC OF CHINA* (LexisNexis 2011). Allan Leung & Douglas Clark, *CIVIL LITIGATION IN HONG KONG* (Sweet & Maxwell 2012). *BUTTERWORTHS HONG KONG CONTRACT LAW HANDBOOK* (LexisNexis 2013). Chee, Simon (2016), *Construction Dispute Prevention and Resolution in Hong Kong*, Sweet & Maxwell and Hong Kong Construction Arbitration Centre, Limited Chee, Simon (2013), (Thesis) *From right to Interest – Specialised Facilitative Mediation (Construction)*, City University of Hong Kong. Clement Shum, *GENERAL PRINCIPLES OF HONG KONG LAW* (3rd Ed. Longman 1998). Geoffrey Ma, et al, eds. *ARBITRATION IN HONG KONG: A PRACTICAL GUIDE* (3rd Ed. Sweet & Maxwell 2014). *Hong Kong Arbitration Ordinance Cap. 609*. *Hong Kong Mediation Ordinance Cap 620*. *HKIA / HKIS / HKICM Standard Forms of Building Contracts* (2005, 2006 Editions). Ian Robinson & Derek Roebuck, *INTRODUCTION TO LAW IN THE HONG KONG SAR* (2nd Ed. Sweet & Maxwell 2001). J.A. Mclnnis, *HONG KONG CONSTRUCTION LAW* (Butterworths Asia 1997).	

	Jill Cottrell, *Legal research: A GUIDE FOR HONG KONG STUDENTS* (Hong Kong University Press 1999). Krishnan Arjunan & Abdul Nabi Baksh, *BUSINESS LAW IN HONG KONG* (2nd Ed. LexisNexis 2009). Legal database in PolyU's library. Martyn Hills, *BUILDING CONTRACT PROCEDURES IN HONG KONG* (Longman Hong Kong Education 2001). Michael Fisher & Desmond Greenwood, *CONTRACT LAW IN HONG KONG* (2nd Ed. Hong Kong University Press 2011). Michael Moser & Teresa Cheng, *HONG KONG ARBITRATION: A USER'S GUIDE* (3rd Ed. Wolters Kluwer Hong Kong Limited 2014). Peter Corne & Susan Finder, *A GUIDE TO THE LEGAL SYSTEM OF THE PRC* (Asia Law & Practice 1997). Rick Glofcheski, *TORT LAW IN HONG KONG* (3rd Ed. Sweet & Maxwell 2012). Roger Nissim, *LAND ADMINISTRATION AND PRACTICE IN HONG KONG* (4th Ed. Hong Kong University Press, 2016). Sarah Nield, *HONG KONG LAND LAW* (2nd Ed. Addison Wesley Longman 1997). Stephen D. Mau, *HONG KONG LEGAL PRINCIPLES: IMPORTANT TOPICS FOR STUDENTS AND PROFESSIONALS* (2nd Ed. Hong Kong University Press 2013). Stephen D. Mau, *CONTRACT LAW IN HONG KONG* – AN INTRODUCTORY GUIDE (2nd Ed. Hong Kong University Press 2016). Stephen D. Mau, *TORT LAW IN HONG KONG* – AN INTRODUCTORY GUIDE (2nd Ed. Hong Kong University Press 2015). Stephen D. Mau, *PROPERTY LAW IN HONG KONG* – AN INTRODUCTORY GUIDE (2nd Ed. Hong Kong University Press 2014). Vanessa Stott, *AN INTRODUCTION TO HONG KONG BUSINESS LAW* (4th Ed. Pearson Education South Asia 2010).

Subject Description Form

Subject Code	BRE210
Subject Title	Information and Data Analysis
Credit Value	3
Level	2
Pre-requisite / Co-requisite / Exclusion	Nil
Objectives	This subject is intended to develop the ability of students to understand and apply statistical concepts and computer & IT software packages in manipulating data for presentation, analysis, information modelling and decision-making throughout the process of construction and real estate developments.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Apply the knowledge of fundamental statistics in collecting, organizing, summarizing, presenting and analyzing data, as well as drawing valid conclusions. b. Use computer information management /modelling systems to search information, analyze and building up information models, as well as make reasonable decisions. c. Communicate effectively and work in collaboration with other members of the project team in a professional context. d. Adopt professional skills to identify, analyze and solve problems.
Subject Synopsis/ Indicative Syllabus	**Information Technology** Introduction to computers, networks and information systems. Searching on the Internet in knowledge world. Construction IT and CAD drawings. Building Information Modelling (BIM). Computer applications in information control / electronic documentation. Construction integrated management system and web-based project management. E-commerce, E-tendering and knowledge management. Introduction to profession-specific information systems for building surveying, construction management, quantity surveying and real estate. **Data Analysis** Descriptive statistics. Probability theory. Random variables and probability distribution functions. Sampling theory and sampling distributions. Hypothesis testing and decision making. Introduction to statistical programs.
Teaching/Learning Methodology	Lectures will be used to present essential concepts and principles of the various subject areas. Tutorial and laboratory sessions, where appropriate, will be used for discussion, problem-solving, hands-on demonstration and presentation. Interactive multimedia self-accessed learning materials will be provided via the department's computer network (e.g. LEARN@PolyU blackboard subject websites).

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c	d		
1. Continuous assessment	100%	√	√	√	√		
Total	100%						

The subject will be assessed on a continuous basis and no examination is required. Information technology (50%) and data analysis (50%) will constitute equal proportions of the total coursework mark of the subject (100%). Students must complete and pass each of the two assessment components of the subject in order to obtain an overall pass of the subject. Fifty percent (50%) of the total coursework mark will be devoted to a test on data analysis component, and the other 50% to information technology component. The total coursework mark will be based on a portfolio comprising a series of problem-based assignments, written tests, group reports and presentations. Marks will be allocated on both group effort and individual basis.

The problem-based assignments, written tests, group reports and presentations attempt to test the level of students' knowledge and application of fundamental statistical concepts and computer programs/ information management systems, in manipulating data for presentation, analysis and decision-making throughout the process of construction and real estate developments. Effectiveness of communication and teamwork, together with the application of professional skills in problem solving, will also be tested through all these assessment tools.

Student Study Effort Expected

Class contact:	
▪ Lectures	26 Hrs.
▪ Tutorials / Laboratory sessions	13 Hrs.
Other student study effort:	
▪ Self-learning and recommended reading	80 Hrs.
Total student study effort	119 Hrs.

Reading List and References	**Recommended:** **<u>Information Technology</u>** Construction Industry Computing Association (1995). *Building IT 2005: A Multi-media Presentation of Experts' View on Information Technology in the Construction Industry to the Year 2005.* CICA. Derfler, F.J. and Freed, L. (2005). *How Networks Work.* 7th Edition, Indiana. Krol, E. and Klopfenstein, B. (1996). *The Whole Internet: User's Guide and Catalog.* O'Reilly, California, USA. Wong, A.K.D. (2006). "Use of Smart Card for Enhancing Construction Site Human Resources Management". *Journal of Building and Construction Management*, Volume 10, Number 1, June, ISSN 1024-9540, 63-68. Wong, A.K.D. (2006). "E-tendering in Anti-corruption in the Hong Kong Construction Industry". *Proceedings of the CIB W89 BEAR (Building Education and Research) 2006 International Conference on Construction Sustainability and Innovation*, 10-13 April 2006, Hong Kong, Abstract on page 93. Wong, A.K.D., Wong F.K.W. and Abid Nadeem (2009). "Attributes of Building Information Modelling and its Development in Hong Kong". *The HKIE Transactions*, Volume 16, Number 2, June, ISSN 1023-697x, 38-45. Wong K.D., Wong K.W. and Abid Nadeem (2010). "Attributes of Building Information Modelling Implementation in Various Country". *Journal of Architectural Engineering and Design Management* - Special Issue in Integrated Design and Delivery Solutions, Volume 6, Number 4, November, ISBN 978-1-84971-275-0, 288-302. Wong K.D., Wong K.W. and Abid Nadeem (2011). "Government Roles in Implementing Building Information Modelling Systems: Comparison between Hong Kong and the United States". *Journal of Construction Innovation: Information, Process, Management*, Volume 11, Number 1, January, 61-76, Emerald Group Publishing Limited 1471-4175, DOI 10.1108/14714171111104637. Wong K.D., Wong K.W. and Abid Nadeem (2011). "Building Information Modelling for Tertiary Construction Education in Hong Kong". *Journal of Information Technology in Construction (ITcon)*, Volume 16, 467-476, http://www.itcon.org/2011/27. *Journal of Information Technology in Construction (ITcon)*: http://www.itcon.org **<u>Data Analysis</u>** Berenson, M.L., Levine, D.M. and Szabat, K.A. (2015). *Basic Business Statistics – Concepts and Applications*, 13th Edition, Pearson Education, Boston, USA. Bland, J.A. (1985). *Statistics for Construction Students*, Construction Press. Devore, J.L. (2016). *Probability and Statistics for Engineering and the Sciences*, 9th Edition, Cengage Learning, Boston, USA.

Lapin, L.L. (1990). *Probability and Statistics for Modern Engineering*, 2nd Edition, PWS-Kent Publishing Company, Massachusetts, USA.

Hogg, R.V., McKean, J.W. and Craig, A.T. (2013). *Introduction to Mathematical Statistics*, 7th Edition, Pearson, Boston, USA.

Levin, R.I. and Rubin, D.S. (1998). *Statistics for Management*, 7thEdition, Prentice-Hall, New Jersey, USA.

Lucey, T. (2002). *Quantitative Techniques*, 6th Edition, Continuum, London, UK.

Mendenhall, W., Beaver, R.J. and Beaver, B.M. (2013). *Introduction to Probability and Statistics*, 14th Edition, Pacific Grove, California, USA.

Mendenhall, W., Reinmuth, J.E. and Beaver, R. (1993). *Statistics for Management and Economics*, 7th Edition, Duxbury Press, California, USA.

Scheaffer, R.L., Mulekar, M.S. and McClave, J.T. (2011). *Probability and Statistics for Engineers*, 5th Edition, Brooks/Cole, Boston, USA.

Supplementary:

Biow, L. and Wattenmaker, P.D. (1993). *How to Use Your Computer*. CA: Ziff-Davis Press.

CIOB, *Construction Computing*. CIOB.

December, J. (1996). *HTML 3.2 and CGI Unleashed:Professional Reference*. Sams Net.

Edding, J. (1994). *How the Internet Works*. C.A: Ziff-Davis Press.

Kirkpatrick, L.A. and Feeney, B.C. (2015). *A Simple Guide to IBM SPSS® Statistics for Version 22.0*, Cengage Learning, Boston, USA.

Stephen, M. (1997). *PowerPoint 97 for Windows Made Simple*. Made Simple, Oxford, UK.

Venditto, G. (1984). *Best Uses for Your Computer*. CA: Ziff-Davis Press.

West, B. (1994). *Basic Computing Principle*. Oxford: NCC Blackwell.

Subject Description Form

Subject Code	BRE217
Subject Title	Planning and Development
Credit Value	3
Level	2
Pre-requisite / Co-requisite / Exclusion	Nil
Objectives	1. Examine the forces and underlying mechanism of urbanization and development of cities. 2. Review the planning and development practices in Hong Kong. 3. Critically evaluate development policies and strategies relating to territorial development and urban planning.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Tackle core urban theories and analyze socio-economic and institutional factors affecting land use patterns, urban built-forms, and growth and decline of cities. b. Comprehend the regulations and practices related to urban planning and development context. c. Understand the politics of planning and development in the process of conservation and development. d. Communicate and work effectively with various professionals involved in different stages of urban planning.
Subject Synopsis/ Indicative Syllabus	A review of planning system and land use problems in Hong Kong; Discussions on Territorial Development Strategy, harbor reclamation, urban redevelopment and rural area planning; an overview of the land conversion and development process in Hong Kong; an introduction to statutory and administrative control systems related to urban development; an evaluation on the tactics adopted by professional to tackle the common problems arising from the urban development process; a critical review of government policy affecting the land development industry.
Teaching/Learning Methodology	Relevant theories, concepts and regulations related to urban planning will be introduced in lectures, supplemented with applications and discussions during seminars. Outside planning professionals will be invited to give guest lecture on current planning and development issues. Students are required to conduct case studies on planning issues and present their findings in tutorial class. Students will be required to participate in discussions during tutorial class and provide comments on their classmates' research works.

<table>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td></td><td></td></tr>
<tr><td>1. Student Projects</td><td>40%</td><td></td><td>√</td><td></td><td>√</td><td></td><td></td></tr>
<tr><td>2. Written Examination</td><td>60%</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="6"></td></tr>
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</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lectures</td><td>26 Hrs.</td></tr>
<tr><td>▪ Tutorials</td><td>13 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Readings</td><td>21 Hrs.</td></tr>
<tr><td>▪ Group discussion and revision</td><td>60 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>120 Hrs.</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>

Brenner, N., Marcuse, P., & Mayer, M. (2012). *Cities for People, Not for Profit: Critical Urban Theory and the Right to the City*. London: Routledge.

Cervero, R., & Murakami, J. (2009). Rail and Property Development in Hong Kong: Experiences and Extensions. *Urban Studies*, *46*(10), 2019–2043.

Fainstein, S. S., & DeFilippis, J. (2016). *Readings in Planning Theory* (Fourth ed.). GB: Wiley-Blackwell.

Fainstein, S. S., & Campbell, S. (2002). *Readings in urban theory* (2nd ed.). Oxford: Blackwell.

HKSARG (2007). Hong Kong 2030+ Topical Papers and Reports. Retrieved from https://www.hk2030plus.hk/explore_a.htm

HKSAR (2019). *Hong Kong Planning Standards and Guidelines*. Retrieved from https://www.pland.gov.hk/pland_en/tech_doc/hkpsg/index.html

Lai, W.H., Ho, C.W., Leung, H.F. (2017) *Change in Use of Land: A Practical Guide to Development in Hong Kong (Third Edition)*, Hong Kong: Hong Kong University Press.

Levy, J. M. (2016). *Contemporary Urban Planning,* New York: Taylor & Francis.

Nissim, R. (2016) *Land Administration and Practice in Hong Kong, Fourth Edition*, Hong Kong University Press.

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	Ng, M. K. (2020). Transformative urbanism and reproblematising land scarcity in Hong Kong. *Urban Studies*, *57*(7), 1452–1468. Scott, A. J. (2001). *Global city-regions: trends, theory, policy*. Cambridge, UK; New York: Oxford University Press. Sun, Y., Phillips, D. R., & Wong, M. (2018). A study of housing typology and perceived age-friendliness in an established Hong Kong new town: A person-environment perspective. *Geoforum, 88*, 17-27. Sun, Y., Fang, Y., Yung, E. H. K., Chao, T.-Y. S., & Chan, E. H. W. (2020). Investigating the links between environment and older people's place attachment in densely populated urban areas. *Landscape and Urban Planning, 203*, 103897. UN-HABITAT. (2017). *New Urban Agenda*. Retrieved from http://habitat3.org/wp-content/uploads/NUA-English.pdf United Nations (2015). *Sustainable Development Goals*. Retrieved from https://www.un.org/sustainabledevelopment/sustainable-development-goals/ WHO. (2007). *Global Age-Friendly Cities: A Guide*. Switzerland: WHO Press. Yung, E. H. K., & Sun, Y. (2020). Power relationships and coalitions in urban renewal and heritage conservation: The Nga Tsin Wai Village in Hong Kong. *Land Use Policy, 99*, 104811.

Subject Description Form

Subject Code	BRE222
Subject Title	Workshop Practices and Draftsmanship
Credit Value	3
Level	2
Pre-requisite / Co-requisite / Exclusion	Nil
Objectives	1. Provide students an opportunity to 'learn by doing' in terms of participating in practical construction work; and 2. Provide students with knowledge of principles and techniques of construction drawing both manually or using AutoCAD as a CAD tool and enable them to appreciate the use of engineering drawings as a communication medium in the construction industry.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Identify good practices and workmanship for major trades in building projects. b. Describe actual work sequences and methods in major builder's work. c. Explain the technology impact on equipments, materials and work methods to keep abreast of technology development and building practices. d. Prepare basic sketches, orthographic projections and working drawings and produce a simple building plan to recognized construction drawing standards. e. Produce simple construction CAD drawing with AutoCAD. f. Communicate using engineering drawings as media.

Subject Synopsis/ Indicative Syllabus

Workshop Practices

Key concepts, appreciation and practice on building skills for major trades; characteristics and properties; trades tools and materials; reading of construction working drawings; measurement and setting out techniques; materials preparation; fabrication process; good site practices.

Area / Topic	Duration
Brickwork • Introduction to common types of brickwork, blockwork; wall finishes, tiling, plastering; and • Bricklaying practice.	3 hrs
Concrete • Introduction to concrete materials, plants and concrete mixing process; • Batching, mixing, placing of concrete; and • Site quality control tests, e.g. slump test.	6 hrs
Reinforcement • Introduction to types of steel bars, RC details and bending scheduling; • Cutting, bending and fixing of reinforcement bars of beam, column; and • Site inspection on fixed bars.	6 hrs
Formwork • Introduction to types of forms, materials; tools and equipment; • Simple formwork design; and • Fabrication of timber formwork.	6 hrs
Scaffolding • Introduction to types of metal scaffolding and falsework, materials; tools and equipment; scaffolding safety; and • Erection of simple scaffolding.	3 hrs
Structural Steelwork • Introduction to types of structural steel sections, material properties; tools and equipment; • Cutting and jointing methods, welding, bolt & nuts; and • Appreciation of welding tests.	6 hrs
Plumbing • Introduction to types of plumbing materials, tools, pipes and fittings; • Pipe fitting and jointing methods practice; and • Pipe pressure testing.	3 hrs
Total	33 hrs

Draftsmanship

Key concepts, appreciation and practice on drafting skills on 2D construction drawings by manual and CAD software; drawing standards, common symbols; interpretation of construction working drawings; good practices.

	<table><tr><th>Area / Topic</th><th>Duration</th></tr><tr><td>Manual Drafting - Introduction to construction drawing practices based on BS1192; - Orthographic projection techniques, sectioning; - Dimensioning and leaders, free hand sketching; and - Production of building floor plans and architectural details. </td><td>13 hrs</td></tr><tr><td>CAD by AutoCAD - Introduction to application of CAD in construction drawings; - Basic 2D geometry functions: point, line circle and arc; zoom, pan, fit and redraw; trim fillet and erase; dimensioning, text and label; line types, colour, layers and views; and - CAD exercise on building floor plan and architectural features. </td><td>13 hrs</td></tr><tr><td>Total</td><td>26 hrs</td></tr></table>
Learning Methodology	**Workshop Practices** The course will be conducted on highly participative with both theory and hands-on practical sessions, good practices demonstration basis with theoretical supplement. The general principles, techniques and related technologies will be presented to students. Students learn the required skills through practical exercises and case studies. Their learning skills will be strengthened through group projects for developing their problem solving skills, integrating their learning and applying their learning techniques under real world environment. **Draftsmanship** • Demonstration of good practices of manual draftsmanship and AutoCAD Skills (2D) during lectures; • Hands-on practices on construction featured exercises by manual drafting and AutoCAD in computer training room; • Interactive feedback on hands-on exercises and assignments; and • Self-revision by reviewing the reading materials on webs developed by IC.

Assessment Methods in Alignment with Intended Learning Outcomes

Assessment Methods	% Weighting	Intended Learning Outcomes Assessed					
		a	b	c	d	e	f
1. Report (W/S Practice)	35%	√	√	√			
2. Quiz (W/S Practice)	15%	√	√	√			
3. Coursework (Draftsmanship)	30%				√	√	√
4. Test (Draftsmanship)	20%				√	√	√
Total	100%						

Workshop Practices

Experiential learning is emphasized in the training programme, 100% attendance is expected. Students are organized to work closely in small groups with IC training staff, wide range of construction process and good practices are exercised in workshops and lectures. Students will acquire skills through participation in different tasks and hands-on practices; their skills are recorded and assessed in their coursework and reports. Appropriate questions are set in the quiz to test the knowledge of the students gained in the module.

Draftsmanship

Student performance in this subject is entirely based on continuous assessment. A wide range of building drawings is used in the hands-on coursework. It enables students to familiarise with the skills and develop the competence of manual drafting and AutoCAD. The questions in the quizzes will embrace most of the syllabus and will be set to align with the intended learning outcomes.

Student Study Effort Expected	Class contact:	
	(Workshop Practices)	
	▪ Workshops / In-Class practice	33 Hrs.
	(Draftsmanship)	
	▪ Lectures	12 Hrs.
	▪ Tutorials / In-Class practice	14 Hrs.
	Other student study effort:	
	▪ Self-Development	5 Hrs.
	▪ Coursework (Workshop Practices)	2 Hrs.
	▪ Coursework (Draftsmanship)	14 Hrs.
	Total student study effort	80 Hrs.
Reading List and References	**Essential Textbooks/ Reading Materials:** Refers to the individual IC module description TM1219 and TM8028. **References:** HK Housing Society “Quality Field Practices”, HK Housing Society, 2003.	

Subject Description Form

Subject Code	BRE258
Subject Title	Industrial Safety I
Credit Value	1 Academic Credit
Level	2
Pre-requisite / Co-requisite / Exclusion	Nil
Objectives	To provide health and safety training to BRE students with emphasis being placed upon safety awareness, accident prevention and the safety issues associated with construction industry.
Intended Learning Outcomes	Upon completion of this subject, students will be able to: a. Describe the legal requirements/codes of practice relating to construction safety *(Syllabus Item 1).* b. Describe the common types of work-related accidents and identify potential Occupational Safety and Health hazards at construction sites, and recommend associated preventive measures including the use of personal protective equipment *(Syllabus Items 2 and 3)*. c. Describe the importance of, and procedures for, reporting accidents and dangerous occurrences *(Syllabus Item 3)*; and d. Outline the safety management principles applicable to the construction industry *(Syllabus Item 4)*.
Subject Synopsis/ Indicative Syllabus	1. **Overview**: Introduction to construction safety; Government's policy in industrial safety; safety & health legislation in Hong Kong. 2. **Construction Safety**: Construction Sites (Safety) Regulations; codes of practice; potential hazards/risks associated with construction sites and high risk activities such as working in confined space. 3. **Safety Technology**: Machinery safety and guarding; workplace ergonomics including display screen equipment and manual handling; personal protective equipment; first aid and emergency preparedness; reporting accidents and dangerous occurrences; fire safety, electrical hazards. 4. **Safety Management**: Safety training; safety policy; safety committees; safety inspection; safety audit.

<table>
<tr><td>Learning Methodology</td><td>Lectures, supported by illustration, demonstration and student-teacher interaction.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% Weighting</td><td colspan="4">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td></tr>
<tr><td>1. Coursework</td><td>70%</td><td>√</td><td>√</td><td>√</td><td></td></tr>
<tr><td>2. Test</td><td>30%</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>Total</td><td>100%</td><td colspan="4"></td></tr>
</table>
</td></tr>
<tr><td rowspan="6">Student Study Effort Required</td><td colspan="2">Class contact:</td></tr>
<tr><td>▪ Lecture and Test</td><td>8 Hrs.</td></tr>
<tr><td>▪ Tutorial</td><td>14 Hrs.</td></tr>
<tr><td colspan="2">Other student study effort:</td></tr>
<tr><td>▪ Coursework</td><td>3 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>25 Hrs.</td></tr>
<tr><td>Reading List and References</td><td>Course material at:
http://158.132.155.107/e-learning/OES/OES.htm</td></tr>
</table>

Subject Description Form

Subject Code	BRE262
Subject Title	Project Studio
Credit Value	3
Level	2
Pre-requisite / Co-requisite / Exclusion	Nil
Objectives	1. Provide a platform for students to integrate knowledge and to develop critical thinking and problem solving skill in the context of controversial issues and practical problems in the building and real estate industry. 2. Nurture a sense of social responsibility through the application of professional knowledge. 3. Encourage student-centred learning and develop their generic and professional competence. 4. Provide basic and practical training in construction drawing skills.
Intended Learning Outcomes	Upon completion of the subject, students should be able to: <u>Academic Outcomes</u> a. Understand construction and real estate industry in Hong Kong and identify key issues and problems the industry faces. b. Evaluate current issues and policies in a systematic and analytical manner. c. Synthesize various sources of information to search for creative solution to contemporary issues and practical problems. d. Reflect on the roles of professionals in the relevant fields of professional practice in the construction and real estate industry. e. Propose course of action for problems emerging from a rapidly changing urban environment of Hong Kong. f. Demonstrate skills in construction drawing and master AutoCAD in project work. <u>Generic Outcomes</u> 1. Gather and analyze relevant information using appropriate technology. 2. Communicate the arguments in a clear and articulated manner. 3. Develop critical and creative minds. 4. Work independently and identify needs for self-learning and self-improvement. 5. Co-operate with others in a professional team working environment to excel for the common goal.
Subject Synopsis/ Indicative Syllabus	This course examines important issues and policies in construction and real estate industry of Hong Kong, allowing for the city's unique socioeconomic milieu and development trajectories. It starts with a review of urban development pathway of Hong Kong and its implications for land, housing and real estate development. It is followed by an in-depth appreciation of current issues in the field of construction and property development, with particular reference to Hong Kong as a high-density city with an executive-led government. The latest development trends (for instance, public consultation on Hong Kong 2030+, building up age-friendly city and the central government initiated belt and road initiatives, etc.) will be reflected to shed light on the development prospect of the city and industry. Besides, students are expected to undertake Industrial Centre training and master construction drawing skills.

	Examples of contemporary issues/ policies in building and real estate industry: Urban development and sustainability • Housing and land use policy • Population ageing and ageing in place • Urban renewal • Spatial justice and "right to the city" • Building control and safety • Sustainability, urban development and the society Technology and management • Smart city and big data • Professional practice, industrial organization and innovations • The structure of the industry and the competitive environment • Assets and property management Construction and real estate industry in prospect • The "belt and road initiatives" • Infrastructure development
Teaching/Learning Methodology	This subject comprises two components: (a) BRE Professional Studies & Evaluation (2 credits); and (b) Industrial Centre (IC) training (1 credit). **I. BRE Professional Studies & Evaluation** This component consists of lectures and tutorials. Lectures will revisit the contemporary issues and latest policies on town planning, building and property industry. The students are expected appreciate the issues using proper theories and models, as well as to reflect on their personal/professional development through synthesizing the subject matters. After finishing the lectures, students are required to submit an essay. Students are encouraged to explore and identify issues in relation to construction and real estate development of Hong Kong through group project and thus enhance their problem-solving skills. Each group should give an in-class presentation during the tutorial sessions. Floor students are required to ask questions and/or make comments after the presentation. **II. Industrial Centre (IC) Training** This component is delivered by the Industrial Centre and involves training workshops and practical project works in construction drawing. It involves technical demonstrations, followed by self-assessments to ensure students' acquisition of the skills. Student attendance to the demonstrations is compulsory.

Assessment Methods in Alignment with Intended Learning Outcomes

I. Assessment Overview

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Academic Outcomes)					
		a	b	c	d	e	f
1. Group project	25%	√	√	√	√	√	
2. Essay	45%	√	√	√	√	√	
3. IC Training	30%						√
Total	100%						

II. Assessment Procedures

The emphasis of the course will be on active participation: students are encouraged and expected to read widely, assess critically the relevant literature and contribute to lecture and class discussions.

Essay
A term paper of 1,000 words (excluding reference) on identified issues of Hong Kong. The paper should demonstrate active engagement in lecture contents and reading materials, as well as add values to the understanding of current practices and policies in at least one of the following areas:

- urban planning
- building and construction
- real estate development

Group project
Students are expected to work in group and to accomplish one study based on the topic they choose. It is encouraged to conduct on site investigation and consult the relevant reading materials and websites for data collection. Each group should give one presentation during tutorial sessions and critically comment on their peer's work. Students should maintain regular discussions with tutors and/or course instructors regarding the progress of the project.

Weighting: 20% for the group presentation plus 5% via peer assessment (by fellow group members)

III. Assessment Criteria

The following evaluation criteria are adopted:

Essay:

- ***Addressing the task:*** identify and address clearly the main question(s).
- ***Knowledge***: demonstrate comprehensive understanding of relevant concepts and theories; the analysis, synthesis and application of knowledge is consistently clear and effective.
- ***Argumentation***: examine the question/issue/ problem from important perspectives. Overall logic is clear. Premises or evidence should support conclusions.
- ***Structure***: introduction states clearly writer's thesis or position, and conclusion clearly summarizes main arguments. Paragraphing is logical and appropriate.
- ***Mechanics***: grammar and vocabulary are properly used. Conventions of academic writing (e.g. citation, references, footnotes, etc.) are followed.

<table>
<tr><td></td><td colspan="2">Presentation:
• Knowledge: ability to contribute new and relevant information using a variety of learning resources.
• Concepts: a capacity to use different concepts to attain a thorough understanding of the development processes.
• Logical thinking & reasoning: ability to critically assess data and information and draw justifiable conclusions.
• Communication skills: ability to communicate and articulate ideas or ask questions.
• Presentation skills: ability to use multi-media means in presentation.
• Self-improvement: ability to recognize own strengths and weaknesses and take appropriate actions to correct areas requiring attention.

Research integrity:
Softcopy will be submitted to Turnitin for plagiarism check. (User Guide: http://edc.polyu.edu.hk/PSP/SG_Turnitin.pdf). Any assignment that is reported as plagiarism will be marked Zero. Please refer to University's explanation on plagiarism and advices to avoid it:
https://www.polyu.edu.hk/ogur/academic_integrity/Plagiarism_Booklet.pdf</td></tr>
<tr><td rowspan="9">Student Study Effort Required</td><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lectures (2-hour lecture per week, week 1-6)</td><td>12 Hrs.</td></tr>
<tr><td>▪ Tutorials (including presentation)</td><td>12 Hrs.</td></tr>
<tr><td>▪ Industrial Centre Training Workshop</td><td>26 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Reading / self-study</td><td>30 Hrs.</td></tr>
<tr><td>▪ Assessment: group project</td><td>30 Hrs.</td></tr>
<tr><td>▪ Assessment: essay</td><td>30 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>140 Hrs.</td></tr>
<tr><td>Reading List and References</td><td colspan="2">Indicative Reading List:

Brenner, N., Marcuse, P. & Mayer, M. (2012). Cities for People, Not for Profit: Critical Urban Theory and the Right to the City. London: Routledge.

Huang, H. & Chan, E.H.W. (2000). Building Hong Kong: Environmental considerations. Hong Kong: Hong Kong University Press.

Chiang, Y.H., Anson, M. & Raftery, J. (2003). The construction sector in the Asian economies. London: Spon Press.

Ganesan, S., Hall, G. & Chiang, Y.H. (1996). Construction in Hong Kong: Issues in labour supply and technology transfer. Aldershot, Hants, England: Avebury.

Gurran, N., Gallent, N. & Chiu, R.L.H. (2016). Politics, planning and housing supply in Australia, England and Hong Kong. New York: Routledge.</td></tr>
</table>

Deakin, M. (2004). *Property management: Corporate strategies, financial instruments, and the urban environment.* Aldershot: Ashgate.

HKSARG (Hong Kong. Special Administrative Region Government). Environment Bureau. (2015). *Hong Kong climate change report 2015*. http://www.enb.gov.hk/sites/default/files/pdf/ClimateChangeEng.pdf.

Kyle, R.C., Spodek, M.S. & Baird, F.M. (2016). *Property Management*. Dearborn Real Estate Education.

Lai, L.W. & Ho, C.D. (2002). *Planning buildings for a high-rise environment in Hong Kong: A review of building appeal decisions*. Hong Kong: Hong Kong University Press.

Lai, L.W., Ho, D.C. & Leung, H. (2010). *Change in use of land: A practical guide to development in Hong Kong*. Hong Kong: Hong Kong University Press.

Leung, A.Y.T. & Yiu, C.Y. (2004). *Building dilapidation and rejuvenation in Hong Kong*. Hong Kong: Hong Kong Institute of Surveyors.

Logan, J.R. & Molotch, H.L. (2007). *Urban fortunes: The political economy of place*. Berkeley, CA: University of California Press.

National Development and Reform Commission, Ministry of Foreign Affairs, and Ministry of Commerce of the People's Republic of China. *Vision and actions on jointly building silk road economic belt and 21st-century maritime silk road*. Available at https://eng.yidaiyilu.gov.cn/qwyw/qwfb/1084.htm

Ng, M.K. (2006). World-city formation under an executive-led government: The politics of harbour reclamation in Hong Kong. *Town Planning Review, 77*(3), 311-337.

Ng, M.K. (2016). The right to healthy place-making and well-being. *Planning Theory & Practice, 17*(1), 3-6.

Nissim, R. (2012). *Land administration and practice in Hong Kong*. Hong Kong: Hong Kong University Press.

Poon, T.N.T. & Chan, E.H.W. (1998). *Real estate development in Hong Kong*. Hong Kong: PACE Pub.

Reed, R. & Sims, S. (2015). *Property development*. London: Routledge.

Sullivan, W.M. & Carnegie Foundation for the Advancement of Teaching. (2005). *Work and integrity: The crisis and promise of professionalism in America*. San Francisco, CA: Jossey-Bass.

UN-HABITAT (The United Nations Human Settlements Programme). (2016). *New urban agenda: Quito declaration on sustainable cities and human settlements for all*. Available at http://habitat3.org/wp-content/uploads/N1639668-English.pdf.

Wong, Y.C.R. (2015). *Hong Kong land for Hong Kong people: Fixing the failures of our housing policy*. Hong Kong: Hong Kong University Press.

Yung, B.R. (2008). *Hong Kong's housing policy: A case study in social justice*. Hong Kong: Hong Kong University Press.

	Websites: Topical papers and reports in relation to Hong Kong 2030+. Available at http://www.hk2030plus.hk/explore_a.htm IC Student Handbook. Available at https://www.polyu.edu.hk/ic/lt/pdf/UI/ACT20160118%20IC%20Training%20-%20IC%20Student%20Handbook%20(2016%20Edition).pdf IC Training Material. Available at https://www.polyu.edu.hk/ic/lt/hkpu.htm

Subject Description Form

Subject Code	BRE263
Subject Title	Construction Economics and Finance
Credit Value	3
Level	2
Pre-requisite / Co-requisite / Exclusion	Nil
Objectives	This subject is intended to: 1. Provide students with an economics perspective of the real estate and construction sectors, and an understanding of their roles on the general economy. 2. Introduce to students the financial markets, institutions and instruments in the context of the construction and real estate industry. 3. Enable students to identify and analyze industry-wide problems based on an understanding of the market structure, performance and behaviour of the industry.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Describe the size and market structure of the property and construction industries, and consequently articulate why construction and real estate has played an important role on economic development, particularly in the case of Hong Kong. In particular, students would be able to: 1) describe the contribution of the property and construction industries to economic growth; 2) describe how much the construction output has been in countries around the globe; 3) describe some salient features of the property and construction sectors, including new-build and retrofitting works. b. Apply macroeconomics theories, in particular those concerning business fluctuations, aggregate demand, and the Keynesian multiplier model to understand and describe the economic and social role of the property and construction industries. With such competence, students would be able to: 1) evaluate whether fiscal plans adopted by governments around the globe would work as intended to stimulate the general economy; 2) give their own ideas of how such fiscal policies should be formulated and implemented in view of constraints and limitations; 3) articulate the inter-relationship between the property and construction industries, the banking industry and the macro-economy; 4) identify problems related to the market structure and the behaviours of the stakeholders.

	c. Estimate the profitability of projects and firms with an understanding of how project and corporate finance can be raised from the money and capital markets. In particular, students would be able to: 1) understand the time value of money, and calculate net present value and internal rate of return (IRR) of projects; 2) estimate the weighted average cost of capital (WACC) of a firm or a project; 3) evaluate the profitability of a project based on WACC; 4) describe the various financial instruments and understand how their costs could be estimated. d. Be able to articulate the roles and interdependence of participants in the construction and real estate industry, including developers, consultants, contractors, property managers and the government. e. Be able to effectively communicate their ideas, to make contributions to teamwork and to demonstrate their leadership potential. Students are required to present their works and findings in groups and lead the discussions afterwards, learning to communicate their ideas and advance their arguments in an effective and convincing manner. The group work setting will also facilitate their understanding of group dynamics, cultivating their leadership skills and nurturing their sense of responsibility being part of a team. They are assessed both individually and as a group.
Subject Synopsis/ Indicative Syllabus	An overview of macro-economic theories. Roles of property and construction on the economy, with comparisons between some economies around the globe and the particular case of Hong Kong. The relationship between the property/construction industry, the financial institutions, markets and the participants. Pricing of financial instruments including debts, equities and REITs. Economic viability and financial feasibility of projects including their externalities such as carbon emissions. An overview of market structure, performance and behaviour of the real estate and construction industry in Hong Kong. Economic problems associated with the Asian Financial Crisis, the Sub-prime Crisis and globalisation.
Teaching/Learning Methodology	Students spend half of their total contact hours in mass lectures, and another half in seminars. Tutorials are interactive and students are encouraged to participate in discussions. Topics are introduced in the lectures and the key issues highlighted as well, supplemented with further learning and reference materials downloaded from the web. Subsequent seminars provide the opportunity for more in-depth discussion of the main issues delivered in the lectures. Themes of the seminars will follow closely that of the lectures, so that the framework introduced in the lectures can be further illustrated, exemplified and elaborated. Learning materials will also be assessible from the web.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c	d	e	
1. Seminar / Group Report 1	20%	√	√	√		√	
2. Seminar / Group Report 2	20%		√		√	√	
3. Examination	60%	√	√	√	√	√	
Total	100%						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Learning outcomes	***Assessed principally through***			
	Oral Seminar Presentation	Written Seminar Report	Attendance and Performance in Class	Examination
All-rounded attributes:				
1. to possess skills to identify, analyze and solve problems		√		√
2. to have an understanding of professional, social and ethical responsibilities				√
3. to communicate effectively	√	√	√	√
4. to contribute as team member and to lead effectively	√	√		
5. to identify contemporary issues			√	√
Intended learning outcomes of course:				
1. An ability to describe the size and market structure of the property and construction industries are and consequently an understanding of why construction and real estate has played an important role on economic development, particularly in the case of Hong Kong.	√	√		√

2.	Be capable of applying macroeocnomics theories, in particular those concerning business fluctuations, aggregate demand, and the Keynesian multiplier model on the economic and social role of the property and construction industries: identifying problems related to the market structure and the behaviours of the stakeholders	√ √	√ √		√
3.	Be able to evaluate economic viability and financial feasibility of projects including their life-cycle costing, costs of externalities, alternative sources of finance and explain the basis of the pricing of the basic financial instruments.	√	√		√
4.	Be able to articulate the roles and interdependence of participants in the construction and real estate industry, including developers, consultants, contractors, property managers and the government.	√	√		√
5.	Be able to effectively communicate ideas and to make contributions to teamwork			√	

<u>The assessment criteria adopted in tutorial seminars</u>

Nature of Coursework: Individual Presentation and Group Report

<u>Assessment criteria (% are indicative only, may be varied by distributed rubrics)</u>:

1. Seminar (oral presentation) – individual assessment (40%)
2. Seminar (Group report) – overall (group) assessment (40%)
3. Attendance and active participation in Q and A (20%)

1. Seminar (oral presentation) – individual assessment (40%)

   Individual assessment is based on:
   a. Clarity of presentation
   b. Oral presentation skills
   c. Facilitation of Q & A session

2. Seminar (Group report) – overall (group) assessment (40%)

Assessment of the group is based on:

a. Understanding of the central theme and identification of relevant issues
b. Collection of data / information
c. Data interpretation and analyses
d. Written communication skills.
e. Conclusion

3. Attendance and active participation in Q and A (20%)

Each student is encouraged to participate actively in the Q & A session. Each student will be asked to raise at least one question.

Evidences students are expected to give to get the various grades under the criteria (this list below is indicative only, and may be varied by distributed rubrics; minus grades are possible due to spotted deficiencies pertaining to a main grade):

Grade		Report	Presentation
A+	1.	2. Excellent understanding of the central theme and identification of relevant issues 3. Insightful and stimulating 4. Very good collection of data / information (with some extra reading) 5. Very good data interpretation and analyses (good illustration by examples, case studies, figures and other evidences) 6. Display excellent written communication skills. 7. Excellent conclusion	1. Clarity of presentation 2. Stimulating presentation 3. Excellent oral presentation skills 4. Excellent Facilitation of Q & A session
A	1.	2. Very good understanding of the central theme and identification of relevant issues 3. Good collection of data / information 4. Good data interpretation and analyses (Good illustration of the answer by examples, case studies, figures and other evidences). 5. Display very good written communication skills. 6. Very good conclusion	1. Clarity of presentation 2. Good oral presentation skills 3. Facilitation of Q & A session
B+	1.	2. Good understanding of the central theme and identification of relevant issues 3. Good collection of data / information 4. Good data interpretation and analyses	1. Clarity of presentation 2. Good oral presentation skills 3. Good facilitation of Q & A session

			5. Display good written communication skills 6. Good conclusion	
	B	1.	2. Good understanding of the central theme and identification of relevant issues 3. Sufficient data collection, interpretation and analyses 4. Display good written communication skills 5. Good conclusion	1. Clarity of presentation 2. Good oral presentation skills 3. Facilitation of Q & A session
	C+	1.	2. Understanding of the central theme and display adequate knowledge of the subject 3. Sufficient data collection and analyses 4. Display reasonably good written communication skills 5. Reasonably good conclusion	1. Familiarity with the topic 2. Reasonably good oral presentation skills 3. Some facilitation and participation of Q & A session
	C	1.	2. Reasonable understanding of the central theme and display adequate knowledge of the subject 3. Provide sufficient data and information 4. Display some written communication skills 5. May have a reasonably good conclusion	1. Familiarity with the topic 2. Reasonably good oral presentation skills 3. Poor participation of Q & A session
	D+	1.	2. Display inadequate knowledge of the subject 3. Provide poor and insufficient data / information 4. Display poor written communication skills 5. May not have a conclusion	1. Poor knowledge of the topic 2. Poor oral presentation skills 3. Poor participation of Q & A session
	D	1.	2. Display poor knowledge of the subject 3. Provide poor and insufficient data / information 4. Display poor written communication skills 5. May not have a conclusion	1. Very poor knowledge of the topic 2. Poor oral presentation skills 3. Poor participation of Q & A session
	F	1.	2. Display no knowledge of the subject 3. Provide poor and insufficient data / information 4. Display poor written communication skills	1. No knowledge of the topic 2. Poor oral presentation skills 3. Poor participation of Q & A session

Student Study Effort Required	Class contact:	
	▪ Lecture	26 Hrs.
	▪ Seminars/Tutorials	13 Hrs.
	Other student study effort:	
	▪ Independent Study	96 Hrs.
	Total student study effort	135 Hrs.

Reading List and References

Recommended:

Park, Chan S. (2011). *Contemporary Engineering Economics*. 5th Edition. Upper Saddle River, N.J.: Prentice Hall.

Samuelson, P.A. and Nordhaus, W.D. (2010). *Economics*, 19th Edition. McGraw-Hill International Edition.

(Additional references may be given via online teaching materials, e.g., Learn@PolyU)

Supplementary:

Chiang, Y.H., Anson, M. and Raftery, J. (2004). *The Construction Sector in Asian Economies*. London and NewYork: Spon Press. 491pp.

Eccles, T., Sayce, S. and Smith, J. (1999). *Property and Construction Economics,* International Thomson Business Press.

Genberg, H. and Hui, C.H. ed. (2008). *The Banking Sector in Hong Kong: Competition, Efficiency, Performance and Risk.* NY: Palgrave MacMillan.

Glahe, F. and Lee, D. (1989). *Microeconomics,* Harcourt Brace Jovanovich: New York.

Hong Kong Government. *Annual Economic Reports and Reviews,* H.K. Government Printer (various years).

Hong Kong Polytechnic University. *AsiaConstruct Annual Country Reports on Construction and Real Estate Industry (Available via: http://www.asiaconst.com/past_conference/index.html).*

Hsu, B., Arner, D., Tse, K.S., Johnstone, S., Li, L. (ed.) and Lejot, P. (ed.) (2006) *Financial Markets in Hong Kong: Law and Practice.* Oxford University Press. 560pp.

Jao, Y.C. (1997). *Hong Kong as An International Financial Centre: Evolution, Prospects and Policies*. HK: City University of Hong Kong Press.

Low, C.K. ed. (2000). *Financial Markets in Hong Kong.* Singapore and NY: Springer.

Raftery, J. (1998), *Principles of Building Economics,* Blackwell Scientific Publications: Oxford.

	Young, L.S.F and Chiang, R.C.P. ed. (1997). *The Hong Kong Securities Industry,* 3rd Edition. HK: The Stock Exchange of Hong Kong, and Asia-Pacific Institute of Business, The Chinese University of Hong Kong. Helbæk, M. (2010) *Corporate Finance*, Open University Press (Online access via ebrary)

Subject Description Form

Subject Code	BRE265
Subject Title	Introductory Construction Technology and Materials
Credit Value	3
Level	2
Pre-requisite / Co-requisite / Exclusion	Nil
Objectives	This subject is intended to: 1. Equip students with an understanding of the function of buildings, and how different building elements and components behave, perform and interact among each other to achieve the general function. 2. To realize the range of building materials available for construction and gain an understanding of the key concepts determining classification, properties and applications.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Relate basic construction vocabulary and terminology of construction for various building materials, elements and components. b. Possess a knowledge of functional requirements of various building materials, elements and components and give preliminary appraisal to the performances of various building elements and components. c. Relate the inter-relationships among building materials, elements and components. d. Interpret and extract information from construction details / drawings.
Subject Synopsis/ Indicative Syllabus	**Materials (5 lectures)**: • Introduction to building materials – performance requirements, classification and general applications. • Building materials for structural use: Concrete & Steel. **Technology (8 Lectures):** • Introduction to building and the development of construction technology. System concept in modeling construction process. • Introduction to different forms loadings to buildings and how different building structures respond to correspondingly. • Functional requirements, vocabulary and construction processes of various major building elements/processes, including site evaluation, excavation, foundations, walls, floors, and roofs.

<table>
<tr><td></td><td>

- Functional requirements, vocabulary and construction processes of various building components: including stairs, non-load bearing walls, doors, windows, suspended ceiling and finishes.

</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>

The mode of delivering the subject comprises lectures, tutorials, laboratories and workshop training. Lectures aims at delivering the basic core concepts and knowledge, which are to be discussed and consolidated through tutorials.

Laboratory sessions (i.e., hands-on training at Industrial Centre) are used for enhancing students' comprehension on the performance of various building materials, whereas workshop training provides hands on experience to student on selected construction methods.

</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>

<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td></td><td></td></tr>
<tr><td>1.Tutorial Assessments</td><td>15%</td><td>√</td><td>√</td><td></td><td>√</td><td></td><td></td></tr>
<tr><td>2. Laboratory sessions (IC training)</td><td>Attendance</td><td>√</td><td>√</td><td></td><td></td><td></td><td></td></tr>
<tr><td>3. Focus Study Report</td><td>25%</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td><td></td></tr>
<tr><td>4. Written Examination</td><td>60%</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="6"></td></tr>
</table>

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Two tutorial exercises (quizzes) on construction technology and material will be used to evaluate student learning outcomes.

Successful completion of laboratory sessions (i.e., hands-on training at Industrial Centre) will allow students to understand current building construction practice. (100% attendance of IC training sessions is required to pass the subject.)

Focus Study Report allows students to choose specific topics on Building Materials and Construction Technology to conduct in-depth study and this can enhance the depth of the knowledge learned.

The examination will comprise multiple-choice and short answer questions on construction materials and problem based questions on construction technology.

The split between coursework and examinations is 40/60.

</td></tr>
</table>

Student Study Effort Required	Class contact:	
	▪ Lecture	26 Hrs.
	▪ Tutorial	13 Hrs.
	▪ Laboratories / Workshop	21 Hrs.
	Other student study effort (app.) :	
	▪ Assessments	20 Hrs.
	▪ Reading and Self-learning	40 Hrs.
	Total student study effort	120 Hrs.
Reading List and References	**Recommended:** Chudley R. and Greeno R. (2016) *Building Construction Handbook*, 11th ed. Pearson Chudley R. (2006) *Construction Technology*, 4th edition, Pearson/Prentice Hall Chudley R. (2012) *Advanced Construction Technology*, 5th edition, Pearson Foster J.S., et. al. (2007) *Structure & Fabric Part I & II*, 7th Edition, Prentice Hall Dean Y. (1996) *Finishes* 4th edition, Longman Blanc A. (1994) *Internal Components*, Longman McEvoy M. (1994) *External Components*, Longman Shaeffer R.E. (2007) *Elementary Structures for Architects and Builders*, Pearson/Prentice Hall 5th edition Taylor G.D. (2000), *Materials in Construction*, 2nd and 3rdedition, Longman Mamlouk M.S. and Zaniewski, J.P. *Materials for Civil and Construction Engineers*, 4th edition, Pearson Doran D., Cather R., *Construction Materials Reference Book*, 2014, Routledge **Supplementary:** HKSAR Government, *The Building Ordinance*, CAP123 HKSAR Government Printer BRE, *Digests & Current Papers*. Building Research Establishment, Garston, Watford, U.K.	

	Michael S Manlouk and John P Zaniewski (2016) Materials for Civil and Construction Engineers Pearson Charlett A.J. (2007), *Fundamental Building Technology*, Taylor & Francis Fleming E. (2005*), Construction Technology: an illustrated introduction*, Blackwell

Subject Description Form

Subject Code	BRE271
Subject Title	Measurement and Estimation
Credit Value	3
Level	3
Pre-requisite / Co-requisite / Exclusion	Nil
Objectives	This subject is intended to: 1. Enable students to understand the construction process and sequence of building works. 2. Enable students to appreciate the building measurement rules as stipulated in standard method of measurement. 3. Enable students to develop the skills required for measuring, quantifying, and pricing construction work.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Describe the construction process and sequence of new building works. b. Measure the new building works in accordance with the standard method of measurement. c. Synthesise and analyse the composition of unit rate and tender price.
Subject Synopsis/ Indicative Syllabus	*Building measurement for building works:* Organisation and systems of measurement including divisions of building works and building trades; mensuration used in measurement; measurement techniques for building works; comparative studies of measurement procedures; measurement using computers; composition of bills of quantities; composition of tender documents; and appreciation of forward trends. *Cost estimation for building works:* Factors influencing the pricing of new building works; evaluation of unit rate based on resources (labour, plant, and material); enquiries for cost rates; and calculation of unit rates for pricing tenders.
Teaching/Learning Methodology	1. Theories and rationales will be delivered in lecture periods. 2. In-class exercises will be given in lecture periods. 3. Practical knowledges and experiences will be shared and delivered in tutorial periods. 4. E-learning materials and e-discussion forums will be provided. 5. Building measurement software trainings will be delivered in the workshops. 6. Guest lectures will be arranged to introduce the professionalism of surveyors and engineers in Hong Kong construction industry.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c			
1. Coursework 1: Individual assignment (taking off exercise, preparing bills of quantities)	15%	√	√				
2. Coursework 2: Individual assignment (taking off exercise, preparing bills of quantities, pricing bills of quantities)	15%	√	√	√			
3. Coursework 3: Group project (estimating problem)	20%			√			
4. Examination	40%	√	√	√			
5. Effort	10%	√	√	√			
Total	100%						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Coursework 1, Coursework 2

Coursework 1 and Coursework 2: Students are given assignments (taking off exercise) for measuring the building works using the provided construction drawings. Coursework 1 and Coursework 2 are to assess students' ability:

i. To identify and familiarise with the building components through reading construction drawings.

ii. To understand the construction activities and sequence.

iii. To gather the necessary work and cost information.

iv. To develop the bills of quantities in standardised format.

Upon completion of Coursework 1 and Coursework 2, students will be able to achieve learning outcomes (a), (b) and (c).

Coursework 3

Coursework 3: Students are given a group project to solve the cost estimating problems. This coursework is to assess students' ability:

i. To organise themselves and fellow group members because a surveyor or an engineer must work with others as a team to accomplish the estimating tasks.

ii. To use technical terminologies for work quantification and cost estimation.

iii. To solve a problem or task that is given (e.g., by your employer).

	iv. To demonstrate presentation, communication and writing skills. Through the problem-solving exercises relating to estimating activities (Coursework 3), students will be able to achieve and reinforce learning outcomes (c). **Examination** Examination is used to assess students' understanding of building measurement and cost estimation concepts and practices learned in the lectures and tutorials. Students will be able to achieve learning outcomes (a), (b) and (c). **Effort** Effort given by students in solving the problem exercises given in lectures and tutorials, the students will be able to achieve learning outcomes (a), (b) and (c).	
Student Study Effort Expected	Class contact:	
	▪ Lecture	26 Hrs.
	▪ Seminar / Tutorial	13 Hrs.
	Other student study effort:	
	▪ Student study effort	120 Hrs.
	Total student study effort	159 Hrs.
Reading List and References	Ashworth, A. and Hogg, K. (2007). *Willis's practice and procedure for the quantity surveyor — 12th edition*. Blackwell, Oxford. Buchan, R., Fleming, F.W. and Grant, F.E. (2003). *Estimating for builders and surveyors — 2nd edition*. Butterworth-Heinemann, Oxford. Chan, C.T.W. (2020). *Estimating and measurement for simple building works in Hong Kong*. Routledge. Holroyd, T.M. (2000). *Principles of estimating.* Thomas Telford, London. Packer, A.D. (1996). *Building measurement.* Addison Welsey Longman, Essex. Picken, D.H. and Drew, D.S. (1996). *Building measurement in Hong Kong: Worked Examples*. Longman Asia Ltd., Hong Kong. The Hong Kong Institute of Surveyors (2018). *Hong Kong standard method of measurement of building works — 4th revised edition (HKSMM4R).* The Hong Kong Institute of Surveyors, Hong Kong.	

Subject Description Form

Subject Code	BRE272
Subject Title	Project Supervision and Contract Administration
Credit Value	3
Level	3
Pre-requisite / Co-requisite / Exclusion	Nil
Objectives	This subject is intended to: 1. Enable students to understand the management and supervision of construction works. 2. Enable students to understand the project site, time, cost, quality, safety, information management when delivering construction projects. 3. Enable students to understand the legal context for administrating construction contracts.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: 1. Acquire the knowledge of project and site supervision, time management, cost management, safety management, quality management, and information management. 2. Understand the code of practice and documentation of supervising building works. 3. Apply the general principles of contract law to construction contracts. 4. Interpret and analyse the contractual procedures, rights and duties stipulated in a construction contract. 5. Possess the ability to engage in life-long learning on construction contract law.
Subject Synopsis/ Indicative Syllabus	1. Practices and documents of supervising construction works in relation to time management, cost management, safety management, quality management, and information management. 2. Contractual and common law principles and practices. 3. Characteristics of standard forms of local and international construction contracts. 4. Procedures for instructions, variations, payments, claims and certifications. 5. Responsibilities of contract administrators and works supervisors.

Teaching/Learning Methodology

1. Theories and rationales will be delivered in lecture periods.
2. In-class exercises will be given in lecture periods.
3. Exercises will be given in tutorial periods.
4. Interactive games will be designed and play in tutorial periods.
5. E-learning materials and e-discussion forums will be provided.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed					
		a	b	c	d	e	
1. Coursework 1	25%	√	√				
2. Coursework 2	25%			√	√	√	
3. Examination	40%	√	√	√	√	√	
4. Effort	10%	√	√	√	√	√	
Total	100%						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Coursework 1

Students are given a group assignment relevant to project supervision. Upon completion of Coursework 1, students will be able to achieve learning outcomes (a) and (b).

Coursework 2

Students are given an individual assignment relevant to contract administration. Upon completion of Coursework 2, students will be able to achieve learning outcomes (c), (d) and (e).

Examination

Examination is used to assess students' understanding of concepts and practices learned in the lectures and tutorials. Students will be able to achieve learning outcomes (a), (b), (c), (d) and (e).

Effort

Through students' effort in solving the problem exercises given in lectures and tutorials, the students will be able to achieve learning outcomes (a), (b), (c), (d) and (e).

Student Study Effort Expected	Class contact:	
	▪ Lectures	26 Hrs.
	▪ Tutorials	13 Hrs.
	Other student study effort:	
	▪ Student effort hours	123 Hrs.
	Total student study effort	162 Hrs.
Reading List and References	Buildings Department. (2009). *Code of practice for site supervision*. Hong Kong. Buildings Department. (2009). *Technical memorandum for supervision plans*. Hong Kong. Buildings Department. (2019). *Code of practice for site supervision 2009 amendments*. Circular letter, Hong Kong. Hills, M.J. (2001). *Building contract procedures in Hong Kong*. Longman Hong Kong Education, Hong Kong. Hong Kong Housing Authority. (2017). *PASS (Performance assessment scoring system) manual*. Hong Kong. Hong Kong Institute of Surveyors, the Association of Consultant Quantity Surveyors, and the Hong Kong Construction Association. (2014). *Valuation for interim payment certificates*. Practice Notes for Quantity Surveyors, HKIS and ACQS, Hong Kong. Hong Kong Institute of Surveyors, the Association of Consultant Quantity Surveyors, and the Hong Kong Construction Association. (2012). *Contractual claims*. Practice Notes for Quantity Surveyors, HKIS and ACQS, Hong Kong. Hong Kong Institute of Surveyors, the Association of Consultant Quantity Surveyors, and the Hong Kong Construction Association (2012), *Valuation of variations*, Practice Notes for Quantity Surveyors, HKIS and ACQS, Hong Kong. Hughes, W., Champion, R. and Murdoch, J. (2015). *Construction contracts: law and management.* Routledge, United Kingdom. Poon, S.W., Tang, S.L. and Wong, F.K.W. (2008). *Management and economics of construction safety in Hong Kong*. Hong Kong University Press, Hong Kong. Project Management Institute. (2017). *A guide to the project management body of knowledge*. Newtown Square, Project Management Institute, Newtown Square, Pennsylvania, United States. Tang, S.L., Ahmed, S.M., Aoieong, R.T. and Poon, S.W. (2008). *Construction quality management*. Hong Kong University Press, Hong Kong. Tang, S.L., Poon, S.W., Ahmed, S.M. and Wong, K.W. (2008). *Modern construction project management*. Hong Kong University Press, Hong Kong.	

Subject Description Form

Subject Code	BRE273
Subject Title	Construction and Maintenance Technology
Credit Value	3
Level	2
Pre-requisite / Co-requisite / Exclusion	BRE261, or equivalent
Objectives	1. To identify and understand the construction technology that is available for the construction of contemporary buildings. 2. To provide the necessary skills to allow the evaluation of a range of technologies towards the adoption of an appropriate design, construction and building maintenance decision. 3. To identify and understand the deterioration mechanisms of buildings and to proposed remedies.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Possess knowledge of processes and methods on construction activities. b. Able to use the knowledge and methods for different types of construction. c. Possess knowledge on the code of practice, environmental and safety issues into the construction processes. d. Able to identify the causes of common defects and material deterioration. e. Able to diagnose building defects and propose remedial actions.
Subject Synopsis/ Indicative Syllabus	• Processes and methods of building construction • Deep foundation and basement structures. • Precast concrete construction. • System formworks. • Building deterioration mechanisms. • Concrete properties and its deterioration. • Plastering, tiling and painting. • Dampness in buildings. • Testing and diagnosis of building defects, remedies and prevention. • Environmental and safety issues in construction. • Building repair.

Teaching/Learning Methodology

Interactive lectures, tutorials, seminars and/or laboratory visit are conducted throughout the semester. A lecture schedule outlining the topics to be introduced is distributed to the students at the beginning of the semester. During the lecture period topics are introduced, often with reference to professional journal papers. In tutorial periods, students are required to discuss real-life cases related to the lecture topic and during seminars students are required to present the findings of an assigned research topic. Students will be able to visualize and conduct some tests related to the lecture.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed					
		a	b	c	d	e	
1. Coursework	50%	√	√	√	√	√	
2. Examination	50%	√	√	√	√	√	
Total	100%						

Students will be assessed by:

(i) examination, including problem analysis and essay type question, accounting for 50% and

(ii) through the medium of coursework, including presentation in class of project assignments, accounting for 50%
- 2 individual assignments (20%)
- 1 group project (30%)

Student Study Effort Expected

Class contact:	
▪ Lectures	26 Hrs.
▪ Tutorials	13 Hrs.
Other student study effort:	
▪ Student effort hours	83 Hrs.
Total student study effort	122 Hrs.

Reading List and References	**Indicative Reading List:** Briffett, C. (1995), *Building Maintenance Technology in Tropical Climates*, Singapore University Press. Chew, Y.L.M. (2009) *Construction Technology for Tall Buildings*. 3rd Edition Singapore: Singapore University Press. Chudley, R. (2006) *Advanced Construction Technology* (Rev. ed.) 4th Edition, Longman. Foster J.S. & Greeno R. (2007) *Structure & Fabric – Part II,* 7th Edition, Mitchell, Pearson Prentice Hall. Hinks, J. & Cook, G. (1997), *The Technology of Building Defects,* E. & F.N. Spon. Lee, H.S. & Yuen, C.S. (1993), *Building Maintenance Technology*, MacMillan. Chandler, I. (1991), Repair & Renovation of Modern Buildings, McGraw-Hill Emmitt S. & Gorse C.A. (2010), Barry's Introduction to Construction of Buildings, 2nd Edition, Wiley-Blackwell.

Subject Description Form

Subject Code	BRE274
Subject Title	Work Training and Building Information Modelling (in Summer Semester)
Credit Value	3 Training Credits
Level	2
Pre-requisite	BRE222 and BRE258
Co-requisite	Nil
Objectives	This module aims at providing students an opportunity to 'learn by doing' in terms of participating in real construction site works and setting up building information models for works simulation. It is also intended to enhance development of all-roundness and professional competences of construction students.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Use technical knowledge in construction practices to plan and design method statements for typical construction process. b. Apply basic construction and quality control methods in typical building construction work. c. Use building and construction terminology to communicate and interact effectively with peers and working partners in construction project. d. Review and appreciate building information models. e. Simulate and manipulate construction processes within building information models.
Subject Synopsis/ Indicative Syllabus	1. Site environment and layout. 2. Project progress planning & co-ordination. 3. Engineering design & drawing. 4. Site survey & setting out. 5. Site construction according to design; construction methods. 6. Good construction practices. 7. Construction safety. 8. Quality and quantities control. 9. Site records and documentations. 10. Communication with peers, supervisors and other parties. 11. Application of building information models for site works. 12. Virtual simulation of construction process.
Learning Methodology	The module is in form of a practicum, in which trainees will be highly participative and team playing in a simulated site construction project. Students are provided opportunity to learn about the roles and tasks of a contractor to gain some insight into the construction engineering profession, to provide working environment for construction students to apply their professional knowledge / skills in a real-life situation.

Assessment Methods in Alignment with Intended Learning Outcomes

Assessment Methods	% Weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)				
		a	b	c	d	e
1. Generic Skills	30%	√	√	√	√	√
2. Technical Competence	40%	√	√	√	√	√
3. Reports & Oral Presentation	30%	√	√	√	√	√
Total	100%					

The construction project will be a simulated construction work project administered and constructed by the students. The scope of work will in general involve miscellaneous renovation works, minor works, condition survey and building diagnosis. Students will organize themselves and team-play different roles as in a contractor. At the end of the project, students will present their group projects with a written report and BIM models by an oral presentation.

Student Study Effort Expected

Class Contact	60 Hrs.
Other Study Effort	120 Hrs.
Total Study Effort	180 Hrs.

Reading List and References

Essential Textbooks/ Reading Materials:

The Hong Kong Polytechnic University, (2009). Construction Workshop, Reading Materials for the Training Modules of the Industrial Centre.

Building Information Modeling with Revit Architecture by Simon Greenwold March 2004; 2005−2007 version edits by David Driver

References:

IC BCU Training Materials & Presentation for Construction Students, web site developed by the Industrial Centre for the training module. http://www.ic.polyu.edu.hk/bcu/$Training-materials.htm

Autodesk BIM Resources in Hong Kong
http://www.autodesk.com.hk/adsk/servlet/index?siteID=1170102&id=12949216

Autodesk Education Community
http://students.autodesk.com

The Hong Kong Institute of BIM
http://hkibim.org

Subject Description Form

Subject Code	BRE275
Subject Title	Individual and Integrated Project
Credit Value	5
Level	2
Pre-requisite / Co-requisite / Exclusion	Nil
Objectives	1. Encourage critical investigation, analysis and synthesis in solving problems in the engineering and surveying professional context. 2. Provide an environment for the students to develop skills in identifying and solving problems related to the engineering and surveying profession and allow the integration of knowledge gained in separate subject areas. 3. Provide students with knowledge and skills on Building Information Modeling (BIM), with the assistance and under the mentoring support from relevant professional institution.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Integrate and apply knowledge and skills gained from various subject areas on construction engineering design, technology, management, economics and legal aspects to the case of a particular project. b. Plan and develop the work individually in an effective approach in order to tackle problems related to the engineering and surveying profession in a professional context. c. Communicate effectively technical information in a managerial role, including information collection, proper presentation of analysis and justification of recommended actions. d. Understand and able to apply the knowledge of Building Information Modeling (BIM) in the engineering and surveying practices.
Subject Synopsis/ Indicative Syllabus	A construction and property related project scenario will be set to replicate a situation which could be met in practice. Sometimes the restrictions of the study environment will require the scenario to be modified. The integrated project requires students to make use of the knowledge and skills acquired in Level 2 subjects in various disciplines (e.g. Technology, Economics, Law and Management) to tackle the tasks related to the management, technology and legal aspects as assigned by the respective lecturers. The project will include an element of group effort and individual work assessment.

Teaching/Learning Methodology

The whole class is divided into groups of 8 or 9 students. Each group is to identify and select a building construction site/project to form a common base for project appraisal. Each student also needs to work individually and submit an individual report. The tasks to the students may include evaluating construction IT-related application in HK, such as design review, method statement development, measurement, cost planning and valuation of variations. Briefing sessions via a 'Project Guide' will be conducted to familiarize students with the methodology and areas of consideration for each task. Supervision and consultation will be made available during the entire process. Mid-way through the project interim report and at the end final, Group Report are required for assessment by the relevant supervisors. Towards the end of the Semester II, each student shall submit their own individual work in the form of in-depth study as an Individual Report for a specific topic area in construction with the Supervisor.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)						
		a	b	c	d			
1. Group Report	40%	√	√	√	√			
2. Individual Report	60%	√	√	√	√			
Total	100%							

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

(a) Relevant focus and depth.
(b) Analysis, synthesis and technical competence of construction methods.
(c) Logic of explanation.
(d) Relevance and clarity of sketches.
(e) Communication skills.
(f) Ability of using the BIM software.

Student Study Effort Expected

Class contact:	
▪ Supervision and consultation	13 Hrs.
▪ Project discussion and evaluation	13 Hrs.
Other student study effort:	
▪ Project Work	80 Hrs.
▪ Preparation and material searching	60 Hrs.
Total student study effort	166 Hrs.

Reading List and References	Construction Industry Council (CIC): BIM Standards (Phase One) (September 2015). http://www.cic.hk/eng/main/aboutcic/publications/reference_materials/index.html Smith, D.K. and Tardi, F.M. (2009) Building information modeling: a strategic implementation guide for architects, engineers, constructors, and real estate asset managers, Jolm Wiley and Sons. "Building Information Modelling for Tertiary Construction Education in Hong Kong", Journal of Information Technology in Construction (ITcon), 2011 Vol. 16, pg. 467-476, http://www.itcon.org/2011/27. Wong K.D., Wong K.W., Abid Nadeem. "Government Roles in Implementing Building Information Modelling Systems: Comparison between Hong Kong and the United States", Journal of Construction Innovation: Information, Process, Management, Vol. 11 No. January, 2011 pp. 61-76 Emerald Group Publishing Limited 1471-4175 DOI 10.1108/14714171111104637. Wong K.D., Wong K.W., Abid Nadeem. Autodesk BIM Resources in Hong Kong http://www.autodesk.com.hk/adsk/servlet/index?siteID=1170102&id=12949216 Autodesk Education Community http://students.autodesk.com The Hong Kong Institute of BIM http://hkibim.org

Subject Description Form

Subject Code	BRE315
Subject Title	Property Valuation
Credit Value	3
Level	3
Pre-requisite	Nil
Objectives	This subject is intended to: 1. Understand the nature of the market and property values. 2. Examine the theories of current valuation methods. 3. Solve valuation problems.
Intended Learning Outcomes	Students will demonstrate their ability to: a. Identify the various frameworks, including physical, economic and legal, that affect property value. b. Evaluate the choices of the various valuation approaches and methods in the valuation of different types of property for different types of value estimate. c. Apply current valuation methods to solve valuation problems. d. Identify the use of valuation in the management and decision making process in real estate development, investment and management.
Subject Synopsis/ Indicative Syllabus	**Brief Syllabus Content:** Value and valuation; concepts; economic principles; valuation tables; role of valuer. Real property market data sources: information; market trends and cycles. Valuation process; valuation report writing. Methods of valuation; comparative, investment, residual, cash flow; cost and profits methods. Valuation of freehold and leasehold interests; capital and rental values; theories of yield; deferred and varying incomes; extension and renewal of leases.
Teaching/Learning Methodology	Lectures will be used to provide students with a good understanding of the basic valuation concepts and theories, and will be supplemented with self-learning packages. Wherever possible, case studies will be used to illustrate how principles can be applied into practice. Tutorials will be used by the lecturer and students to discuss valuation problems and assignments while seminars provide suitable forums for presentation by the students. Students are also required to prepare a 'real life' valuation report. Outside speakers will be invited to give talks on current valuation practice in Hong Kong as well as other countries.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c	d	e	
1. Coursework	50%	√	√	√	√		
2. Examination	50%	√	√	√	√		
Total	100%						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Students will be assessed through both coursework and examination.

Coursework will consist of valuation report and problem solving assignments in the form of quiz. Both examination and coursework assess learning outcome a to d.

Student Study Effort Expected

Class contact:	
- Lectures	26 Hrs.
- Seminars / Tutorials	13 Hrs.
Other student study effort:	
- Self-studies and group work	90 Hrs.
Total student study effort	129 Hrs.

Reading List and References

Recommended:

Appraisal Institute (2001). *The Appraisal of Real Estate*, Chicago, Ill.: Appraisal Institute.

Baum, A.E. and Mackmin, D. (2011). *The Income Approach to Property Valuation*, Estate Gazette.

Davidson, A.W. (2013). *Parry's Valuation and Investment Tables*, Estate Gazette.

Isaac, David and O'Leary, John (2013). *Property Valuation Techniques*, Palgrave Macmillan.

Li Ling-hin (2000). *Property Valuation in Hong Kong: Theories and Legal Application*, PACE.

Millington, A.F. (2000). *An Introduction to Valuation*, Estates Gazette.

Poon, T.N.T. and Chan E.H.W. (1998). *Real Estate Development in Hong Kong*, PACE Publishing Limited

Scarrett, Douglas (2016). *Property Valuation in the Five Methods*, E. & F.N. Spon.

Subject Description Form

Subject Code	BRE337
Subject Title	Property Law
Credit Value	3
Level	3
Pre-requisite / Co-requisite / Exclusion	Nil
Objectives	The subject is intended to: 1. Further develop and apply knowledge and reasoning skills. 2. Evaluate and apply property law to factual situations. 3. Examine law relating to property transactions, land use control and compensation.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: Use and understand the legal terms relating to the subject and be able to make use of such terms to communicate effectively. a. Identify and evaluate the key concepts and principles of Hong Kong land law and Conveyancing. b. Compare and contrast the different property concepts. c. Apply knowledge and reasoning skills to solve legal problems relating to ownership and land use control. d. Explore and evaluate problem-solving solutions in the context of land use and development. e. Possess the ability to evaluate property law with reference to contemporary issues.
Subject Synopsis/ Indicative Syllabus	The sequence of learning in this module is organized around two themes, and three topics. The two themes are: 1. Acquisition, transfer and extinction of interests in land in Hong Kong. 2. The control of land use (including both private and public control). The topics are: 1. Vendor/purchaser transactions. 2. The relationship between owners and managers of multi-storey buildings. 3. The relationship of landlord and tenant.

Teaching/Learning Methodology

The teaching methods:

1. Interactive lecturing.

2. The themes and topics are developed through problem-solving activities designed to develop the higher order cognitive skills of analysis, argument and critical judgment. Where appropriate, role plays are used to develop skills and enhance awareness of the role of law in property decisions in Hong Kong.

With the methods, the intended learning outcomes afore-mentioned are achieved.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c	d	e	
1. Coursework	30%	√	√	√	√	√	
2. Written Examination	70%	√	√	√	√	√	
Total	100%						

The course work:
The students are required to select a judgment, which is related to the subjects being taught, and to present the judgment by analyzing the judgment into issues, the related law, the application of the law to the facts as found by the judge and the to summarize the effect of the judgment.

Prior to the presentation, the students are required to submit to the lecturer all materials relating to the presentation.

Towards the end of the presentation, questions are put to the students by the lecturer and the students are required to answer the questions immediately.

The examination:
As regard the examination, students are required to answer both essay type and problem type questions. The questions are relating to what they have learnt.

As a result, whether the intended learning outcomes have been achieved can be assessed from the performance of the students.

Student Study Effort Expected

Class contact:	
▪ Lecture	26 Hrs.
▪ Tutorial	13 Hrs.
Other student study effort:	
▪ Self studying. Preparation for tutorial classes, course work and examination.	127 Hrs.
Total student study effort	166 Hrs.

Reading List and References	**Recommended**: (the latest editions of the following books should be used): Murphy, W.T. and Robert, S. (2004). Understanding Property Law. (4th ed). Sweet Maxwell. S.H., Goo. and Alice, S.C. Lee. (2015). Land Law in Hong Kong. (4th ed). LexisNexis. Sihombing, J. and Wilkinson, M. (2014). A Student's Guide to Hong Kong Conveyancing. (7th ed). LexisNexis. Nield, S. (1997). Hong Kong Land Law. (2nd ed). Addison Wesley Longman China Limited. Merry, M. (2016). Building Management in Hong Kong. (3rd ed). LexisNexis. Merry, M. (2016). Hong Kong Tenancy Law, (6th ed). LexisNexis. John, Litton and Kate, Olley (2018). Planning Law in Hong Kong. LexisNexis. Richard, E. Smith (2006). Planning Control: Development, Permission and Enforcement. RICS Boooks. **Supplementary**: Authorized Hong Kong Law Report and Digest, Sweet & Maxwell. Government Publications. Halsbury Laws of Hong Kong, Butterworths. Hong Kong Cases, Butterworths. **Useful websites:** Polytechnic University library database: Westlaw Department of Legal Justice HK: http://www.doj.gov.hk/eng/legal/index.htm Hong Kong Legal Information: http://www.hklii.org/ Hong Kong e-legislation: https://www.elegislation.gov.hk/

Subject Description Form

Subject Code	BRE349
Subject Title	Building Services I
Credit Value	3
Level	3
Pre-requisite	BRE2031
Objectives	This subject is intended to: 1. Provide students with an overview of the various building services engineering systems in modern buildings, 2. Understand the basic design intent of various building services systems and their integration with the building fabric and architectural features.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Possess a knowledge of the system configuration and operation of various building services systems. b. Relate how different building services systems can help to control and improve the indoor environment. c. Identify the relationships between the design of building services systems and the overall building design. d. Appreciate the cost and value relationship on the selection of appropriate building services systems. e. Relate issues on environmental impact to the design of building services systems and overall building design.
Subject Synopsis/ Indicative Syllabus	Plumbing & Drainage Water supply and drainage system for high rise buildings. Simple design on pipe sizing for plumbing and drainage pipes. Sewage treatment process and fresh water recycling Electricity: Assessment of electricity demand. Lightning protection. Safety and Earthing provisions for electricity distribution within buildings. HVAC: Principles of air-conditioning process. Assessment on the efficiency of air-conditioning and air mixing processes. Large scale air conditioning system configurations and operations. Internal transportation: The configuration and operation of lifts and escalators. Assessment on the quality of services of lift operation.

<table>
<tr><td></td><td>Fire Services: Active prevention, detection and suppression systems for Fire Services. Passive approaches to Fire Services. Integration of fire services system to other building services systems.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>The learning and teaching approaches for the subject comprises lectures, tutorials and laboratories.

Lectures aims at delivering the basic core of concepts and knowledge of respective topics whilst further design and operation arrangements will be elaborated and discussed in the tutorials. Presentation by students on selected topics will also be arranged at tutorials. Laboratories are included to allow students to relate theories and concepts to real situations.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td></td></tr>
<tr><td>1. Laboratory Report</td><td>6%</td><td>√</td><td>√</td><td></td><td></td><td>√</td><td></td></tr>
<tr><td>2. Oral Presentation</td><td>14%</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td></tr>
<tr><td>3. Coursework</td><td>20%</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td></tr>
<tr><td>4. Examination</td><td>60%</td><td>√</td><td>√</td><td>√</td><td></td><td>√</td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="6"></td></tr>
</table>

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Assessment for the subject comprises written examination, oral presentation, case study report and laboratories.

Students must pass both the continuous assessment elements and the end-of-semester examination in order to pass the subject.

Written examination aims to assess students' ability to apply concepts learned for solving problems on building services design and operation.

Oral presentations on specific topics on building services serve to assess students' understanding on the topics chosen.

Coursework in the form of case study report aims to consolidate students' knowledge and relating design of building services system to the overall building design.

Laboratories allow students to relate theories to actual practices and operations.</td></tr>
</table>

Student Study Effort Expected	Class contact:	
	▪ Lecture	26 Hrs.
	▪ Tutorial	13 Hrs.
	Other student study effort:	
	▪ Laboratory	6 Hrs.
	▪ Self-Learning	75 Hrs.
	Total student study effort	120 Hrs.
Reading List and References	**Recommended:** Hall F. & Greeno R. (2017) *Building Services Handbook*, 9th ed., Routledge. Burberry P. (1997) *Environment & Services*, 8th ed., Longman Scientific & Technical. Chadderton D.V. (2013) *Building Services Engineering*, 6th ed., Taylor & Francis. Wang S.K. (2001) *Air Conditioning and Refrigeration*, 2nd ed., McGraw Hill. CIBSE (2000) *Guide D – Vertical Transportation*, CIBSE. **Supplementary:** HKSAR (2015), *Code of Practice for the Electricity (Wiring) Regulations*. HKSAR (2016), *Code of Practice for Fire Safety in Buildings 2011 (2015 edition).* HKSAR (2012), *Code of Practice for Minimum fire Services Installations and Equipment and Inspection, Testing and Maintenance of Installations and Equipment*. HKSAR, *Building Ordinance and Regulations* CAP.123. NFPA (1997) *Fire Protection Handbook*, 18th Edition. BRE (various) *Digests and Current Papers*. Building Research Establishment, Garston, Watford, U.K. Various Standards and Codes published by British Standard Institution (BSI).	

Subject Description Form

Subject Code	AMA1110
Subject Title	Basic Mathematics I – Calculus and Probability & Statistics
Credit Value	3
Level	1
Pre-requisite	Nil
Objectives	This subject aims to introduce students to the basic concepts and applications of elementary calculus and statistics. Emphasis will be on the understanding of fundamental concepts and the use of mathematical techniques in handling practical problems in science and engineering.
Intended Learning Outcomes *(Note 1)*	Upon completion of the subject, students will be able to: a. Apply analytical reasoning to solve problems in science and engineering. b. Make use of the knowledge of mathematical/statistical techniques and adapt known solutions to various situations. c. Apply mathematical modeling in problem solving. d. Demonstrate abilities of logical and analytical thinking.
Subject Synopsis/ Indicative Syllabus *(Note 2)*	Elementary calculus: Limit and continuity, derivatives and their geometric meaning, rules of differentiation including chain rule, Leibniz's rule and L'Hopital's rule, exponential and logarithmic functions, trigonometric functions and their inverses, hyperbolic and inverse hyperbolic functions, applications of differential calculus. Elementary Probability and Statistics: Descriptive statistics, random variables, probability and probability distributions, binomial, Poisson and normal distributions, applications. Population and random samples. Sampling distributions related to sample mean, sample proportions, and sample variances. Concepts of a point estimator and a confidence interval. Point and interval estimates of a mean and the difference between two means.
Teaching/Learning Methodology *(Note 3)*	Basic concepts and elementary techniques of differential and integral calculus, elementary statistics and linear algebra will be taught in lectures. These will be further enhanced in tutorials through practical problem solving.

Assessment Methods in Alignment with Intended Learning Outcomes

(Note 4)

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)			
		a	b	c	d
1. Homework, quizzes and mid-term test	40%	√	√	√	√
2. Examination	60%	√	√	√	√
Total	100%				

Continuous Assessment comprises of assignments, in-class quizzes, online quizzes and a mid-term test. An examination is held at the end of the semester.

Questions used in assignments, quizzes, tests and examinations are used to assess students' level of understanding of the basic concepts and their ability to use mathematical techniques in solving problems in science and engineering.

To pass this subject, students are required to obtain grade D or above in both the continuous assessment and the examination components.

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The subject focuses on understanding of basic concepts and application of techniques in differential/integral calculus, elementary statistics and elementary linear algebra. As such, an assessment method based mainly on examinations/tests/quizzes is considered appropriate. Furthermore, students are required to submit homework assignments regularly in order to allow subject lecturers to keep track of students' progress in the course.

Student Study Effort Expected

Class contact:	
▪ Lectures	26 Hrs.
▪ Tutorials	13 Hrs.
Other student study effort:	
▪ Homework and self-study	81 Hrs.
Total student study effort	120 Hrs.

Reading List and References	Chung, K.C. *A Short Course in Calculus and Matrices*, McGraw Hill 2013. Hung, K.F., Kwan, Wilson, Pong, T.Y. *Foundation Mathematics & Statistics*, McGraw Hill 2013. Larson, R., Edwards, B. *Single Variable Calculus*, Brooks/Cole 2012. Walpole, R.E., Myers, R.H., Myers, S.L., Ye, K. *Probability and Statistics for Engineers and Scientists*, Prentice Hall, 2012.

Note 1: Intended Learning Outcomes
Intended learning outcomes should state what students should be able to do or attain upon completion of the subject. Subject outcomes are expected to contribute to the attainment of the overall programme outcomes.

Note 2: Subject Synopsis/ Indicative Syllabus
The syllabus should adequately address the intended learning outcomes. At the same time over-crowding of the syllabus should be avoided.

Note 3: Teaching/Learning Methodology
This section should include a brief description of the teaching and learning methods to be employed to facilitate learning, and a justification of how the methods are aligned with the intended learning outcomes of the subject.

Note 4: Assessment Method
This section should include the assessment method(s) to be used and its relative weighting, and indicate which of the subject intended learning outcomes that each method purports to assess. It should also provide a brief explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes.

Subject Description Form

Subject Code	CSE20290
Subject Title	Introduction to Geotechnology
Credit Value	3
Level	2
Pre-requisite / Co-requisite / Exclusion	Nil
Objectives	1. Provide students with instruction on the fundamentals of geotechnology. 2. Provide an essential background for studies in soil mechanics, rock mechanics, foundation engineering and geotechnical designs.
Intended Learning Outcomes *(Note 1)*	Upon completion of the subject, students will be able to: a. Understand and classify the different nature and properties of different types of rocks. b. Understand basic soil and rock mechanics. c. Apply the knowledge to foundation designs and construction. d. Interpret the test results of the soil samplings.
Subject Synopsis/ Indicative Syllabus *(Note 2)*	Mineralogy and Petrology (2 week) Physical properties of silicate and non-silicate minerals and their identification; classification of igneous, metamorphic and sedimentary rock and their identification. Hong Kong Rock. Surface processes and Ground-water geology (2 weeks) Weathering; erosion and deposition including river, marine, desert, glacier, karst; formation of engineering soil; hydrological cycle, aquifers and ground water table. Structural geology (1 weeks) Unconformities, fold, fault, joint, map reading and mapping skill. Site investigations (2 weeks) Plan for site investigation; direct and indirect methods for site investigation and sampling, logging of boreholes; insitu tests (e.g. SPT, CPT, PMT, DMT, VST); interpretation of test results. Methods of geophysical exploration. Geology for engineering (2 weeks) Geological applications to tunnels, transportation links, dams, reservoirs, catchments, coastline protection, slopes and foundation. Soil mechanics (2 weeks) Soil formation, Classification of soil, weight–volume relationship, void ratio, porosity, moisture content, specific gravity, unit weight, degree of saturation, consistency of soil and Atterberg limits; compressibility of soil; Darcy's law, permeability; basic concept of shear strength of soil.

	Rock Mechanics (2 weeks) Rock Mass Classification, Uniaxial and triaxial compressive strength, Brazilian test, Point load index, Mohr-Coulomb model with tensile cutoff, and Hoek-and-Brown failure model. Laboratory and Fieldwork Identification of common minerals and rocks, Field and site visits to illustrate course topics, Mapping, Borehole logging.
Teaching/Learning Methodology *(Note 3)*	Fundamental knowledge will be covered in lectures. Tutorial sessions will provide opportunities for identification of minerals & rocks, learning the mapping skill and bore log skill. The students need to complete the work sheets in tutorial sessions. Field studies will help students appreciate the basic principles and familiarize themselves with basic instruments.
Assessment Methods in Alignment with Intended Learning Outcomes *(Note 4)*	

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)							
		a	b	c	d				
1. Continuous Assessment	30%	√	√	√	√				
2. Examination	70%	√	√	√	√				
Total	100%								

Students must attain at least grade D in both coursework and final examination (whenever applicable) in order to attain a passing grade in the overall result.

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The students will be assessed with three components: the tutorial session, field trip session and assignment. Minerals test and rocks test will arrange after about one month of the tutorial session of identification of minerals and rocks, an examination at the end of the semester. The student will be required to attend tutorial sessions and submit individual reports. The tutorial session will strengthen geotechnology knowledge of students include identify minerals & rocks, mapping skill and bore log. The student will be required to attend field trip session and submit field trip report. These field trip sessions will be acquired the creative thinking. Students will have to exert engineering judgement to complete the tutorial and field trip sessions. The assignment, tutorial session and field trip session to together with the report writing are best to achieve intended learning outcomes a), b), c) and d). Minerals test, rocks test will emphasize on assessing student basic concept and current practices of minerals and rocks identification. It is appropriate to achieve intended learning outcome a). The examination will consolidate students learning in lectures. It is appropriate to achieve the intended learning a), b), c) and d).

Student Study Effort Expected	Class contact:	
	▪ Lectures	26 Hrs.
	▪ Tutorials	8 Hrs.
	▪ Field work	5 Hrs
	Other student study effort:	
	▪ Reading and Studying	39 Hrs.
	▪ Completion of Assignments	39 Hrs.
	Total student study effort	117 Hrs.
Reading List and References	Atherton, M.J. and Burnett, A.D., Hong Kong Rocks, Urban Council, 1986. Bell, F.G., Engineering Geology, Second Edition, Butterworth-Heinemann, 2007. Davis, G.H. and Reynolds, S.J., Structural Geology of Rocks and Regions, Second Edition, Wiley, 1996. Das, B.M., Principles of Geotechnical Engineering, Seventh Edition, International Thomson Publishing, 2010. Fletcher, C.J.N., Geology of Site Investigation Boreholes from Hong Kong, C. Fletcher, 2004. Goodman, R.E., Rock Mechanics, Second Edition, Wiley, 1989. Lisle, R.J., Geological Structures and Maps, Third Edition, Butterworth-Heinemann, 2004. Lutgens, F.K. and Tarbuck, E.J., Essentials of Geology, Eleventh Edition, Pearson Prentice Hall, 2012. Mottana, A., Crespi, R. and Liborio, G., Simon & Schuster's guide to Rocks and Minerals, Simon & Schuster, 1978. Raymond, L.A., Petrology: The Study of Igneous, Sedimentary & Metamorphic Rocks, Second Edition, McGraw Hill, 2002. Sewell, R.J., Campbell, S.D.G., Fletcher, C.J.N., Lai, K.W. and Kirk, P.A., The Pre-Quaternary Geology of Hong Kong, Printing Dept., 2000. West, T.R., Geology: Applied to Engineering, Prentice Hall, 1995.	

Note 1: Intended Learning Outcomes

Intended learning outcomes should state what students should be able to do or attain upon completion of the subject. Subject outcomes are expected to contribute to the attainment of the overall programme outcomes.

Note 2: Subject Synopsis/ Indicative Syllabus

The syllabus should adequately address the intended learning outcomes. At the same time over-crowding of the syllabus should be avoided.

Note 3: Teaching/Learning Methodology

This section should include a brief description of the teaching and learning methods to be employed to facilitate learning, and a justification of how the methods are aligned with the intended learning outcomes of the subject.

Note 4: Assessment Method

This section should include the assessment method(s) to be used and its relative weighting, and indicate which of the subject intended learning outcomes that each method purports to assess. It should also provide a brief explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes.

Subject Description Form

Subject Code	ELC3421
Subject Title	English for Construction and Environmental Professionals
Credit Value	3
Level	3
Pre-requisite	LCR English subjects
Objectives	This subject aims to develop the English language skills required by students to communicate effectively in their future careers.
Intended Learning Outcomes *(Note 1)*	Upon completion of the subject, students will be able to: a. plan, organise and produce effective workplace correspondence; b. interact professionally in job interviews; c. participate actively in workplace discussions; and d. plan, organise and produce professional technical documents. 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.
Subject Synopsis/ Indicative Syllabus *(Note 2)*	This syllabus is indicative. The balance of the components, and the corresponding weighting, will be based on the specific needs of the students. 1. **Professional portfolio and technical documents** Improving comprehension of technical texts; understanding and applying organisation structures and language features to produce professional technical documents such as proposals and portfolios; achieving cohesion and coherence; using an appropriate style, format, structure and layout. 2. **Job interviews and work-related discussions** Practising the specific verbal and non-verbal skills required in job-seeking interviews for communication with potential employers, and in workplace discussions with a range of participants such as co-workers, clients and staff of government departments. 3. **Workplace correspondence** Selecting and using relevant content; organising ideas and information; maintaining appropriate tone, distance and level of formality; achieving cohesion and coherence; using an appropriate style, format, structure and layout. 4. **Language appropriacy** Using context-sensitive language in spoken and written English. 5. **Language development** Improving and extending relevant features of grammar, vocabulary and pronunciation.

Teaching/Learning Methodology

(Note 3)

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. Contexts that involve the different fields of construction, surveying and property management, and environmental management will be used in the teaching and learning activities. 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 Methods in Alignment with Intended Learning Outcomes

(Note 4)

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)			
		a	b	c	d
1. Workplace correspondence	30%	✓			
2. Job interview and discussion	40%		✓	✓	
3. Professional portfolio for chartered assessment	30%				✓
Total	100 %				

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

This subject adopts the method of 100% out of class assessment. 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.

Student Study Effort Expected

Class contact:	
▪ Online seminars	39 Hrs.
Other student study effort:	
▪ Classwork-related, assessment-related, and self-access work	78 Hrs.
Total student study effort	117 Hrs.

Reading List and References

Required reading

Course materials prepared by the English Language Centre

	Recommended readings Beer, D. F. (Ed.). (2003). *Writing and speaking in the technology professions*: *A practical guide* (2nd ed.). Hoboken, NJ: Wiley. Bilbow, G. T. (2015). *Business writing for Hong Kong* (4th ed.). Hong Kong: Pearson Education Asia. Block, J. A., & Betrus, M. (2014). *Great answers, great questions for your job interview* (2nd ed.). New York: McGraw-Hill Education Houp, K. W., Pearsall, T. E., Tebeaux, E. & Dragga, S. (2006). *Reporting technical information* (11th ed.). New York: Oxford University Press. Krannich, C. R. & Krannich, R. L. (2003). *Interview for success: A practical guide to increasing job interviews, offers, and salaries*. Manassas Park, VA: Impact Publications. Lindsell-Roberts, S. (2004). *Strategic business letters and e-mail*. Boston: Houghton Mifflin. Northey, M. & Jewinski, J. (2009). *Making sense: A student's guide to research and writing: Engineering and the technical sciences* (3rd ed.). Don Mills, Ontario: Oxford University Press. Reep, D. C. (2011). *Technical Writing: Principles, strategies and readings* (8th ed.). Boston: Longman.

Subject Description Form

Subject Code	LSGI2961
Subject Title	Engineering Surveying
Credit Value	3
Level	2
Pre-requisite / Co-requisite / Exclusion	Nil
Objectives	Provide students with elementary concept and practice of modern surveying instruments and methods, and their applications for construction projects.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: Category A - Professional/academic knowledge and skills a. Able to master the elementary concept and methods of engineering surveying. b. Able to operate basic and modern surveying instruments. c. Able to collect, analyse and report basic survey data for the design and construction of civil and building infrastructures. Category B - Attributes for all-roundedness d. Students' communication skill and cooperative attitudes of work with others will be developed through group field practical.
Subject Synopsis/ Indicative Syllabus	**Syllabus Content:** *Fundamentals of Surveying* Geomatics and surveying. Survey reference systems. Measurement errors. *Distance Measurements* Tape measurement and corrections. Offset surveying by taping. Electromagnetic distance measurement and corrections. *Angular Measurements* Optical and electronic digital theodolites. Basic features of a typical theodolite. Operation, observation procedures and data reduction. *Height Measurements* Optical and digital levelling instruments. Basic features of a typical levelling instrument. Operation, observation procedures, and data reduction. *Position Determination* Height determination: ordinary and trigonometric levelling. Horizontal position determination: radiation and resection methods. *Satellite Surveying* Concept of satellite surveying. 3-D position determination by Global Navigation Satellite Systems (GNSS).

Horizontal and Vertical Control Surveys
Concept of control survey. Specifications. Monumentation. Traverse computation, quality check and adjustment. Height control establishment by ordinary levelling, quality check and adjustment. Establishment of horizontal and vertical controls by GPS.

Detail Survey
Detail surveying using modern survey instruments and GNSS.

Engineering Surveying
Road alignments: Horizontal alignment: straight, circular, transition curves.
Vertical alignment: Parabolic curve. Super-elevation in road/railway design.
Area and cross sections. Earthwork volume computation.
Setting out.

Teaching/Learning Methodology

Teaching and learning will be basically lectures and reinforced by tutorials and field practical. In order to consolidate students learning, in-class exercise will be given in tutorials. Group discussion is encouraged for the possible solutions to the in-class exercise, followed by the concluding session at the end of the tutorial.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c	d		
1. Examination	60%	√	√	√			
2. Coursework	40%	√	√	√	√		
Pass both components	Yes						
Total	100%						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The coursework assessments include a practical test and a mini project to reinforce the concepts taught in lectures.

Student Study Effort Expected

Class contact:	
▪ Lecture (2 Hrs per session)	26 Hrs.
▪ Practical work (3 Hrs in Weeks 4-9; 6 Hrs in Weeks 10-13)	42 Hrs.
Other student study effort:	
▪ Self-study and practical on equipment operation	64 Hrs.
Total student study effort	132 Hrs.

Reading List and References	**Recommended:** Schofield, W. (2007). *Engineering Surveying,* 6th ed. Butterworth-Heinemann. Uren, J. and Price, W. F. (2006). *Surveying for Engineers*, 4th ed. Palgrave Macmillan

Note 1: Intended Learning Outcomes
Intended learning outcomes should state what students should be able to do or attain upon completion of the subject. Subject outcomes are expected to contribute to the attainment of the overall programme outcomes.

Note 2: Subject Synopsis/ Indicative Syllabus
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