THE HONG KONG POLYTECHNIC UNIVERSITY
DEPARTMENT OF BUILDING AND REAL ESTATE

Part-Time Degree Programmes

For Student Intake 2012/2013

BSc (Hons) in Building Engineering & Management (32102)

BSc (Hons) in Surveying (32107)

September 2012

Contents

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

Department of Building and Real Estate
Faculty of Construction and Environment

September, 2012

Part-time Degree Programmes

1. GENERAL INFORMATION

University	:	The Hong Kong Polytechnic University (PolyU)
Faculty	:	Faculty of Construction and Environment (FCE)
Host Department	:	Department of Building and Real Estate (BRE)
Programme	:	BSc (Hons) in Building Engineering & Management (BEM) BSc (Hons) in Surveying (SUV)
Duration	:	Four Years normally Eight years maximum
Mode of Attendance	:	Part-time (evenings)
System	:	Credit-based System (CbS)

The Department of Building and Real Estate, under the Faculty of Construction and Land Use is the host department for these programmes. BSc (Hons) in Building Engineering and Management is fully accredited by the Institution of Engineers (HKIE), the Chartered Institute of Building (CIOB) and the Hong Kong Institute of Construction Managers (HKICM). BSc (Hons) in Surveying is accredited by the Hong Kong Institute of Surveyors.

Other departments and centres within the University that contribute to the programmes are the English Language Centre (ELC), Civil & Structural Engineering (CSE) and Building Services Engineering (BSE). The Department operates its academic programmes using the Credit-based System. Each programme comprises a number of subjects, expressed in credits. All programmes are upon based University academic year. Under the Credit-based System, an academic year consists of three semesters: Semester 1, Semester 2 and the summer term. For Semesters 1 & 2, each of which usually consists of 14 weeks and is followed by examination period. Between these two semesters, there is a semester break. Summer term is of 7-week duration and usually begins in June.

2. CREDIT REQUIREMENT AND DURATION

2.1 There are a defined number of credits for each programme of which students have to register for each semester in accordance with the programme curriculum.

2.2 Students of any programmes are not allowed to have nil subject registration in any semester, including the mandatory summer term as required by their programmes unless they have obtained approval from the Department. The legitimate reasons for nil subject enrolment must be provided for the consideration of the Department. Any semester in which a student is allowed to take nil subjects will be counted towards the maximum period of registration.

2.3 A student is required to register for a programme at the time of admission. The graduation requirement for each programme is stipulated in the programme curriculum with a normal duration of 4 years (part-time) and a maximum duration for completion of 8 years.

3. PROGRESSION PATTERN

3.1 There is a specified progression pattern and curriculum for each academic programme. Notwithstanding any alterations, which the Department may consider necessary from time to time, students are expected to follow the progression pattern and curriculum unless special approval has been granted. ***PROGRESSION PATTERNS*** (See Appendix A & B) contain details of the prescribed progression pattern for each of the two programmes under this Part-time Degree Scheme.

3.2 Students may apply for deferment of study if they have a genuine need to do so, such as illness or an overseas business trip. Approval from the Scheme Chair and Programme Leader are required. The deferment period will not be counted as part of the maximum period of registration.

4. PROGRAMME OUTCOME

4.1 Programme Aims of BSc (Hons) in Building Engineering & Management

The BEM programme aims to produce graduates who can develop into highly competent and professional building engineers for Hong Kong, China and the international market. It aims to equip students with the knowledge and ability in the production of buildings and facilities so that they will be able to contribute effectively to project and facilities management teams engaged in complex building projects.

Programme Outcomes

Upon successful completion of the programme, the graduate is expected to have acquired the:

Category A Professional/academic knowledge and skills

1. Ability to possess knowledge of building engineering principles, process and methods for the successful completion of all types of construction projects
2. Ability to use the techniques, skills and engineering principles for different types of construction
3. Ability to apply construction management knowledge and skills in personnel, financial and operation practices and communication aspects required for efficient building production
4. Ability to identify, structure and analysis diverse problems arising from the changing social, economic, environmental and technological pressures
5. Ability to solve identified construction problems with appropriate solutions
6. Ability to evaluate alternative strategic options
7. Ability to select appropriate construction materials, practices and methods in compliance with sustainable development
8. Ability to exercise professional judgement in the consideration of alternatives in complex situations

Category B Attributes for all-roundedness

1. Ability to possess skills to identify, analysis and solve problems
2. Ability to have an understanding of professional, social and ethical responsibilities
3. Ability to communicate effectively
4. Ability to reflect knowledge gap for life time learning
5. Ability to contribute as team member and to lead effectively.
6. Ability to identity contemporary issues.

4.2 Programme Aims of BSc (Hons) in Surveying

The Programme aims to prepare students with fundamental knowledge and skills in the inter-disciplinary professions of land, property and construction for their immediate employability and lifelong learning. Graduates will enter the professions of building surveying, quantity surveying, practice surveying or planning and development as graduate trainees but with full potentials to readily become full-fledged professional surveyors and finally take leading and strategic roles in the profession and business of land, property and construction and make contributions to the community through their chosen professional services.

Programme Outcomes

Upon successful completion of the programme, the students and expected to have acquired the:

Category A Professional/academic knowledge and skills

1. Ability to comprehend and identify issues and problems concerning land, property and construction at project level
2. Ability to comprehend and identify issues and problems concerning land, property and construction at corporate level
3. Ability to comprehend and identify issues and problems concerning land, property and construction at industry level
4. Ability to comprehend and identify issues and problems concerning land, property and construction at macro socio-economic and political level
5. Ability to advise clients through rendering surveying services
6. Ability to identify, formulate and solve problems related to the surveying profession and real estate
7. Ability to analyse and interpret data of the industry
8. Ability to formulate and implement strategies, policies and solutions for sustainable development and construction

Category B Attributes for all-roundedness

1. Ability to possess skills to identify, analysis and solve problems
2. Ability to have an understanding of professional, social and ethical responsibilities
3. Ability to communicate effectively
4. Ability to reflect on knowledge gap for life time learning
5. Ability to contribute as team member and to lead effectively
6. Ability to identify contemporary issues

5. PROGRAMME MANAGEMENT

5.1 Departmental Undergraduate Programme Committee / Scheme Committee

Chairman: Scheme Chair
Members: Head, Department of Building and Real Estate (ex-officio)
Programme Leaders
Deputy Programme Leaders
Subject Leaders
One student representatives from each level of the 2 Part-time BSc (Hons) Programmes (except where confidentiality is involved) and
Co-opted additional members from contributing departments
Secretary: Departmental Executive Officer

The Programme Committee is responsible to the Faculty Board for the management of its programme, which includes:

(a) Ensuring that the Programme is implemented properly;
(b) Recommending to the Heads of the host and contributing departments the resources required to implement the programme;
(c) Reviewing programme objectives and resources allocation requirements;
(d) Reviewing the progress of students and the teaching and learning activities and solve any problems arising therefrom;
(e) Reviewing academic regulations, admissions policy, and assessment methods;
(f) Consulting students from time to time.

5.2 Programme Management Group

The Programme Management Group is given the responsibility to monitor and control the running of the programme. The Group comprises the Programme Leader and Programme Counselor. The Group meets three or four times a year to consider the progress of the students as well as receiving comments from the various subject leaders on proposed changes to the programme.

5.3 Head/Student Liaison Meeting

A Head/Student Liaison Meeting, made up of the Head of Department and two student representatives from each level of the programme, shall be held every year to discuss issues of concern. This provides a forum for full and frank exchanges of view.

5.4 Staff/Student Liaison Group

The Student/Staff Liaison Group, made up of two student representatives from each level of the programme, the Programme Counselor, and the Programme Leader, meets twice a year to discuss such issues as student workload, teaching methods and the relevance of the materials taught. This Liaison Group provides a forum for the full and frank exchange of views between staff and students.

5.5 Programme Leader

The Programme Leader is responsible for the day-to-day management of a particular programme and provides academic and organisational leadership for that programme through the Programme Committee and Programme Management Group. Programme Counselor assists the Programme Leader.

6. SUBJECT MANAGEMENT

6.1 Subject Leader

The BRE Department adopts a team approach to teaching. Subjects are normally delivered by more than one lecturer with one of the team designated as the Subject Leader responsible for the development of the subject and for co-ordinating the activities of the lecturers involved.

6.2 Subject Syllabus

Syllabus details are provided in ***SUBJECT PORTFOLIO***. Each subject has an allocated credit value (usually but not necessarily 3 credits) and, in terms of effort, a student is expected to do 40 hours of study to earn a credit.

6.3 Subject Levels

The credit-based subjects are classified according to the University Credit-based System. Each subject is given a unique code that identifies the department offering the subject, the intellectual level and the discipline. For example, subject code BRE201 consists of the letter prefix "BRE" identifying the department offering the subject, and in this case it is the Department of Building & Real Estate; "2" indicating that it is a level 2 subject; and "01" indicating the coding of that particular subject. The level codes are as follows:

Level code		Explanation
0	=	Sub A-Level standard
1	=	A-Level standard
2	=	Standard comparable to Year 1 of a 3-year honours degree programme
3	=	Standard comparable to Year 2 of a 3-year honours degree programme
4	=	Standard comparable to the final year of a 3-year honours degree programme
5	=	Master's level
6	=	Doctoral level

Although the level codes 2 to 4 are for undergraduate degrees, other awards may also use subjects with level codes 2 to 4 if the level of the subject is considered to be appropriate for the level of award. Therefore, level 2 subjects, level 3 subjects and level 4 subjects may be included in some sub-degree or master programmes, whilst level 5 subjects may be included as elective subjects in some undergraduate degree programmes (the latter is restricted to a maximum of 9 credits).

6.4 Requisites and Exclusions

Each subject may have pre-requisites, co-requisites and exclusions. The pre-requisite of a subject must have been obtained before a student registers for that subject. However, the Department has the discretion to waive the pre-requisite requirements of a subject, if deemed appropriate. If a subject X has a subject Y as a co-requisite, both X and Y must be taken in the same semester. And, if subject X has subject Y as exclusion, a student having completed subject Y cannot have subject X counted towards the award.

6.5 Credit Transfer and Exemption

6.5.1 Credit Transfer will be given credits for recognized previous study, which will count towards the award requirement. University policy stipulates that not more than 50% of the normal credit requirement for the academic award may be transferable from approved institutions outside the University, and not more than 67% of the normal credit requirement credits for the award can be transferred from programmes within the University. However, for the two part-time programmes covered by this scheme, there is the additional stipulation that no more than 14 credits in total for BSc (Hons) in Building Engineering & Management and 17 credits in total for BSc (Hons) in Surveying may be transferred from other programmes either inside or outside of the University. The reason for this stipulation is that in order to comply with the requirement of the professional bodies, students on a part-time degree programme basis should study at least 50% of the subjects studied by their full-time counterparts.

6.5.2 Exemption from taking subjects means that the credits associated with the exempted subjects will not count towards the award requirement. If a student is exempted from taking a specified subject because they have previously successfully completed similar subjects in another programme, another subject will have to be taken in order to satisfy the credit requirement.

7. ASSESSMENT

General Assessment Regulations (GAR) of the University governs the conditions for student assessment and progression and the recommendation of an award.

7.1 Assessment Methods

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

(a) Coursework only: To pass a subject by this method, 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 this method a student must attain a minimum Grade 'D' in coursework and a minimum Grade 'D' in the examination.

(c) Continuous Assessment: Both Projects and Dissertation 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. Refer to the 'Guidance Notes for the Final Year Dissertation' for details on the assessment and process.

Assessment methods and parameters are determined by the Subject Leader who will inform the students of the details at the beginning of each semester.

7.2 Subject Assessment Review Panel

The Subject Assessment Review Panel (SARP) is responsible for monitoring the academic standard and quality of subjects and ratifying subject grades. It meets at the end of each semester, normally in January and June. The Panel reviews the distribution of grades within a subject and finalises the grades at the end of each semester/term before submission to the Board of Examiners. The Board of Examiners will not attempt to change any grades.

Composition of the SARP is as follows:

Chairman: Head, Department of Building and Real Estate

Members: Undergraduate Programme Committee Chairperson
Associate Head (Teaching)
Examination Officer (Quality)

Secretary: Departmental Senior Executive Officer

7.3 Grading

At the end of each semester students will be informed of the grade achieved for each subject. Assessment grades shall be awarded on a criterion-referenced basis. A student's overall performance in a subject shall be graded as follows:

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

Subject passing grades are "A+" to "D" whilst "F" is a subject failure grade. No credit will be earned if a subject is failed. At the end of each semester/term, a Grade Point Average (GPA) will be computed as follows, and based on the grade point of all the subjects (failed subjects are included in the GPA calculation).

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

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

Exempted, ungraded or incomplete subjects and subjects for which credit transfer has been approved without a grade assigned to, it will be excluded from the GPA calculation. In addition, subjects from which a student has been allowed to withdraw (i.e. those with the code 'W") will be excluded. Subject which has been given an "S" code i.e. absent from examination, will be included in the GPA calculation and will be counted as "zero" grade point. GPA is therefore the unweighted cumulative average calculated for a student, for all relevant subjects taken from the start of the programme to a particular point of time. GPA is an indicator of overall performance and is capped at 4.0.

7.4 Absence from an assessment component

A student who has been absent from an examination, or other form of assessment, due to illness or other causes acceptable to the SARP, may be given another examination or other form of assessment, which will be regarded as a first assessment for grading purposes. This assessment shall take place before the commencement of the following academic year. In the cases of illness, the student will be required to submit a medical certificate.

7.5 Retaking Subjects

Students may retake any subject for the purpose of improving their grade without having to seek approval, but they must retake a compulsory subject which they have failed, i.e. obtained an F grade. Retaking of subjects is with the condition that the maximum study load of 21 credits per semester is not exceeded. Students wishing to retake passed subjects will be accorded a lower priority than those who are required to retake (due to failure in a compulsory subject) and can only do so if places are available.

The number of retakes of a subject is not restricted. Only the grade obtained in the final attempt of retaking (even if the retake grade is lower than the original grade for originally passed subject) will be included in the calculation of the Grade Point Average (GPA). (The grades obtained in previous attempts will only be reflected in the transcript of studies.)

In cases where a student takes another subject to replace a failed elective subject, the fail grade will be taken into account in the calculation of the GPA, despite the passing of the replacement subject.

8. BOARD OF EXAMINERS

8.1 Responsibilities

The Board of Examiners (BoE) meets at the end of each semester, following the Subject Assessment Review Panel (SARP). The BoE is responsible to the Senate for making decisions concerning:

a) Classification of awards;
b) De-registration cases; and
c) Cases with extenuating circumstance.

The BoE will not attempt to change the grades for any student in any subject or condone failures. Decisions of the BoE, except those on award and de-registration cases which are straight forward, will be ratified by the Faculty Board. Any decisions by the BoE outside the general assessment regulations of the University supported by the Faculty Board, should be referred to the Academic Regulations Committee for ratification, all such cases shall be reported to the Senate. Decisions by BoE outside the programme regulations but within the general assessment regulations of the University fall within the authority of the Faculty Board.

8.2 Composition of BoE

The composition of the BoE is as follows:

Chairman:	Head, Department of Building and Real Estate
Members:	Associate Head (Teaching)
	Undergraduate Programme Committee Chairperson
	The Programme Leader
	Programme Counselors
	4 to 5 internal subject examiners
	Departmental Academic Advisor and/or External Examiners
Secretary:	Departmental Senior Executive Officer

8.3 Appeals

Appeals against the decision of the Subject Assessment Review Panel / Board of Examiners must be made within 7 working days upon the public announcement of the examination results. A student should make the appeal in writing firstly to the Head of the BRE Department. The Department will inform the student of the appeal result and, if the appeal is successful, the Department will inform the Faculty.

9. PROGRESSION AND AWARD

9.1 Progression

At the end of each semester, the Board of Examiners determines whether each student is:
(i) Eligible for progression towards an award; or
(ii) Eligible for an award; or
(iii) Required to be de-registered from the programme.

A student will have 'progressing' status unless he falls within the following categories, either of which may be regarded as grounds for de-registration from the programme:
(i) the student has exceeded the maximum period of registration;
(ii) the student's GPA is lower than 2.0 for two consecutive semesters and his Semester GPA in the second semester is also lower than 2.0; or
(iii) the student's GPA is lower than 2.0 for three consecutive semesters.

Notwithstanding, a student may be de-registered from the programme before the 'third' semester if his academic performance is poor to the extent that the BoE deems his chance of attaining a GPA of 2.0 at the end of the programme is slim or impossible.

9.2 Graduate Requirements

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

(i) Accumulation of the requisite number of credits for the particular award, as defined in the definitive programme document; and
(ii) Satisfying the residential requirement for at least 1/3 of the credits to be completed for the award he is currently enrolled, unless the professional bodies stipulate otherwise; and
(iii) Satisfying all requirements as defined in the definitive programme document and as specified by the University; and
(iv) Having a Grade Point Average (GPA) of 2.0 or above at the end of the programme; and
(v) Satisfying other requirements as stipulated in the definitive programme document e.g. Work-integrated education (WIE), co-curricular activities (CCA), GSLPA and other language requirements.

A student is required to graduate as soon as all the conditions for award are satisfied.

9.3 Guidelines for Award Classification

The following are guidelines for the Boards of Examiners' reference in determining award classifications. The BoE will exercise its judgement as to the award for each student and may use other relevant information.

Hons Degrees	**All other Programmes**	**Guidelines**	**GPA or weighted GPA (see Note)**
1st	Distinction	The student's performance/attainment is outstanding, and identifies him/her as exceptionally able in the field covered by the programme in question.	3.7+ to 4
2:i	Credit	The student has reached a standard of performance/attainment which is more than satisfactory but less than outstanding.	3.2 + to 3.7-
2:ii	Pass	The student has reached a standard of performance/attainment judged to be satisfactory, and clearly higher than the "essential minimum" required for graduation.	2.3+ to 3.2-
3rd		The student has attained the "essential minimum" required for graduation at a standard ranging from just adequate to just satisfactory.	2.0 to 2.3-

Note: "+" sign denotes 'equal to and more than'; "-" sign denotes 'less than'.

9.4 A Pass-without-Honours degree award will be recommended only under exceptional circumstances. For example, the student has demonstrated a level of final attainment which is below the 'essential minimum' required for graduation with Honours from the programme in question. In such a case, though he has nonetheless covered the prescribed work of the programme in an adequate fashion, he fails to show sufficient evidence of the intellectual calibre expected of Honours degree graduates.

Appendix A

PROGRESSION PATTERN

BSc (Hons) in Building Engineering & Management **32102**

Total credits for the PT Building Engineering & Management Programme is 62 credits.##
Unless otherwise specified, subjects are compulsory and carry 3 credits

Year 1 [*September 2012*]
Semester 1
BRE391 Construction Technology II
CSE290 Introduction to Geotechnology
Semester 2
BRE351 Contract Administration
BRE349 Building Services I
#ELC3403 Workplace English for FCLU *(3 credits)*

Year 2 [*September 2013*]
Semester 1
BRE302 Structure II
BRE3931 Temporary Work Design (4 credits in 4 semesters including Year 2: S.1, S.2 and summer term and Year 3: S1)
Semester 2
BRE324 Engineering Economics
BRE350 Project Management & Procurement
BRE3931 Temporary Work Design (4 credits in 4 semesters including Year 2: S.1, S.2 and summer term and Year 3: S1)

Year 3 [*September 2014*]
Semester 1
BRE377 Research Methods
BRE3931 Temporary Work Design (4 credits in 4 semesters including Year 2: S.1, S.2 and summer term and Year 3: S1)
BRE401 Construction Technology III
BRE4051 Project Evaluation & Development (5 credits in 2 semesters)
Semester 2
BRE345 Measurement, Documentation & Estimating
BRE4051 Project Evaluation & Development (5 credits in 2 semesters)
BRE453 Building Services II
BRE477 Dissertation (*6 credits in 4 semesters including Year 3: S2, Summer Semester, Year 4: S1 & Year 4: S2*)

Year 4 [*September 2015*]
Semester 1
BRE426 Geotechnical & Foundation Engineering
BRE477 Dissertation (*6 credits in 4 semesters including Year 3: S2, Summer Semester, Year 4: S1 & Year 4: S2*)
Semester 2
BRE4281 Construction Engineering Management
BRE477 Dissertation (*6 credits in 4 semesters including Year 3: S2, Summer Semester, Year 4: S1 & Year 4: S2*)

ELECTIVES* 2 Elective Subjects
Students are to opt two electives either in S.1 or S.2 from the list of the elective subjects offered by the Department and as specified.
Elective Subjects :
At least one elective from the following:
BRE398 Building Information Modeling
BRE326** Maintenance Technology & Management
BRE450*** Building Maintenance for Sustainability
BSE332 Fire Services
Only one elective from the following:
BRE442 Forecasting and Competition in the Built Environment
BRE439 Engineering Contract Procedure

Total credits = 62

Students can opt for BRE326 **prior to taking BRE 450.
***Students who have opted for BRE 450 **prior** to BRE 326, they will **not** be allowed to opt for BRE 326 afterwards.

ELC3404 (1 credit) Job Application Skills shall be taken exclusively by the PolyU Higher Diploma holders obtaining credit transfer of ELC3401 (2 credits) only instead of ELC3403.

The Department reserves the rights to review/revise the subjects offered and time of offer.

Appendix B

PROGRESSION PATTERN

BSc (Hons) in Surveying **32107**

Total credits for the PT Surveying Programme is 65 credits.#

Unless otherwise specified, subjects are compulsory and carry 3 credits.

Year 1
Semester 1 (September 2012)

BRE217	Planning & Development
BRE315	Property Valuation

Semester 2

BRE326	Maintenance Technology & Management
BRE337	Property Law
#ELC3403	Workplace English for FCLU *(3 credits)*

Year 2
Semester 1 (September 2013)

BRE329	Construction Contract Law
BRE341	Property Management I

Semester 2

BRE345	Measurement, Documentation & Estimating
BRE347	Urban & Construction Economics
BRE350	Project Management & Procurement
BRE346	Integrated Project IIA *(4 credits in 3 semesters including Year 2: S2 & summer term & Year 3: S1)*

Year 3
Semester 1 (September 2014)

BRE336	Development Control Law
BRE346	Integrated Project IIA *(4 credits in 3 semesters including Year 2: S2 & summer term & Year 3: S1)*
BRE377	Research Methods
BRE441	Professional Studies *(5 credits in 2 semesters)*

Semester 2

BRE319	Property Investment & Finance
BRE441	Professional Studies (5 credits in 2 semesters)
BRE477	Dissertation (*6 credits in 4 semesters including Year 3: S2, Summer Semester, Year 4: S1 & Year 4: S2*)

ELC3404 (1 credit) Job Application Skills shall be taken exclusively by the PolyU Higher Diploma holders obtaining credit transfer of ELC3401 (2 credits) only instead of ELC3403.

Year 4
Semester 1 (September 2015)

BRE477 Dissertation (*6 credits in 4 semesters including Year 3: S2, Summer Semester, Year 4: S1 & Year 4: S2*)

***BS Discipline – Specific Elective Subject:**
BRE415 Dispute Resolution

***QS Discipline – Specific Elective Subjects:**
BRE415 Dispute Resolution
BRE440 Cost and Value Management
BRE442 Forecasting & Competition in the Built Environment

***GP Discipline – Specific Elective Subjects:**
BRE4291 Real Estate Marketing
BRE436 Applied Property Valuation

Semester 2

BRE477 Dissertation (*6 credits in 4 semesters including Year 3: S2, Summer Semester, Year 4: S1 & Year 4: S2*)

***BS Discipline – Specific Elective Subjects:**
BRE435 Design, Adaptation & Conversion
BRE437 Facility Management
BRE349 Building Services I

***QS Discipline – Specific Elective Subjects:**
BRE439 Engineering Contract Procedure

***GP Discipline – Specific Elective Subjects:**
BRE418 Real Estate Development
BRE427 Applied Property Investment

***1. Surveying students are required to opt ONE Discipline from the 3 surveying disciplines offered by the Department.**

2. Students are required to complete the 12 credits of the 3 Disciplines – Specific Elective Subjects in particular to their choices of disciplines.

Total credits: 65

The Department reserves the rights to review/revise the subjects offered and time of offer.

Curriculum Mapping: BSc (Hons) in Building Engineering & Management

This curriculum map gives a holistic view of the degree to which each intended learning outcome will be taught and assessed in your programme.

The following indicators (I, R, A) to show the treatment of the programme outcome in a subject:

I (Introduced) That the learning leading to the particular intended outcome is introduced in that subject.
R (Reinforced) That the learning leading to the particular intended outcome is reinforced in that subject.
A (Assessed) That the performance which demonstrates the particular intended outcome is assessed in that subject

Level 3 Subjects

		Subject Codes														
	Programme Outcomes List programme outcomes in this column in the same order as in the outcomes section for easy referencing	BRE302	BRE324	BRE326 (E)*	BRE345	BRE349	BRE350	BRE351	BRE391	BRE3931	BSE332 (E)	IC301	ELC3401			
A1	To possess knowledge of building engineering principles, processes and methods for the successful completion of all types of construction projects	IR				IA	RA	A	RA		IA	IR				
A2	To use the techniques, skills and engineering principles for different types of construction	IRA			IA	RA			RA		IA	IRA				
A3	To apply construction management knowledge and skills in personnel, financial and operational practices and communication aspects required for efficient building production			I			RA	A	I							
A4	To identify, structure and analyse diverse problems arising from the changing social, economic, environmental and technological pressures		IA						I		I					
A5	To solve identified construction problems with appropriate solutions	IRA		IA	IA	RA	RA		I	RA						

	Programme Outcomes List programme outcomes in this column in the same order as in the outcomes section for easy referencing	BRE302	BRE324	BRE326 (E)*	BRE345	BRE349	BRE350	BRE351	BRE391	BRE3931	BSE332 (E)	IC301	ELC3401			
A6	To evaluate alternative strategic options	R	IA	IA		RA	RA		R	IR						
A7	To select appropriate construction materials, practices and methods in compliance with sustainable development	I		IA					I	IRA	IR					
A8	To exercise professional judgement in the consideration of alternatives in complex situations	IR						R				IR				
	All-rounded Attributes															
B1	To possess skills to identify, analyse and solve problems		RA	I	IA	RA	A	A	IR	A	IA	IR				
B2	To have an understanding of professional, social and ethical responsibilities	I						I	I		IR					
B3	To communicate effectively			I	IA	RA	A	A		A		IRA	IRA			
B4	To reflect on knowledge gap for life time learning							R			IR					
B5	To contribute as team member and to lead effectively	R	RA	I		RA	A	I								
B6	To transfer and replicate knowledge and skills to other industries/ domains							I			I					
B7	To identify contemporary issues			I		I				I	IR	I				

* (E) = Elective

Level 4 Subjects

		Subject Codes														
	Programme Outcomes List programme outcomes in this column in the same order as in the outcomes section for easy referencing	BRE401	BRE426	BRE428	BRE439 (E)	BRE442 (E)	BRE499	BRE4051	BSE453	CSE431 (E)						
A1	To possess knowledge of building engineering principles, processes and methods for the successful completion of all types of construction projects	RA	IR		A			RA	RA							
A2	To use the techniques, skills and engineering principles for different types of construction	A	IRA	R	R	IA	A		RA	RA						
A3	To apply construction management knowledge and skills in personnel, financial and operational practices and communication aspects required for efficient building production			RA	R			RA								
A4	To identify, structure and analyse diverse problems arising from the changing social, economic, environmental and technological pressures	IR		RA		IRA	RA	R								
A5	To solve identified construction problems with appropriate solutions	RA	IRA				RA	R	RA	IRA						
A6	To evaluate alternative strategic options						RA	R								
A7	To select appropriate construction materials, practices and methods in compliance with sustainable development	IR					R	R								
A8	To exercise professional judgement in the consideration of alternatives in complex situations		I	R			RA	RA								

Appendix C

	Programme Outcomes List programme outcomes in this column in the same order as in the outcomes section for easy referencing	BRE401	BRE426	BRE428	BRE439 (E)	BRE442 (E)	BRE499	BRE4051	BSE453	CSE431 (E)						
	All-rounded Attributes															
B1	To possess skills to identify, analyse and solve problems	RA			A	RA	A	A	RA	IA						
B2	To have an understanding of professional, social and ethical responsibilities		I		R	IA		R	R							
B3	To communicate effectively	A		RA	R	RA	A	RA								
B4	To reflect on knowledge gap for life time learning	I		R		I	IRA	IRA								
B5	To contribute as team member and to lead effectively		RA			I		R								
B6	To identify contemporary issues			R			A	R	R	IR						

Curriculum Mapping : BSc (Hons) in Surveying

This curriculum map gives a holistic view of the degree to which each intended learning outcome will be taught and assessed in your programme.

The following indicators (I, R, A) to show the treatment of the programme outcome in a subject:

I	(Introduced)	That the learning leading to the particular intended outcome is introduced in that subject.
R	(Reinforced)	That the learning leading to the particular intended outcome is reinforced in that subject.
A	(Assessed)	That the performance which demonstrates the particular intended outcome is assessed in that subject

Level 2 Subjects

		Subject Codes														
	Programme Outcomes List programme outcomes in this column in the same order as in the outcomes section for easy referencing	BRE2031	BRE206	BRE216	BRE217	BRE218	BRE291	BRE2921								
A1	To comprehend and identify issue and problems concerning land, property and construction at project level	IA	I		I		IA									
A2	To comprehend and identify issue and problems concerning land, property and construction at corporate level		IR													
A3	To comprehend and identify issue and problems concerning land, property and construction at industry level	I	I	IA		I										
A4	To comprehend and identify issue and problems concerning land, property and construction at macro socio-economic and political level	I	A		I											
A5	To advise clients through rendering surveying services	I				I										
A6	To identify, formulate and solve problems related to the surveying profession and real estate industry		I			I	IA	IA								
A7	To analyse and interpret data of the industry	IA				I	IA									

Appendix D

	Programme Outcomes List programme outcomes in this column in the same order as in the outcomes section for easy referencing	BRE2031	BRE206	BRE216	BRE217	BRE218	BRE291	BRE2921								
A8	To formulate and implement strategies, policies and solutions for sustainable development and construction	I														
	All-rounded Attributes															
B1	To possess skills to identify, analyse and solve problems	IA	A		I	IA	IA	I								
B2	To have an understanding of professional, social and ethical responsibilities		I					IA								
B3	To communicate effectively	IA	A	IA	R	IA	IA	IA								
B4	To reflect on knowledge gap for life time learning		I													
B5	To contribute as team member and to lead effectively	IA		IA			I									
B6	To transfer and replicate knowledge and skills to other industries/ domains		I													
B7	To identify contemporary issues					I										

Level 3 Subjects

		Subject Codes														
	Programme Outcomes List programme outcomes in this column in the same order as in the outcomes section for easy referencing	BRE315	BRE319	BRE326	BRE329	BRE336	BRE337	BRE341	BRE345	BRE346	BRE347	BRE350	BRE391	BRE349 (DSE)*	IC301	ELC3401
A1	To comprehend and identify issue and problems concerning land, property and construction at project level	IRA		IA	A	IR	I		IA	RA	RA	RA	RA	IA	IR	
A2	To comprehend and identify issue and problems concerning land, property and construction at corporate level		IA		R		I	I		RA			R			
A3	To comprehend and identify issue and problems concerning land, property and construction at industry level		IA	IA	I	RA	A				RA		RA			
A4	To comprehend and identify issue and problems concerning land, property and construction at macro socio-economic and political level			I			R	I		R			I			
A5	To advise clients through rendering surveying services	A		I	A	I	I		I			RA	R	I	IRA	
A6	To identify, formulate and solve problems related to the surveying profession and real estate industry	A	IA	IA	R	A	R			RA			RA	IA		
A7	To analyse and interpret data of the industry	A	IA						IR		IA			IA		

Appendix D

	Programme Outcomes List programme outcomes in this column in the same order as in the outcomes section for easy referencing	BRE315	BRE319	BRE326	BRE329	BRE336	BRE337	BRE341	BRE345	BRE346	BRE347	BRE350	BRE391	BRE349 (DSE)	IC301	ELC3401
A8	To formulate and implement strategies, policies and solutions for sustainable development and construction			I			I			R			I		I	
	All-rounded Attributes															
B1	To possess skills to identify, analyse and solve problems		IA	I	A	R	A	R	IA	A	RA	A	IR	RA	IR	
B2	To have an understanding of professional, social and ethical responsibilities	R			R		R			R			I		I	
B3	To communicate effectively	R		I	A	RA	R	I	IA	A	RA	A		RA	IRA	IRA
B4	To reflect on knowledge gap for life time learning				I	I	I									
B5	To contribute as team member and to lead effectively			I						RA		A		RA		
B6	To transfer and replicate knowledge and skills to other industries/ domains						I									
B7	To identify contemporary issues		IA	I		I				I	IA			I	I	

*(DSE) = Discipline - Specific Elective Subject

Level 4 Subjects

		Subject Codes														
	Programme Outcomes List programme outcomes in this column in the same order as in the outcomes section for easy referencing	BRE441	BRE499	BRE415 (DSE)*	BRE418 (DSE)	BRE427 (DSE)	BRE4291 (DSE)	BRE435 (DSE)	BRE436 (DSE)	BRE437 (DSE)	BRE439 (DSE)	BRE440 (DSE)	BRE442 (DSE)			
A1	To comprehend and identify issue and problems concerning land, property and construction at project level	RA	RA	A		A		IRA	A		A	RA	RA			
A2	To comprehend and identify issue and problems concerning land, property and construction at corporate level	RA	RA					I		A	A	RA	IA			
A3	To comprehend and identify issue and problems concerning land, property and construction at industry level		RA	A		A		RA	A		R		RA			
A4	To comprehend and identify issue and problems concerning land, property and construction at macro socio-economic and political level		RA		A		A	R		A			IA			
A5	To advise clients through rendering surveying services					A	A	R			R		RA			
A6	To identify, formulate and solve problems related to the surveying profession and real estate industry	A	A	R		A	A	R	A				I			
A7	To analyse and interpret data of the industry	R	A	A	A			RA					RA			

	Programme Outcomes List programme outcomes in this column in the same order as in the outcomes section for easy referencing	BRE441	BRE499	BRE415 (DSE)	BRE418 (DSE)	BRE427 (DSE)	BRE4291 (DSE)	BRE435 (DSE)	BRE436 (DSE)	BRE437 (DSE)	BRE439 (DSE)	BRE440 (DSE)	BRE442 (DSE)			
A8	To formulate and implement strategies, policies and solutions for sustainable development and construction	R						RA				I				
	All-rounded Attributes															
B1	To possess skills to identify, analyse and solve problems	R	A	R			A	R	R	A	A	RA	RA			
B2	To have an understanding of professional, social and ethical responsibilities			I		R	R	RA	R		R		IA			
B3	To communicate effectively	RA	A	A	A	R	R	RA	R	R	R	RA	RA			
B4	To reflect on knowledge gap for life time learning		IRA	I				R					I			
B5	To contribute as team member and to lead effectively	R		A				RA					I			
B6	To identify contemporary issues	R	A	R				RA								

*(DSE) = Discipline - Specific Elective Subject

Level 2 Subjects:

BRE 217	Planning and Development
CSE 290	Introduction to Geotechnology

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 underlying forces governing the development of urban form in modern cities. 2. Review the planning and development control system in Hong Kong. 3. Evaluate government policies and regulations on land uses.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a) Analyze the 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 conflict between conservation and real estate development and the limitations of urban planning. d) Communicate and work effectively with various professionals involved in the land development process
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.

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. Student projects	30%	✓	✓	✓	✓		
2. Written Examination	70%	✓	✓	✓			
Total	100 %						

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

Student Study Effort Expected

Class contact:	
▪ Lectures	21 Hrs.
▪ Seminars	21 Hrs.
Other student study effort:	
▪ Readings	60 Hrs.
▪ Group discussion and project works	60 Hrs.
Total student study effort	162 Hrs.

Reading List and References

Levy, John M. (2009) Contemporary Urban Planning, Pearson/Prentice Hall

Ratcliffe, John (2009) Urban Planning and Real Estate development, Routledge

Hong Kong SAR Government, Planning and Lands Bureau (2007) Hong Kong 2030: Planning Vision and Strategy – Final Report

Hong Kong Institute of Planners, *Planning and Development*, Journal of the HKIP, various issues

Hong Kong Institute of Planners (1996) Planning in Hong Kong Kong 1997 and Beyond

Lai, Wai-chung, Ho, Chi-wing, Leung, Hing-fung (2004) Change in use of land : a practical guide to development in Hong Kong, Hong Kong University Press

Nissim, R. (2008) *Land Administration and Practice in Hong Kong*, Hong Kong University Press

Hong Kong Government (1991) Comprehensive Review of the Town Planning ordinance, Consultative Document, Hong Kong Government Printer

The Hong Kong Polytechnic University

Subject Description Form

Subject Code	CSE290
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	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	*Mineralogy and Petrology* Minerals, Crystals; physical properties of silicate and non-silicate minerals and their identification. Igneous, sedimentary and metamorphic rock, composition, rock classification and their identification. Hong Kong Rocks. *Surface processes and weathering* Weathering of rock, erosion and deposition; hydrological cycle (River, Marine, Wind, Glacial). *Structural geology* Fold, Fault and joints, stereographic projection of joint; map reading and mapping, section of geological structures. *Site investigation* Plan for site investigation; direct and indirect methods for site investigation and sampling, logging of boreholes in situ test (e.g. SPT, CPT, PMT, DMT, DMT,VST); interpretation of test results. Methods of geophysical exploration. *Geology for engineering* Geological application to tunnels. Transportation links, dams, reservoirs and catchments, coastline protection, slope and foundation. *Soil mechanics* Soil classification, 3 phase model , mass –volume relationship, void ratio, porosity, moisture content, specific gravity, unit weight, degree of saturation, soil consistency and Atterberg limits; soil hydraulics; basic concept of shear strength. *Rock Mechanics*

<table>
<tr><td></td><td>Index properties of rock for engineering, classification of rock masses; rock strength and failure criteria; rock slope stability.

Laboratory and Fieldwork
Identification of common minerals and rocks. Field and site visits to illustrate course topics, Mapping.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Fundamental knowledge will be covered in lectures. Laboratory work will provide opportunities for identification of minerals & rocks, learning the mapping skill and bore log skill, the students need to complete the work sheets. Field studies will help student appreciate the basic principles and familiarize themselves with basic instruments.</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="8">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><td></td><td></td></tr>
<tr><td>1.Continuous Assessment</td><td>30%</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td><td></td><td></td><td></td></tr>
<tr><td>2. Examination</td><td>70%</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Total</td><td>100 %</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
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 laboratory session, field trip session and assignment. Minerals test and rocks test will arrange after about one month of the laboratory session of identification of minerals and rocks, an examination at the end of the semester. The student will be required to attend laboratory sessions and submit individual laboratory reports. The laboratory 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 individual field trip report. These field trip sessions will be acquired the creative thinking. Students will have to exert engineering judgement to complete the laboratory and field trip sessions. The assignment, laboratory 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).</td></tr>
<tr><td>Student Study</td><td>Class contact:</td><td></td></tr>
</table>

Effort Expected	▪ Lecture	21 Hrs.
	▪ Tutorial	14 Hrs.
	▪ Field work	7 Hrs
	Other student study effort:	
	▪ Reading and studying	44Hrs.
	▪ Completion of Assignments	30Hrs.
	Total student study effort	120Hrs.
Reading List and References	Glyth F.G.H. and de Freitas M.H., *A Geology for Engineers*, 7th Edition, ELBS, 1984 Allen P.M. and Stephens E.A., *Report on the Geological Survey of Hong Kong*, Government Press, Hong Kong (1971) Bell F.G., *Engineering Geology and Geotechnics*, Butterworths, 1980 Bell F.G., *Fundamentals of Engineering Geology*, Butterworths, 1983 GEO, *Guide to Rock and Soil Descriptions*, GeoGuide 3, GCO, Civil Engineering Services Department, Hong Kong, 1988 GEO, *Guide to Site Investigation*, GeoGuide 2, GEO, Geotechnical Engineering Office, Civil Engineering Department, 1987 Hoek E. and Bray J., *Rock Slope Engineering*, 3rd Edition, The Institution of Mining and Metallurgy: London, 1980 Holmes A., *Principles of Physical Geology*, 3rd Edition, Nelson, 1978 Langford R.L., Hans A. and Shaw R., *Karst Geology in Hong Kong*, Geological Society of Hong Kong Bulletin, No. 4, 1990 Legget and Karrow, *Handbook of Geology in Civil Engineering*, McGraw-Hill, 1982 Smith M.J. (1986) *Concise Soil Mechanics*, 4th Edition, McDonald and Evons Rahn P. H. (1996) *Engineering Geology, An Environmental Approach*, Prentice Hall.. West T. R. (1995) *Geology Applied to Engineering*, Prentice Hall.	

Subject Description Form

Subject Code	BRE302
Subject Title	Structure II
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	AMA290 & BRE204, or their equivalents
Objectives	Consolidate the knowledge gained in Structure I and to extend this knowledge to include structural principles as related to design/construction of structural elements in building works. At the end of this subject, the student is expected to be able to design building structural elements and appreciate the design of temporary steelworks.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a) Appreciate the structural design principles in limit state design and their applications to the design of permanent building structures according to the " Code of Practice for the Structural Use of Steel 2005" and the "Code of Practice for Structural Use of Concrete 2004 (Second Edition)", published by the Buildings Department of Hong Kong SAR. b) Design and analyze the basic types of steel structural members and connections. c) Design and analyze the basic types of Reinforced Concrete (RC) members. d) Appreciate the design of temporary steelworks/RC Works in building construction, tower crane erection in particular. e) Improve on problem-solving skills, communication skills in written format, teamwork spirit in professional context.
Subject Synopsis/ Indicative Syllabus	*Design Concept* Limit states design: ultimate limit states and serviceability limit states, load combination. *Structural principles applied to the use of structural steel design* Structural steel design to the *Code of Practice for the Structural Use of Steel 2005*. Tension members, beams (laterally restrained and unrestrained), columns, beam-columns, welded and bolted connections. *Structural principles applied to the use of reinforced concrete design* Reinforced concrete design to the *Code of Practice for Structural Use of Concrete 2004*: singly and doubly reinforced concrete beams, shear reinforcement, simply supported slabs, one-way continuous slab, compression members under axial load and moment, average and local bond stresses. *Temporary works engineering* Basic principles, Codes, Standards and Regulations related to the design and erection of temporary steelworks.

Teaching/Learning Methodology

Interactive lectures will enable students to understand the basic design concepts and learn how to design basic structural members with due consideration to their service conditions;

Tutorial will enable students to consolidate the structural design concept through design problem-solving assignments and discussions;

Laboratory works will enable students to identify, through a loading test, the structural behavior of a full-scale simply supported steel beam subjected to bending;

Demonstrations at the Industrial Center will enable students to appreciate the quality control and nondestructive tests on the structural steel welding.

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. Assignments	35	✓	✓	✓	✓	✓	
2. Mid-term Exam	15	✓	✓				
3. Final exam	50	✓	✓	✓	✓		
Total	100 %						

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

The students will be assessed through their independently completed assignments, which contribute to 35%, a fair percent for exercise/learning/assessment; mid-term and final exams will contributes to 65%, which is used to assess the learning results of individual student; the lab report will be prepared and assessed in small groups, which is counted as a part of the assignments.

Student Study Effort Expected

Class contact:	
▪ LEC	21 Hrs.
▪ TUT/LAB	21 Hrs.
Other student study effort:	
▪ SELF-STUDY/ASSIGN	120 Hrs.
▪	Hrs.
Total student study effort	162 Hrs.

Reading List and References

Recommended:

MacGinley, T.J. and Choo, B.S. (1990). *Reinforced concrete: design theory and examples*, E & FN Spon, London. Available in NetLibrary through PolyU Library.

Moseley W.H., Bungey J.H., Hulse R. (1997). *Reinforced Concrete Design*, 5th Edition, Macmillan.

MacGinley, T.J. and Ang, T.C. (2004). *Structural Steelwork: design to limit state theory*, 3rd Edition, Elsevier Butterworth-Heinemann, Jordan Hill, Oxford.

	Nethercot, D.A. (2001). *Limit states design of structural steelwork,* 3rd edition, Spon Press. Available in NetLibrary through PolyU Library. Currie B., Sharp R.A. (1990). *Structural Design*, Stanley Thornes, Surrey, UK. Ratay R.T. (1996*). Handbook of temporary structures in construction – Engineering, Standards, Design, Practices and Procedures*, 2nd Edition, McGraw-Hill. Shaprio H.T., Shaprio J.P., Shaprio L.K. (1999). *Cranes and Derricks*, 3rd Edition, McGraw-Hill. Skinner H., Watson T., Dunkley, B. and Blackmore P. (2005). *Tower crane stability*, final contractor's report, CIRIA, UK. **Supplementary:** *Structural Use of Concrete - BS 8110: Part 1,* 1997, British Standards Institution. *Code of Practice for the Structural Use of Steel,* Buildings Department, Government of HKSAR, 2005. *Steelwork Design Guide to BS 5950: Parts 1 and 2.* The Steel Construction Institute and The British Constructional Steelwork Association Limited, UK. *Construction Sites (Safety) Regulation, Cap. 59,* HKSAR. *Factories and Industrial Undertaking Ordinance, Section 6A &* 6B – General Duties, HKSAR. *Factories and Industrial Undertaking (lifting Appliance and lifting Gear) Regulation*, HKSAR. *Code of Practice for Safe Use of Mobile Cranes & Tower Cranes*, Labour Dept., HKSAR. *Code of Practice for Safe Use of Cranes BS7121: Parts1 & 2,* British Standards Institution.

Subject Description Form

Subject Code	BRE315
Subject Title	Property Valuation
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	BRE216 and BRE217/ Nil / 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	**Learning Outcomes:** *Students will demonstrate their ability to:-* 1. Identify the various frameworks, including physical, economic and legal, that affect property value. 2. Evaluate the choices of the various valuation approaches and methods in the valuation of different types of property for different types of value estimate. 3. Apply current valuation methods to solve valuation problems. 4. 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. Valuation methods adopted in the People's Republic of China and overseas.
Teaching/Learning Methodology	Lecturers 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 1 to 4.

Student Study Effort Expected

Class contact:	
▪ Lecture	21 Hrs.
▪	Hrs.
Other student study effort:	
▪ Seminar/ Tutorial	21 Hrs.
▪	Hrs.
Total student study effort	42 Hrs.

Reading List and References

Recommended:

Johnson, T. T. (2000) *Modern Methods of valuation of land, houses and buildings*, Estates Gazette

Li Ling-hin, (1999) *Property Valuation in Hong Kong: Theories and Legal Application*, PACE

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

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

Brown, G.T., "Real Estate Cycles Alter the Valuation Perspective", *The Appraisal Journal*, October 1984, 539-549

	Supplementary: Issac, D., & Steley, T., (2000) *Property Valuation Techniques*, Macmillan Baum, A., & Crosby, N., (1995), *Property Investment Appraisal*, Routledge Davidson, A.W., (1989) *Parry's Valuation and Investment Tables*, Estate Gazette

Subject Description Form

Subject Code	BRE319
Subject Title	Property Investment and Finance
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Pre-requisite: BRE216
Objectives	1. Enable students to understand key financial theories and the analytical techniques related to investment decisions. 2. Foster students' awareness and understanding of property finance and the use of real-estate related financial instruments in today's context.
Intended Learning Outcomes	Upon completion of the subject, students should be able to: a. use financial theories to assess a landed property as an investment asset with regard to its risk and return, b. draw upon the implications of financial planning on property investment decisions, c. appraise alternative investments within the context of Hong Kong, including both direct and indirect real estate investments and other financial instruments, d. interpret and evaluate the financial strength of real estate companies, e. possess skills to identify, analyze and solve problems on contemporary issues in the Hong Kong real estate and financial markets.
Subject Synopsis/ Indicative Syllabus	<u>Property Finance</u> An overview of capital markets, the different financial systems and different financing tools available. An introduction of financial accounting including principal accounting concepts, financial statement composition and interpretation, and financial ratio analysis. Capital structure, implication of gearing and tax advantage. <u>Property Investment</u> Investment concepts and principles; investment vehicles; comparison between property investment and financial investment vehicles (including both direct and indirect property investments). Investment appraisal techniques. Portfolio analysis, diversification and capital market theory, risk and return in property and financial investments.
Teaching/Learning Methodology	The methods of teaching comprise: 1. Formal lectures for explaining the principles of property finance and investment from which students can get an understanding of the financial theories and their applications to the landed property in Hong Kong. Each lecture is at 1.5 hrs per week for a period of 14 weeks. 2. Seminars and tutorials for students to present and discuss the key financial concepts and their applications contained in selected Journal papers and articles, and on contemporary issues of Hong Kong property and financial markets. Case studies are also conducted to discuss various topical issues with real examples in the seminars. Each seminar/tutorial is at 1.5 hrs per week in small groups for a total period of 14 weeks.

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. Presentation / Group Report	50%	√	√	√	√	√	
2. Examination	50%	√	√	√	√		
Total	100 %						

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

Individual presentation in seminars and tutorials and group reports (50%) can help create an environment that encourages active learning among students, consolidate their understanding on the topics and enable application of theories in key and contemporary issues through discussion and argument, so that the Intended Learning Outcomes from a. to e. can be achieved by going through the learning process.

Assessment criteria for individual presentation include: oral presentation skill, familiarity with the topic, quality of visuals and responses to questions during discussion. Assessment criteria for group reports include: written communication skills, data/information collection, data interpretation and analysis, identification of problem/issue and conclusion.

Examination (50%) is used to test whether the students have acquired the financial techniques and analytical skills for performing investment appraisals, including the ability for performing the tasks stated in the Intended Learning Outcomes from a. to d.

Student Study Effort Expected

Class contact:	
▪ Lectures	21 Hrs.
▪ Seminars / tutorials	21 Hrs.
Other student study effort:	
▪ Independent study	120 Hrs.
Total student study effort	162 Hrs.

Reading List and References

Reading List:

Brown, G.R. and Matysiak, G.A. (2000). *Real Estate Investment: A Capital Market Approach*, Prentice Hall.

Brealey, R.A. and Myers, S.C. (2004). *Principles of Corporate Finance,* McGraw Hill.

Mott, Graham (1999). *Accounting for Non-Accountants – A Manual for Managers and Students*, Kogan Page.

Wild, J.J.; Subramanyam, K.R. and Halsey, R.F. (2003). *Financial Statement Analysis,* 8th Edition, McGraw-Hill.

	Brueggeman, W.B. and J.D. Fisher. (1993), *Real Estate Finance and Investments*, Boston: Irwin, 9th Edition. Brett, M. (1992). *Property and Money,* Estates Gazette. Dubben, N. and Sayce, S. (1991). *Property Portfolio Management: An Introduction,* Routledge, New York. Ho, Y.K. (Ed), (1991). *The Hong Kong Financial System,* Oxford University Press. Lumby, Steve, (1994). *Investment Appraisal and Financial Decisions (5th edition),* Chapman & Hall. Millington, A.F. (1994). *An Introduction to Property Valuation (4th Edition),* Estates Gazette. Norfolk, W. (1981). Accounting for the Building Trade, Hutchinson Educational Ltd. **Supplementary:** Clauretie, T.M. and Sirmans, C.S. (1996). *Real Estate Finance: Theory and Practice*, New Jersey: Prentice-Hall. Fraser, W.D. (1993). *Principles of Property Investment & Pricing (2nd edition),* Macmillan, Great Britain. Calatchi, R.F. and Rosenberg, S.B. (Eds) (1992). *Property Finance: An International Perspective*, London: Euromoney Books. Scott, R.H. (Ed), (1986). *Hong Kong's Financial Institutions and Markets,* Oxford University Press. Sin, S.F. (1987). *Building Project Finance in Hong Kong: Law and Practice,* Butterworth. Upson, A., (1987). *Financial Management for Contractors*, BSP. Weston, J.F., (1986). *Managerial Finance*, Dryen Press.

Subject Description Form

Subject Code	BRE324
Subject Title	Engineering Economics
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	Engineers are members of one of the principal 'spending professions' in the sense that they carry responsibility for the design and production of infrastructure and the built environment. Economic analysis as applied to engineering and construction is concerned with pursuing the better use of resources, and providing the analytical support for decisions about achieving value for money and choosing between competing alternatives that will give us a sustainable future. *This subject is intended to:* Equip students with theories and analytical skills necessary to make well informed decisions.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Identify, structure and analyse diverse problems arising from the changing social, economic, environmental and technological pressures b. Evaluate alternative strategic options c. Describe the size and market structure of the property and construction industries are and consequently to understand why construction and real estate has played an important role on economic development, particularly in the case of Hong Kong d. Undertake financial feasibility of engineering projects e. Possess skills to identify, analyse and solve problems f. Contribute as team member and to lead effectively
Subject Synopsis/ Indicative Syllabus	*Engineering/Construction Economics*: Relationship between the construction and engineering sector and the economy. Globalization of capital markets. Demand for construction. Pricing mechanism for construction or engineering projects. Financial aspects of different contract strategies. Design economics. Whole life costing. Value Management. *Principles of Project Appraisal*: Time value of money. Net present value and internal rate of return. Project investment appraisal and feasibility studies. *Risk and Uncertainty*: Capital budgeting. Risk analysis and estimation of risk premiums, Probabilistic techniques for project appraisal. Weighted average cost of capital. *Budgeting and Cost Control:* Cumulative expenditure and revenue curves. Design and production cost control. *Cost and Break-even Analysis:* Fixed costs, variable costs. Working capital. Cost control curves. Calculation of break-even point.

Teaching/Learning Methodology

1st seven weeks

Students spend half of their total contact hours in mass lectures, and another half in seminars. Lectures 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 lecturers can be further illustrated, exemplified and elaborated.

2nd seven weeks

- Interactive lectures with discussions and Q&A to test students understanding before starting a new topic
- Use of videos to introduce concepts and pose discussions during tutorials
- Quiz to test students understand on this subject
- Sharing and discussions in tutorials
- Use both local and overseas real-life case studies to facilitate understanding and appreciation of real-life practices

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	f
1. Group project	25%	√	√	√	√	√	√
2. Quiz	25%	√	√			√	
3. Examination	50%	√	√	√	√	√	
Total	100 %						

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

1st seven weeks

To access the learning outcome of "financial feasibility of engineering projects", students did a group project modified from sample questions of the Chartered Financial Analyst Institute. A pass in this assignment would demonstrate their ability to apply their knowledge in financial analysis at a level that is commensurate with that required by an international professional body.

2nd seven weeks

To access the learning outcome of various topics covered in the 2nd seven week, students did quiz at the end of the 7th lecture in order to assess their overall learning for different topics. A pass in this quiz (would demonstrate their ability to apply their knowledge in using various tools for construction/infrastructure project assessment.

Student Study Effort Expected	Class contact:	
	• lectures	21Hrs.
	• tutorials	21Hrs.
	Other student study effort:	
	• reading from recommended texts / materials provided in e-learning system	23 Hrs.
	• group project / quiz preparation	55 Hrs.
	Total student study effort	120 Hrs.
Reading List and References	Ashworth A. (2010) "*Cost Studies of Buildings"*, Pearson. Harris F., McCaffer, R. & Edum-Fotwe, F. (2006) "*Modern Construction Management*", Blackwell. Kelly J., Male S. & Graham D. (2004) *"Value Management of Construction Projects",* Blackwell Science. Kelly J., Morledge R. & Wilkinson S. (2002) *"Best Value in Construction"*. Blackwell Science. Pilcher R. (1994) " *Project Cost Control in Construction*", BSP. Poon T.N.T. & Chan E.H.W. (1998) *"Real Estate Development in Hong Kong",* PACE. Raftery J. (1994) *"Risk Analysis in Project Management"*, E & FN Spon. Tang S.L. (2003) *"Economic Feasibility of Projects: Managerial and Engineering Practice"*, Chinese University Press. *Various materials provided in the designated e-learning management system.*	

Subject Description Form

<table>
<tr><td>Subject Code</td><td>BRE326</td></tr>
<tr><td>Subject Title</td><td>Maintenance Technology & Management</td></tr>
<tr><td>Credit Value</td><td>3</td></tr>
<tr><td>Level</td><td>3</td></tr>
<tr><td>Pre-requisite / Co-requisite/ Exclusion</td><td>Pre-requisites : BRE291 or BRE294</td></tr>
<tr><td>Objectives</td><td>1. To strengthen students' building technology knowledge with particular focus on the repair and maintenance disciplines;
2. To give students a basic knowledge on how to manage the maintenance works efficiently and effectively.</td></tr>
<tr><td>Intended Learning Outcomes</td><td>Upon completion of the subject, students will be able to:
<table>
<tr><th>Item</th><th>Intended Professional Learning Outcomes</th></tr>
<tr><td>1.</td><td>identify the causes of common defects and material deterioration.</td></tr>
<tr><td>2.</td><td>diagnose building defects and propose remedial actions.</td></tr>
<tr><td>3.</td><td>monitor and supervise the quality of maintenance work.</td></tr>
<tr><td>4.</td><td>understand the principles and execution of maintenance planning and management.</td></tr>
<tr><td>5.</td><td>evaluate maintenance needs and execute the work effectively.</td></tr>
</table></td></tr>
<tr><td>Subject Synopsis/ Indicative Syllabus</td><td><u>Maintenance Technology :</u>
Deterioration of common building materials – mechanisms and protection
Typical deteriorating factors for reinforced concrete in Hong Kong
Common defects of building elements
Health and environmental issues in building maintenance
Testing and diagnosis of building defects, remedies and prevention

<u>Maintenance Management & Planning :</u>
Types of maintenance, classifications and selection criteria
Maintenance planning and scheduling: budgeting, resources allocation and timing of maintenance
Alternative methods on executing of maintenance works: direct labour and contract out
Contract procurement for maintenance works
Safety and environmental considerations for maintenance works
Relationship between design and maintenance; feedback on design
Life cycle costing concept on selection of alternatives</td></tr>
</table>

Teaching/Learning Methodology

Interactive Lectures will enable students to:

1. understand the deterioration mechanisms of common building materials and causes of building defects (A1)
2. be able diagnose the causes of building defects and to rectify the defects (A2, A3)
3. analyse and compare alternatives in the process of building repair (A4,A5)
4. apply the theories and concepts to upkeep the healthy condition of the building stocks (A3,A4)

Tutorial will enable students to:

1. consolidate the knowledge on technological and managerial concepts used in the building repair industry through problem-solving assignments, case study and discussions. (A1, A2, A3, A4, A5, B1, B2, B3 & B4)

Laboratory will enable students to:

1. identify the appropriate tests to diagnose defects (A1, A2, B1)

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		1	2	3	4	5	
1. Coursework	30%	✓	✓	✓	✓	✓	
2. Examination	70%	✓	✓	✓	✓	✓	
Total	100 %						

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

Students could demonstrate their understanding on the subject through the preparation of coursework and presentation. Problem-based learning and case study approach will be used.

Students' overall understanding of the subject will be assessed in the examination, on both the theoretical knowledge and practical application.

Student Study Effort Expected

Class contact:	
▪ Lecture	21 Hrs.
▪ Tutorial	21 Hrs.
Other student study effort:	
▪ Self-development	57 Hrs.
▪ Coursework preparation	21 Hrs.
Total student study effort	120 Hrs.

Reading List and References

Recommended:

Briffett, C., (1995), *Building Maintenance Technology in Tropical Climates,* Singapore University Press

	Buildings Department, HKSAR, (2002), *Building Maintenance Guidebook*, HKSAR The Chartered Institute of Building, (1990), *Maintenance Management: a Guide to Good Practice*, CIOB Chanter, B & Swallow, P., (2007), *Building Maintenance Management*,*2nd ed*, Blackwell 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 Lee, R., (1987), *Building Maintenance Management*, 3rd ed., BSP Professional Books **Supplementary:** Addleson, L., (1992), *Building Failures: A Guide to Diagnosis, Remedy and Prevention*, 3rd ed., Oxford Chudley, R., (1981), *The Maintenance and Adaption of Buildings*, Longman Hull, B., (1988), *Non-destructive Testing*, MacMillan Miles, D., & Syagga, P., (1987), *Building Maintenance – A Management Manual*, Intermediate Technology Publications Ransom, W.H., (1987), *Building Failures – Diagnosis and Avoidance*, 2nd ed., E. & F.N. Spon Royal Institution of Chartered Surveyors, (2000), *Building, Maintenance: Strategy, Planning and Procurement"*, RICS Books. Seeley, I.H., (1987), *Building Maintenance*, 2nd ed., MacMillan

Subject Description Form

Subject Code	BRE329
Subject Title	Construction Contract Law
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	BRE206
Objectives	This subject is intended to: 1. Introduce aspects of law that have particular relevance to development and construction. 2. Provide a practical knowledge of modern development in construction contract law and application of laws and procedures relating to construction contracts and their administration.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: 1. Evaluate the general principles of development control law and apply them in contract administration; 2. Analyse the legal issues in the modern development of law in contract and tort; 3. Apply the legal principles to conduct construction contract administration and to evaluate construction contract claims. 4. Communicate effectively. 5. Possess the ability to engage in life-long learning on Construction Contract Law.
Subject Synopsis/ Indicative Syllabus	1. *Development control*: development process, statutory and non-statutory control. 2. *Construction contracts*: modern development of law in contract and tort; legal interpretation and application in construction contract; bankruptcy and insurance. 3. *Legal basis for Standard form of contract*: characteristics of various standard forms of local and international building contracts and sub-contract. 4. *Duties and responsibilities of the parties to the contract*: implications of contract clauses; legal implication in the procedures for instructions, variations, payments and certification. 5. *Construction claims*: evaluation and presentation of claims; contractual and common law remedies; dispute resolution methods.
Teaching/Learning Methodology	Lectures and tutorials will be run throughout the semester period. The lectures and tutorials will not only disseminate the relevant knowledge but also provide guidance for students to search materials for self-study. Tutorial projects will also be set requiring the student to evaluate and apply the relevant law principles and deduce solution for the cases and also to analyze, critically appraise and resolve administrative, organizational and managerial problems. Key topics will be set for groups of 4-5 students to carry out some research and prepare for presentation and discussion in tutorial class in order to encourage peer group learning and to clarify any difficulties found in lecture and reading. The work

	also will be set on an individual basis and seek to enhance verbal and written communication skills. In order to encourage divergent and innovative thinking, the project work will be set as an interactive project based on changing circumstances. This encourages legal analysis and application and also efficient data management. The work will be based on the issues introduced by the teaching but will reward evidence of further reading and private study. Contact hours include individual or group project supervision. I.T. may be deployed to support teaching.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed					
		1	2	3	4	5	
Coursework	30%	√	√	√	√	√	
Examination	70%	√	√	√	√		
Total	100 %						

Students will be assessed by:
(i) examination, including problem analysis and essay type question, accounting for 70% (one end of semester written paper) and
(ii) through the medium of coursework, including presentation in class of project assignments, accounting for 30% (1 coursework assignment and 1 short written test)

Student Study Effort Expected

Class contact:	
▪ Lectures	21 Hrs.
▪ Tutorials	21 Hrs.
Other student study effort:	
▪ Student effort hours	120 Hrs.
Total student study effort	162 Hrs.

Reading List and References

Indicative Reading List:

Recommended:

Aqua Group, (1996) *Contract Administration for the Building Team, 8th Ed.* Oxford: Blackwell Science.

Chappell, D. (2003), *Understanding JCT Standard Building Contracts*, 7th Ed., E & FN Spon, London

David Chappell. (1998) Powell-Smith & Sims' building contract claims. 3rd Ed. Malden, Mass.: Blackwell Science.

Murdoch, J. & Hughes, W. (2002) *Construction Contracts Law and Management*, 3rd Ed., Spon Press.

	Poon N.T. & Chan E.H. (1998) Real Estate development in Hong Kong, Pace Ltd. H.K. Thomas, R. (2001), *Construction Contract Claims*, 2nd Ed., Macmillan, U.K. Uff, J. (2002) Construction law: law and practice relating to the construction industry, 8th Ed. Sweet & Maxwell, UK. Furst, S. (2001), "Keating on Building Contracts", 7th Ed., Sweet & Maxwell, London. **Supplementary:** Powell-Smith, V. (2000) *Powell-Smith & Furmston's Building Contract Casebook*, Blackwell Science: Oxford. Wallace, Ian Norman Duncan. (1995), "Hudson's Building & Engineering Contracts: including the duties and liabilities of architects, engineers and surveyors", 11th Ed, London : Sweet & Maxwell. Ramus, J.W(1996) *Contract Practice for Quantity Surveyors.* 3rd ed., Oxford : Heinemann Newnes, Hong Kong Government, (1988) *Town Planning in Hong Kong,* H.K. Government Printer Latham, M. (1994), "Constructing the Team", HMSO. Ashworth, A., (2002) Willis's *Practice and Procedure for the Quantity Surveyor, 11th Ed.* Malden, M.A.: Blackwell Science.

Subject Description Form

Subject Code	BRE336
Subject Title	Development Control Law
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	BRE206
Objectives	Build up practical knowledge on property development control law and current measures imposed by government affecting the development and use of property.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: 1. Comprehend the importance of the planning, building law and other aspects of legislation together with other non-statutory requirements on properties for evaluation of impacts on property development and redevelopment. 2. Apply their learnt knowledge on the integrated approach to legal control of new development and existing properties in the course of development and re-development process. 3. Conduct a most appropriate planning on design and construction of property amongst other choices on the basis of latest legislative issues. 4. Analyse and interpret the liabilities of professionals in the course of property development and re-development. 5. Function on multi-disciplinary teams as capacity of discipline leader. 6. Communicate effectively with other players of development or re-development teams.
Subject Synopsis/ Indicative Syllabus	*Planning Ordinance:* Planning law affecting property development; function of the Town Planning Board, the Appeal Board and Land Development Corporation; zoning plans and development control administration; enforcement, appeal and enquiries process. *Buildings Ordinance:* Development and building control through administrative measures, regulations and codes of practice; control and enforcement of illegal and dangerous structures; role of Authorized Person, Registered Structural Engineer and Registered Contractor. *Government Lease and Conditions:* Development conditions; control and enforcement; modification and renewal. *Professional Liabilities:* Professional licensing and liabilities; modern development in the law of contract and tort, post-construction liabilities and insurance. *Other Related Laws:* Environmental control laws; law relating to dilapidation and occupation of building; and Practice Notes for building professionals and registered contractors.
Teaching/Learning Methodology	The basic concept of law and critical procedures related to development control will be explained in lectures. Tutorial and seminars will be arranged for discussion in specific topic set for the students in order to facilitate two-way communication and to understand the students' difficulties and needs. Case study projects will be assigned to small group of 4-5 students to encourage students to take initiation to research and explore options, to tackle problem and to benefit from peer group learning. The

<table>
<tr><td></td><td>project shall emphasis on the application of knowledge and to understand the integration of the subject material with other subjects in a development project. Experience practitioners will be invited to deliver lectures and seminars for updated input on the current practice.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>The coursework in the form of continuous assessment will account for 50% and the written examination will account for 50%. The marking will emphasis assessing on both the process and submitted product. Students are encouraged to explore options of property development within the constraint of development law through project work and tutorial assignments. Questions will be asked during presentation to ensure the students have achieved the learning outcomes.
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="8"></td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>h</td></tr>
<tr><td>1.Project</td><td>35</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>2. Seminar topic discussion</td><td>15</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td><td></td><td></td><td>√</td></tr>
<tr><td>3. Examination</td><td>50</td><td></td><td>√</td><td></td><td>√</td><td></td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="8"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:
(a) Participation and contribution.
(b) Relevant focus and depth.
(c) Assumptions and information collection.
(d) Analysis, synthesis and technical competence under different scenarios.
(e) Clarity and relevance of written report.
(f) Logic of explanation.
(g) Relevance and clarity of sketches.
(h) Communication skills.</td></tr>
<tr><td>Student Study Effort Expected</td><td colspan="2">
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lecture</td><td>21 Hrs.</td></tr>
<tr><td>▪ Tutorial</td><td>21 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Project work</td><td>80 Hrs.</td></tr>
<tr><td>▪ Seminar topic discussion</td><td>40 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>162 Hrs.</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>Bacon, N. (1996). Conveyancing 2nd Edition, Hong Kong: FT Law & Tax Asia Pacific.

Buildings and Lands Department (1991), Building Control in Hong Kong, HK Government Printer.</td></tr>
</table>

	H.K. Government (1991). *Consultative Document on Comprehensive Review of Town Planning Ordinance*, HK Government Printer. H.K. Government (latest edition). *Buildings Ordinance and Regulations,* HK Government Printer. H.K. Government (latest edition). *Planning Ordinance and Regulations,* HK Government Printer. Practice Notes for Authorized Persons, Registered Structural Engineers and Registered Contractors, latest edition, Buildings Department. Ding, Li-Yun (1995), Development process of Real Estate in the PRC, *Symposium of Real Estate,* PRC Peoples' University Publishing House, pp.204-210. (CHINESE TEXT). H.K. Government *Town Planning in Hong Kong,* HK Government Printer. Built Environment at the crossroads (1996). *The 1996 Fourth World Congress of Building Officials, Hong Kong*, WOBO, HK**.**

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	21 Hrs.
▪ Tutorial	21 Hrs.
Other student study effort:	
▪ Self studying. Preparation for tutorial classes, course work and examination.	120 Hrs.
▪	Hrs.
Total student study effort	120 Hrs.

Reading List and References	Recommeded (the latest editions of the following books should be used): Cruden, G. Land Compensation and Valuation in Hong Kong. Kent, P., Merry M. & Walters M Building Management in Hong Kong, Lexis Butterworths. Nield, S. Hong Kong Land Law, Longman Asia/ FT Law & Tax. Merry, M. Hong Kong Tenancy Law, Butterworths. Murphy, W.T. & Robert, S.(1998). Understanding Property Law, 3rd edition, Sweet & Maxwell.. Sihombing, J. & Wilkinson, M. A Student's Guide to Hong Kong Conveyancing, 4th Edition, Butterworths. Supplementary: Authorized Hong Kong Law Report and Digest, Sweet & Maxwell. Government Publications. Halsbury Laws of Hong Kong, Butterworths. Hong Kong Cases, Butterworths.

Subject Description Form

Subject Code	BRE341
Subject Title	Property Management I
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	*This subject is intended to:* 1. Introduce to the students the principles and practice of property management. 2. Focus on the application of the principles to the property management services. 3. Give the students a basic knowledge for managing buildings in the private and public sectors. 4. Help them to develop management skills in practice.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Review the fundamentals of property management. b. Identify the business and work environment in property management services in Hong Kong. c. Apply the principles and practice necessary for efficient planning and administration of property management. d. Synthesize their knowledge to solve problems in property management.
Subject Synopsis/ Indicative Syllabus	*Managing Marketing of Property Management Services* An introduction to the nature of property management and the market for property management services. An analysis of existing services; types of buildings and estates; internal organization of property management business; marketing of property management services. *Managing Common Areas of Owner's Property* Pre-management planning before take-over of premises: Organizational principles and establishment of a new management office; testing of building services; identifying defects of premises. Provision of services after take-over of premises: Staff management; financial management; security services; fire services installations; water and electricity supply; cleansing services; air-conditioning and so on. Environmental and conservation issues in property management: energy saving; control of illegal structures and estate modernization. *Managing Leased Property* Leasing and tenancy arrangements: Contractual and statutory lease conditions; tenancy renewals; tenant mix rent reviews; Landlord and Tenant (Consolidation) Ordinance.

Managing Owner and Tenant Relations

Formation of Owners' Incorporation: Deed of Mutual Covenant; Building Management Ordinance; consultation channels with landlords and tenants.

Managing Risk and Liability

Statutory and professional liability in property management: Insurance; negligence; nuisance; employer's liability and contractor's liability.

Teaching/Learning Methodology

The principles of property management will be introduced in lectures. Application of the principles to solve property management problems will be taught in case studies, role play and management games. Discussion will be facilitated in tutorial by small group studies, which provide opportunities for students to deliver their discussion results and thinking. Lectures, seminars, laboratory as well as tutorials will form a basic skeleton for learning the subject.

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 I	15%	√	√	√	√		
2. Coursework II	15%	√	√	√	√		
3. Examination	70%	√	√	√	√		
Total	100 %						

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

The coursework mark will be based on the assignments and presentation.

Two pieces of equally weighted coursework will be set out to assess the understanding of the students on this subject during the period of teaching and learning.

Student Study Effort Expected

Class contact:	
▪ Lecture	21 Hrs.
▪ Seminar/Tutorial	21 Hrs.
Other student study effort:	
▪ Self-study	120 Hrs.
Total student study effort	162 Hrs.

Reading List and References	**Recommended:** Kyle, R. C. (1995) *Property Management. Chicago*: Real Estate Education Co. Loo, F.K. (1992) *A Guide to Effective Management in Hong Kong*. The Hong Kong University Press. **Supplementary:** Bachner, P.J. (1991) *The Guide to Practical Property Management*. Mc Graw-Hill, Inc. Cushman, RF. & Rodin, N.I. (1985) *Property Management Handbook: A Practical Guide to Real Estate Management*. U.S.A.: John Wiley & Sons Inc. Edmington, G. (1997) *Property Management: A Customer Focussed Approach*. England: Macmillan. Downs, A. (1991*) Principles of Real Estate Management*, Institute of Real Estate Management. Scarett, D. (1983) *Property Management.* London: E. & F.N. Spon Ltd.

Subject Description Form

Subject Code	BRE345
Subject Title	Measurement, Documentation & Estimating
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	BRE291
Objectives	The objectives of this subject are to equip students with the skills and knowledge to measure buildings and property accurately and efficiently and produce appropriate documentation to obtain a competitive price.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: 1. Prepare, examine and compare documentation to be used in procurement of building works and property. 2. Quantify and describe new building works and alteration work. 3. Analyse and synthesis composition of unit rates and an appreciation of the cost.
Subject Synopsis/ Indicative Syllabus	*Measurement of new building work, alteration work and property (for learning outcome 1) :* Organisation and systems of measurement including subdivision of building elements, gross measurement, schedules and other preparatory documentation such as query lists. Mensuration commonly used in measurement including mean girth, formulae for regular figures and methods of measuring irregular figures, interpolation and extrapolation of ground levels, gross and net floor areas. Measurement techniques : measurement of buildings, comparative studies of measurement procedures and examination of forward trends. *Documentation of new building work, alteration work and property (for learning outcome 2) :* Communication between buyer, designer, construction and estimator; types of documentation and their uses; preparation and uses of bills of quantities and specifications; preambles and preliminaries. *Estimating (for learning outcome 3):* Factors influencing the pricing of new works and property. Evaluation of resources: labour, plant and materials. Enquiries for materials and sub-contract prices; calculation of unit rates; calculation of preliminaries and temporary works. Estimator's cost report to management.

<table>
<tr><td>Teaching/Learning Methodology</td><td>The theory and rationale will be delivered in lecture periods. Practical experiences will be relocation in the tutorial periods.</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>e</td><td></td></tr>
<tr><td>1. Coursework I: Individual assignment (taking off exercise, preparing taking off documents)</td><td>20%</td><td>√</td><td>√</td><td></td><td></td><td></td><td></td></tr>
<tr><td>2. Coursework II: Group project (estimating problem)</td><td>20%</td><td>√</td><td>√</td><td>√</td><td></td><td></td><td></td></tr>
<tr><td>3. 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:

Students are given an individual assignment (taking off exercise) from reading construction drawings to taking dimensions off from the drawings. Upon completion of the assignment 1, students will be able to achieve learning outcome 1 &2.

Students are given a group project to solve some estimating problems. Through the problem solving exercises relating to estimating activities, students will be able to achieve learning outcome 3.
</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lecture</td><td>21 Hrs.</td></tr>
<tr><td>▪ Seminar / Tutorial</td><td>21 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ student study effort</td><td>120 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>

Aqua Group (1990) Tenders and Contracts for Building, BSP Professional Books, Oxford

Aqua Group (1992) Precontract Practice for the Building Team, BSP Professional Books, Oxford

Holroyd T.M. (2000) Principles of Estimating, Thomas Telford, London

Picken D.H. & Drew D.S. (1996) Building Measurement in Hong Kong: Worked Examples Longman Asia Ltd., Hong Kong

Royal Institution of Chartered Surveyors (1979) Hong Kong Standard Method of Measurement for Building Works 3rd Edition, Royal Institution of Chartered Surveyors (Hong Kong Branch)

Turner D. (1983) Quantity Surveying Practice and Administration, Godwin, London

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

Subject Description Form

Subject Code	BRE346
Subject Title	Integrated Project IIA
Credit Value	4
Level	3
Pre-requisite / Co-requisite/ Exclusion	Pre-requisite: BRE218 or equivalent Co-requisite: Nil Exclusion: Nil
Objectives	*This subject is intended to:* a) Encourage the critical investigation, analysis and synthesis in solving problems in the professional context. b) Provide an environment for the student to develop skills in identifying and solving problems and allows the integration of knowledge gained in separate subject areas. c) Promote the students' understanding of the interdisciplinary and course specific nature of the development and construction process and develops team working. d) Develop an outlook for construction and surveying practices in other countries.
Intended Learning Outcomes	*Students will demonstrate their ability to:-* a) Identify and diagnose problems in the development and construction process, including social, technical, economical and environmental issues. b) Integrate and create knowledge and skills acquired in various subject areas and to solve problems in a professional manner. c) Keep abreast current and future development of the professional surveying industry in Hong Kong, Asia Pacific Region and worldwide and make appropriate use of such knowledge in proposed analysis and actions. d) Communicate and work effectively with members from same or different professions, including effective oral/written presentation of analysis, justification of recommended actions, and persuasive messages intended to affect the perceptions of others. e) Appreciate the differences in construction or surveying practices between Hong Kong and other countries through an in-depth study.
Subject Synopsis/ Indicative Syllabus	A series of construction and property related project scenarios 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 projects will require students to make use of and integrate knowledge from previous and current subject modules. Each project will include elements of group and individual work. The projects require students to develop solutions creatively and to present recommendations systematically. Comparative study between construction and surveying practices in Hong Kong and other countries.

<table>
<tr><td>Teaching/Learning Methodology</td><td>The projects will provide a student centered problem-based learning approach in a professional or industrial setting. The projects will be delivered by a team of project tutors, with overall co-ordination by one member of staff to ensure continuity and relevance of project subject matter. Project material will be co-ordinated at the start of each academic year to ensure quality and consistency of the project information given to the students. This subject will be timetabled one day per week throughout 3 semesters of year 2.

An important part of the subject is the comparative study of the construction and real estate industry of selected countries and Hong Kong. A Study Tour or equivalent is to be organized by students.</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>e</td><td></td></tr>
<tr><td>1. Coursework</td><td>100%</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></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>
The subject will be assessed by projects, presentations and reflective journals. Each project will contain tasks such that marks can be awarded for group work as well as for individual work.
</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Project work</td><td>140 Hrs.</td></tr>
<tr><td>▪</td><td></td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Student study effort</td><td>154 Hrs.</td></tr>
<tr><td>▪</td><td></td></tr>
<tr><td>Total student study effort</td><td>294 Hrs.</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>Construction and Management-related Journals, Library Databases, Statistics, Module Texts and Internet Resources</td></tr>
</table>

Subject Description Form

Subject Code	BRE347
Subject Title	Urban and Construction Economics
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Pre-requisite: BRE216 Co-requisite/Exclusion: Nil
Objectives	1. Enable students to understand economic theories and analytical techniques related to real property and urban land issues. 2. Enable students to understand the factors affecting construction cost
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Use relevant economics principles to develop the ability to analyse the real estate market and urban economy. b. Utilise skills to synthesise coherent arguments and policy implications to support decision-making process in urban development policies. c. Analyse the factors affecting construction cost at an industry and project level. d. Compile cost plan for a given project using cost records. e. Communicate principles, theories and cost data effectively. f. Identify contemporary issues related to urban and construction economics
Subject Synopsis/ Indicative Syllabus	<u>Economic Theories & Concepts underlying Urban Land Issues</u> Nature of land economics, land policies and land administration. Theories of urban growth and urban structure, and economics of urbanization. Theories of land rent and urban land use pattern. Analysis of real estate market. Techniques of economic analysis of urban land development and redevelopment. Economics of property rights and public sector intervention. <u>Construction Economics</u> Role of construction in the economy. Demand and supply for construction . Productivity. Types of client and the client's brief. Complilation and use of cost data. Cost indices. Price determination of construction project. Design economics. Cost planning. Introduction to cost modelling.
Teaching/Learning Methodology	The main theory and concepts are delivered through lectures (each at 1.5 hrs per week), with application and discussion being covered in seminars and tutorials (each at 1.5 hrs per week in small groups), for a total period of 14 weeks. The syllabus covers 2 main sections: (I) Economic theories and concepts underlying urban land issues; and (II) Construction economics. Section I provides an outline to students on the broad picture of urban land economics, with particular emphasis on economic of urbanisation, land use policies, land administration and public sector intervention in land and real estate markets. The fundamentals of knowledge on land use will lay a good foundation for future

professionals dealing with land and buildings.

Section II on construction economics will take students through the macro and micro factors determining construction cost.

Apart from face-to-face lectures and discussion, students can download teaching materials, including some articles for reference, from an electronic teaching platform called "SMILE".

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	f
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	Oral Seminar Presentation	Written Seminar Report	Examination
1. to possess skills to identify, analyze and		√	√
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			√
a. Use relevant economics principles to develop the ability to analyse the real estate market and urban economy.	√	√	√
b. Utilise skills to synthesise coherent arguments and policy implications to support decision-making process in urban development policies.	√	√	√

	c. Analyse the factors affecting construction cost at an industry and project level.			√
	d. Compile cost plan for a given project using cost records.	√	√	

The assessment criteria adopted in tutorial/seminars
("plus" grade for enhanced performance possible for each grade except F)

1. Seminar (oral presentation) – individual assessment (20%)
   - Oral presentation skills: A for excellent, B for good, C for clear, D for reading from script, F for mumbling
   - Familiarity with the topic: A for excellent, B for good, C for adequate, D for poor, F for no knowledge
   - Quality of visuals: A for excellent, B for good, C for adequate, D for barely sufficient, F for poor
   - Answer during discussion: A for excellent, B for good, C for adequate, D for barely sufficient, F for poor

2. Seminar (Group report) – overall (group) assessment (20%)
   - Written communication skills: A for excellent, B for good, C for clear, D for barely sufficient, F for poor
   - Data/information collection: A for excellent, B for good, C for adequate, D for barely sufficient, F for poor
   - Data interpretation & analysis: A for excellent, B for good, C for adequate, D for barely sufficient, F for poor
   - Identification of problem/issue: A for excellent, B for good, C for adequate, D for barely sufficient, F for poor
   - Conclusion: A for excellent, B for convincing, C for adequate, D for barely sufficient, F for poor

Student Study Effort Expected		
	Class contact:	
	▪ Lectures	21 Hrs.
	▪ Seminars/Tutorials	21 Hrs.
	Other student study effort:	
	▪ Independent study	120 Hrs.
	Total student study effort	162 Hrs.

Reading List and References

Balchin, P.N. & Kieve, J.L., (1988) *Urban Land Economics*, London: MacMillan
Barr, N., (1993) *The Economics of the Welfare State*, London: Weidenfeld and Nicolson

Briscoe, G., (1988) *The Economics of the Construction Industry,* London: Mitchell
Cheshire, P.C. Evans, A.W. (eds), (1991) *Urban and Regional Economics*, London: Edward Elgar

Darlow, C., (1988) *Valuation and Development Appraisal,* London: Estate Gazette Ltd.

Ferry, D. & Brandon, P.S., (1991) *Cost planning of Buildings,* 6th Edition, London: BSP Professional Books

Harvey, J. (1992) *Urban Land Economics: The Economics of Real Property*, London: MacMillan

Hui, C.M., Chan, P.C., Wong, K.W., Wong K.C. & Leung, Y.P. (2000), *The Supply of Land for Housing in Hong Kong*, Research Monograph, The Hong Kong Polytechnic University

Mills, E.S. & Hamilton, B.W. (1992), *Urban Economics*, N.Y.: Harper Collins

Myers D. (1994), *Economics and Property*, London: Estate Gazette

O'ullivan, A., (1993) *Urban Economics*, London: Irwin

Raftery, J., (1991) *Principles of Building Economics*, London: BSP Professional Books

Ashworth A., (2010*) Cost Studies of Buildings*, Harlow, England: Pearson

Supplementary:

Broadway, R., (1984) *Public Sector Economics*, Oxford: Basil Blackwell

DiPasquale, D. & Wheaton, W.C. (1996) *Urban Economics and Real Estate Markets*, London: Prentice Hall

McMahon, J., (1989) *Property Development*, London: McGraw-Hill

Newell, M., (1977) *An Introduction to Economics of Urban Landuse*, London: Estate Gazette

Tolley, G.S. & Thomas V. (ed), (1987) *The Economics of Urbanisation and Urban Policies in Developing Countries*, Washington: The World Bank

Tse R., (1992) *Hong Kong Housing Market*, H.K.: Commercial Press

Zerbe, R.O. & Divley, D.D. (1994) *Benefit-cost Analysis: In Theory and Practice*, NY: Harper Collins

Smith, J. (1998) *Building Cost Planning for the Design Team*, Deakin University Press

Seeley, I. (1996) *Building Economics*, MacMillan

Pilcher, R. (1994) *Project Cost Control in Construction*, Blackwell Scientific Publication

Hong Kong Statistics (current issues), Hong Kong SAR Government

Subject Description Form

Subject Code	BRE348
Subject Title	Integrated Project II
Credit Value	6
Level	3
Pre-requisite / Co-requisite/ Exclusion	BRE218 or its equivalent
Objectives	1. To develop critical investigation skills in solving problems in a professional context 2. To provide an environment for the student to develop communication skills in identifying and solving problems 3. To integrate the knowledge gained in separate subject areas
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Understand the basic operation of property management strategies in an institutional context. b. Develop teamwork spirit as an effective approach to tackle a project and problem-solving techniques. c. Apply property management techniques to ensure the efficient use and maintenance of buildings. d. Evaluate the property management related contemporary issues.
Subject Synopsis/ Indicative Syllabus	Practice-based or problem-based property management project(s) will be set to replicate a situation which could be met in practice. The projects will require the students to relate local housing policy or management issues and integrate knowledge from pervious and current subject modules. Each project will include elements of multidisciplinary and individual works. A study tour will also be included. Sometimes the restrictions of the study environment will require the above learning arrangements to be modified.
Teaching/Learning Methodology	The projects will provide a student centred problem-based learning approach in a professional or industrial setting. An important part of the subject is a study tour or equivalent to be organized by the students to study property management industry of selected regions.

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. Coursework	100%	✓	✓	✓	✓		
Total	100 %						

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

Students will be assessed through both coursework to assess learning outcome a to d.

Student Study Effort Expected

Class contact:	
▪ Lectures	
▪ Tutorials	
Other student study effort:	
▪ Self-studies	240 Hrs.
▪	Hrs.
Total student study effort	240 Hrs.

Reading List and References

Reading List:

Recommended:

Real Estate and Property Management Journals, Databases, Statistics and Module Texts

Subject Description Form

Subject Code	BRE349
Subject Title	Building Services I
Credit Value	3
Level	Level 3
Pre-requisite / Co-requisite/ Exclusion	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: 1. Possess a knowledge of the system configuration and operation of various building services systems. 2. Relate how different building services systems can help to control and improve the indoor environment. 3. Identify the relationships between the design of building services systems and the overall building design. 4. Appreciate the cost and value relationship on the selection of appropriate building services systems. 5. 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. Electricity: Assessment of electricity demand. Lightning protection. Earthing provisions. HVAC/MVAC: Assessment on the efficiency of air-conditioning process. Large scale air conditioning systems configuration and operation. Internal transportation: The configuration and operation of lifts and escalators. Assessment to the quality of services for life operation. Fire Services: Prevention, detection and suppression systems. Integration of fire services system to other building services systems. An introduction to the measurement for building services installations.

Teaching/Learning Methodology

The learning and teaching approaches for the subject comprises lectures, tutorials and laboratories.

Lectures aims at delivering the basic core of concepts whilst ideas and operations will be further elaborated and discussed in the tutorials. Presentation by students during tutorials on selected topics will also be arranged. Laboratories are provided to allow students to relate theories and concepts to real situation.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		1	2	3	4	5	
1. Oral Presentation	16 %	✓	✓			✓	
2. Case Study Report	24 %	✓	✓	✓	✓	✓	
3. Examination	60 %	✓	✓	✓		✓	
Total	100 %						

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

Assessment will be in the form of written examination, oral presentation, case study report and laboratories.

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 serves to assess students' understanding to the topics chosen.

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.

The split between coursework and examinations will be 40/60.

Student Study Effort Expected

Class contact:	
▪ Lecture	21 Hrs.
▪ Tutorial	21 Hrs.
Other student study effort:	
▪ Laboratory	8 Hrs.
▪ Self-Learning	70 Hrs.
Total student study effort	120 Hrs.

Reading List and References	**Recommended:** Burberry P. (1997) *Environment & Services*, 8th Edition, Longman Scientific & Technical Chadderton D.V. (2007) *Building Services Engineering*, 7rd, Taylor & Francis Chadderton D.V. (1997) *Air Conditioning: a practical approach*, E & F.N. Spon Hall F. & Greeno R. (2009) *Building ServicesHandbook*, 5th ed., Longman Wise A.F.E. (1995) *Water, Sanitary and Waste Services for Buildings* Greeno R. (1997) *Building Services, Technology and Design*, Longman Wang S. K. (2001) Air Conditioning and Refrigeration, 2nd ed., McGraw Hill **Supplementary:** HKSAR (1996) *Code of Practice for the Provision of Means of Escape Case of Fire* HKSAR (1994) *Code of Practice for Minimum Fire Services Installations and Equipment* HKSAR (2004) *Code of Practice for the Provision of Means of Access for Fire-fighting and Rescue* HKSAR (2005) *Code of Practice for Minimum fire Services Installations and Equipment and Inspection, Testing and Maintenance of Installations and Equipment* H.K. SAR Government, *Building Ordinance and Regulations* CAP.123 NFPA (1997) *Fire Protection Handbook*, 18th Edition Stoecker W.F. & Jones J.W. (1982) *Refrigeration and Air Conditioning*, McGraw Hill 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	BRE350
Subject Title	Project Management and Procurement
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Pre-requisite: BRE2921 Co-requisite/Exclusion: Nil
Objective	1. Extend students' understanding of management principles and develop the knowledge of project management and procurement in the construction industry.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: 1. Apply knowledge of time, quality, safety and environmental management for construction projects. 2. Negotiate and resolve conflicts between management and employees. 3. Communicate with others in a clear and articulate manner. 4. Identify and propose solutions to problems. 5. Identify the different forms of procurement and assess their impacts on the success of a project. 6. Describe the principles underlying the choice of appropriate procurement systems. 7. Apply and compare alternative procurement systems for all types of construction work.
Subject Synopsis/ Indicative Syllabus	***Quality, Safety and Environmental Management*** Quality assurance system, safety management system and environmental management. ***Human Resources Management*** Recruitment, selection and engagement of personnel in construction organizations, and industrial relations. ***Planning and Programming Techniques*** Planning and programming techniques including bar chart, critical path analysis and line of balance. ***Construction Procurement*** ● The nature of building process, models of the process. ● Categorization of procurement systems. ● Alternative procurement systems such as traditional sequential, traditional accelerated, competitive design and build, enhanced design and build, novated design and build, management contracting and construction management, guaranteed maximum price and target cost contracting, and public private partnership. ● Choice of appropriate procurement methods, allocation of risks and liabilities of the major parties to the arrangement.

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

- Relational contracting and its impact on procurement.
- Subcontracting management in construction.

</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Lectures will be used to introduce systems and techniques whilst the small group work will be used for the application of management skills through role-play and seminar presentation.</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="7">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>6</td><td>7</td></tr>
<tr><td>1. Role Play</td><td>25%</td><td></td><td>√</td><td>√</td><td>√</td><td></td><td></td><td></td></tr>
<tr><td>2. Seminar/Group Report</td><td>25%</td><td></td><td></td><td></td><td></td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>3. Examination</td><td>50%</td><td>√</td><td></td><td></td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="7"></td></tr>
</table>

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

<table>
<tr><td>Learning outcomes</td><td>Role Play</td><td>Seminar Presentation / Written Report</td><td>Examination</td></tr>
<tr><td>1. to possess skills to identify, analyze and solve</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>2. to have an understanding of professional, social and ethical responsibilities</td><td>√</td><td></td><td>√</td></tr>
<tr><td>3. to communicate effectively</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>4. to contribute as team member and to lead effectively</td><td>√</td><td>√</td><td></td></tr>
<tr><td>5. to identify contemporary issues</td><td></td><td></td><td>√</td></tr>
</table>

<u>The assessment criteria adopted in tutorial/seminars</u>
("plus" grade for enhanced performance possible for each grade except F)

1. Role Play – individual assessment (25%)
   - Oral presentation skills: A for excellent, B for good, C for clear, D for reading from script, F for mumbling
   - Familiarity with the topic: A for excellent, B for good, C for adequate, D for poor, F for no knowledge
   - Answer during discussion: A for excellent, B for good, C for adequate, D for barely sufficient, F for poor

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

	2. Seminar (Group report) – overall (group) assessment (25%) • Written communication skills: A for excellent, B for good, C for clear, D for barely sufficient, F for poor • Data/information collection: A for excellent, B for good, C for adequate, D for barely sufficient, F for poor • Data interpretation & analysis: A for excellent, B for good, C for adequate, D for barely sufficient, F for poor • Identification of problem/issue: A for excellent, B for good, C for adequate, D for barely sufficient, F for poor • Conclusion: A for excellent, B for convincing, C for adequate, D for barely sufficient, F for poor	
Student Study Effort Expected	Class contact:	
	▪ Lectures	21 Hrs.
	▪ Seminars/Tutorials	21 Hrs.
	Other student study effort:	
	▪ Independent study	120 Hrs.
	Total student study effort	162 Hrs.
Reading List and References	**Recommended Reading List:** **<u>Project Management</u>** Chan, P.C., Wong, K.W., Chan, W.M., , Cheung, E., Choy, E., Chung, S.K., Kwok, W.K., Lam, W.M., Lee, W.C., Liu, C.H., Lo, C.H., Siu, K.W., Wong, C.W., & Yam, C.H., (2009) Developing a Prototype for the Rapid Demountable Platform (RDP) – Stage II of CII-HK Research on "Construction Safety Involving Working at Height for Residential Building Repair and Maintenance", Research Summary Report, Construction Industry Institute – Hong Kong, ISBN No. 1978-988-99558-7-8, April, 43pp. Chan, A.P.C., Wong, F.K.W., Chan, D.W.M., Chan, E.H.W., Cheung, E., Kwok, A.W.K., Lam, E.W.M., Yam, M.C.H. and Yiu, E.C.Y. (2007). *Construction Safety Involving Working at Height for Residential Building Repair and Maintenance*, Summary Report, Construction Industry Institute – Hong Kong, Research Report No. 9, 52 pages, ISBN 978-988-99558-1-6, November 2007. Chan A.P.C., Wong F.K.W., Yam M.C.H., Chan D.W.M., Ng J.W.S. and Tam C.M. (2005). *From Attitude to Culture - Effect of Safety Climate on Construction Safety*, Research Monograph, Department of Building and Real Estate, The Hong Kong Polytechnic University, ISBN 962-367-432-5, 160 pages. Chan P.C., Wong K.W., Lam T.I. and Choi C.W. (2004) *Quality Relationships in Public Housing of Hong Kong*, Research Monograph, Department of Building and Real Estate, The Hong Kong Polytechnic University, ISBN 962-367-426-0, 77 pages. Harris F. and McCaffer R. (2001) *Modern Construction Managemen*t, 5th Edition, Blackwell Science: Oxford Lam T.I., Wong K.W., Chan P.C., Shea C.Y. and Poon C.K. (2004) *Development of a Quality Assessment Mechanism for Private Residential Building Projects in Hong Kong*,	

Research Monograph, Department of Building and Real Estate, The Hong Kong Polytechnic University, ISBN 962-367-421-X, 69 pages.

Lavender S. (1996) *Management for the Construction Industry*, Longman: UK

Poon, S.W., Tang, S.L., & Wong, K.W. (2008) Management and Economics of Construction Safety in Hong Kong, Hong Kong University Press, June, ISBN No. 978-962-209-906-7, 169pp

Tang S.L., Ahmed S.M., Aoieong R.T. and Poon S.W. (2005) *Construction Quality Management*, Hong Kong University Press: Hong Kong

Tang S.L., Poon C.S., Ahmed S.M. and Wong F.K.W. (2003) *Modern Construction Project Management*, 2nd Edition, Hong Kong University Press: Hong Kong

Walker Anthony (2002) *Project Management in Construction*, 4th Edition, Blackwell Sciences: Oxford

Yam, C.H., Wong, K.W., Chan, P.C., Cheung A.C., Chan, W.M., Chan, W.T., & Chan, H.L. (2007) Safety Considerations for Residential Repair and Maintenance Works on Facades in the Design Phase in Hong Kong, Research Monograph, The Hong Kong Polytechnic University, August, ISBN No. 978-962-367-515-4, 148pp.

Construction Procurement

Chan, APC, Chan, DWM, and Yeung, JFY (2010) *Relational Contracting for Construction Excellence – Principles, Practices and Case Studies*. Spon Research, Taylor & Francis, 1st Edition, ISBN13: 978-0-415-46669-1, HD9715.A2C47 2009, 624.068'4-dc22, 334 pages.

Chan A.P.C. and Chan D.W.M., Editors (2004). *Proceedings of the CII-HK Conference 2004 on Construction Partnering: Our Partnering Journey - Where Are We Now, and Where Are We Heading?,* Construction Industry Institute – Hong Kong, 9 December 2004, Hong Kong, China, ISBN 988-98153-2-X, 206 pages.

Chan A.P.C., Chan D.W.M., Fan L.C.N., Lam P.T.I. and Yeung, J.F.Y. (2004). *A Comparative Study of Project Partnering Practices in Hong Kong*, Summary Report, Construction Industry Institute – Hong Kong, Research Report No. 1, ISBN 988-98153-1-1, 40 pages.

Chan A.P.C., Chan D.W.M., Ho K.S.K., Chiang Y.H., Chan E.H.W. and Tang B.S. (2002) *An Analysis of Project Partnering in Hong Kong*, Research Monograph, Department of Building and Real Estate, The Hong Kong Polytechnic University, ISBN 962-367-363-9, 96 pages.

Chan A.P.C., Ho D.C.K., and Tam C.M. (2003) *Evaluation of Integrated Procurement Systems in Hong Kong*, Research Monograph, Department of Building and Real Estate, The Hong Kong Polytechnic University, ISBN 962-367-286-1, 75 pages.

Chan A.P.C. and Yu A.T.W. (2003) *Construction Process Improvement – A Case Study of the North District Hospital*, Research Monograph, Department of Building and Real Estate, The Hong Kong Polytechnic University, ISBN 962-367-287-X, 63 pages.

Chan A.P.C and Yung E.H.K. (2003) *Procurement Selection Model for Hong Kong*, Research Monograph, Department of Building and Real Estate, The Hong Kong Polytechnic University, ISBN 962-367-285-3, 143 pages.

	Masterman J.W.E. (2002) *An Introduction to Building Procurement Systems*, 2nd Edition, E&FN Spon, London. Turner A. (1997) *Building Procurement*, UK MacMillan

Subject Description Form

Subject Code	BRE351
Subject Title	Contract Administration
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	This subject is intended to Introduce students to the legal aspects of construction contracts and provide them with the ability to critically apply the practices and procedures involved.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: 1. Apply the general principles of contract law to construction contracts. 2. Interpret the contractual procedure, rights and duties stipulated in a construction contract. 3. Provide solutions to routine and unfamiliar contractual problems. 4. Gather and analyse information relating to contemporary contractual issues. 5. Communicate effectively with legitimate reasoning. 6. Reflect on and review their studies in the contract of the construction industry.
Subject Synopsis/ Indicative Syllabus	• Contractual and common law principles and practice. • Characteristics of various standard forms of local and international construction contracts. • Role and relationship of the parties under different contractual arrangements. • Procedure for instructions, variations, payments, claims and certification. • Responsibility of the contract administrator.
Teaching/Learning Methodology	Lectures, tutorials and seminars 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.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed					
		1	2	3	4	5	6
Coursework	30%	√	√	√	√	√	√
Examination	70%	√	√	√	√	√	
Total	100 %						

Students will be assessed by:
(i) examination, including problem analysis and essay type question, accounting for 70% (one end of semester written paper) and
(ii) through the medium of coursework, including presentation in class of project assignments, accounting for 30% (1 coursework assignment and 1 short written test)

Student Study Effort Expected

Class contact:	
▪ Lectures	21 Hrs.
▪ Tutorials	21 Hrs.
Other student study effort:	
▪ Student effort hours	120 Hrs.
Total student study effort	162 Hrs.

Reading List and References

Indicative Reading List:

Hills, M.J. (2001) *Building Contract Procedures in Hong Kong*. Longman Hong Kong Education.

Murdoch & Hughes (1996) *Construction Contracts: Law & Management.* E & EN Spon, U.K.

Shum, C. (1998) *General Principles of Hong Kong Law*, 3rd ed., Longman, Hong Kong.

Subject Description Form

Subject Code	BRE377
Subject Title	Research Methods
Credit Value	2
Level	3
Pre-requisite / Co-requisite/ Exclusion	Pre-requisite: Level 2 core subjects Co-requisite / Exclusion: Nil
Objectives	To prepare students for undertaking a manageable piece of research leading to a dissertation.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Describe and appraise the key concepts, elements and requirements in research. b. Describe the meaning of plagiarism and demonstrate the proper ways to avoid it. c. Apply the knowledge of fundamental statistics in collecting, organizing, summarizing, presenting and analyzing data, as well as drawing valid conclusions. d. Conduct hypothesis testing and valid multiple regression analysis with its diagnostic tests. e. Produce a dissertation research proposal with researchable topic related to the fields of construction and real estate.
Subject Synopsis/ Indicative Syllabus	A. Concepts: Philosophy of sciences, theory, hypothesis, methodology, method, research objective, problem statement, classification of research, etc. B. Process: Literature search and review, referencing and plagiarism, work plan, authorship skills, data assembly, time management, writing up, etc. C. Qualitative research: Strategy, approaches, methods, analysis, examples, limitations, etc. D. Quantitative research methods: Descriptive and inferential statistics, normal distribution, basic quantitative techniques, hypothesis testing and decision making, correlation and regression analysis, and application of computer softwares/programs to handle statistical problems and calculations, etc. *(Remarks: Students are expected to learn these statistical techniques in more details and many other relevant quantitative techniques by their own initiatives.)* E. Writing out a dissertation proposal.
Teaching/Learning Methodology	In the lectures, teachers will introduce the course materials, explain the key theories and concepts and showcase examples of the methodology, elements and possible loopholes in doing a piece of research. The essential concepts and principles of various key subject areas under the qualitative and quantitative research methods will be presented in the lectures, leading to the preparation of initial dissertation proposals for submission. Tutorials will be used for discussion, problem-solving, hands-on demonstration and library visits. Interactive multi-media self-accessed learning materials will be provided via the department's computer network (e.g. WebCT / SMILE subject websites). Coursework will be designed to assess the students' ability

<table>
<tr><td></td><td>to demonstrate their understanding of the course materials and their abilities to achieve the learning outcomes.</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>e</td><td></td></tr>
<tr><td>1. Continuous assessment</td><td>100%</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>
The subject “Research Methods” is a major component leading to the learning and completion of Dissertation. Students must complete and pass all the components of the subject. Half of the total coursework mark will be devoted to qualitative research methods, and the other half quantitative research methods. Qualitative and quantitative research methods are complementary and supplementary to each other. They are not complete in themselves. Students need to demonstrate their learning outcomes, at pass levels, on both of them to complete the course. Marks will be allocated on an individual basis.
The subject will be assessed on a continuous basis and no examination is required. The approach to coursework assessment is guided by two principles. First, the need to assess the extent to which the students have achieved the learning outcomes with respect to grading criteria. Second, the assessment itself should contribute in some way towards reflection and learning of the importance of research methods in Dissertation. The total coursework mark will be based on a portfolio comprising a series of problem-based assignments, on-line quizzes and in-class written tests, seminar and discussion. These assessment tools attempt to test the level of students’ knowledge and application of fundamental qualitative research concepts and statistical techniques, in manipulating data for presentation, analysis and decision-making.
</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lectures</td><td>16.5 Hrs.</td></tr>
<tr><td>▪ Tutorials</td><td>7.5 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Self learning and recommended reading</td><td>80 Hrs.</td></tr>
<tr><td>▪</td><td>Hrs.</td></tr>
<tr><td>Total student study effort</td><td>104 Hrs.</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>Reference List:

Essential:

HKPolyU Building and Real Estate Department. Dissertation Guide. Continuously updated.</td></tr>
</table>

Recommended:

Bell, J. (1993) *Doing Your Research Project*, Open University Press.

Blaikie, N (2000) *Designing Social Research: The Logic of Anticipation*. Cambridge: Polity.

Booth, W.C., Colomb, G.G. and Williams, J.M. (2003) *The Craft of Research*, 2nd ed. Chicago: The University of Chicago Press.

Chau K.W., Raftery J. and Walker A. (1998) The Baby and the Bathwater: Research Methods in Construction Management. *Construction Management and Economics*, Vol. 16, No. 1, pp.99-104

Fellows R. and Liu A. (2008) *Research Methods for Construction*, 3rd ed., Blackwell-Science.

Harris R. and Cundell I. (1995) Changing the Property Mindset by Making Research Relevant. *Journal of Property Research*, 12, pp.75-78.

Holt G. (1998) *A Guide to Successful Dissertation Study for Students of the Built Environment, 2nd edition*. The Built Environment Research Unit, University of Wolverhampton.

Hussey, J. and Hussey, R. (2003) *Business Research: A Practical Guide for Undergraduate and Postgraduate Students, 2nd edition*. Basingstoke: Palgrave Macmillian, England.

Kennedy, P. (2003) *A Guide to Econometrics*, 5th Edition, USA: Blackwell Publishing.

Knight, A. and Ruddock, L. Ed. (2008) *Advanced Research Methods in the Built Environment.* Chichester: Wiley-Blackwell.

Kumar R. (1996) *Research Methodology: A Step-by-Step Guide for Beginners*. Addison Wesley Longman.

Levin R.I. and Rubin D.S. (1998) *Statistics for Management*, 7th edition, Prentice-Hall.

Lizieri C. (1995) Comment: Relevant Research and Quality Research: the Researcher's Role in the Property Market. *Journal of Property Research*, 12, pp.163-166.

Lucey T. (1992) *Quantitative Techniques ELBS.*

Mason, J (2002) *Qualitative Researching*. London: Sage.

Naoum S.G. (1999) *Dissertation Research and Writing for Construction Students*, Butterworth-Heinemann.

Pindyck, R.S. and Rubinfeld, D.L. (1998) *Econometric Models and Economic Forecasts*, 4th Edition, Boston: McGraw-Hill International Editions.

Raftery J., McGeorge D. and Walters M. (1997) Breaking Up Methodological Monopolies: A Multi-paradigm Approach to Construction Management Research.

Construction Management and Economics, 15(3), pp.291-297.

Render, B. and Stair, R.M. Jr (2000) *Quantitative Analysis for Management*, 7th Edition. Prentice Hall, New Jersey.

Tan, W. (2002) *Practical Research Methods*. Pearson Education Asia Pte Ltd., Singapore.

Subject Description Form

Subject Code	BRE391
Subject Title	Construction Technology II
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Pre-requisites: BRE291 or BRE294 or equivalent
Objectives	1. To identify and understand the range of advance technologies that is available and appropriate for the construction of contemporary buildings. 2. To facilitate an understanding of the centrality of technological decision making in the context of the wider construction process. 3. To provide the necessary skills to allow the evaluation of a range of technologies towards the adoption of an appropriate design and construction decision.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: (1) possess knowledge of processes and methods for the development of construction projects. (2) use the knowledge and methods for different types of construction. (3) solve the identified technological problems occurred during construction projects' processes. (4) apply the code of practice, environmental and safety issues into the construction processes.
Subject Synopsis/ Indicative Syllabus	The overall process of a construction project. Site production: engineering approach in producing the site layout and site planning. Sub-structural construction: deep foundations including pile foundations and caissons, basement's construction. Super-structural construction: reinforcement concrete structures, steel structures, composite building systems. Complex walls. System formworks. Environmental and safety issues in construction process. IT in construction process.
Teaching/Learning Methodology	Interactive Lectures will enable students to: 1. understand the working processes of high-rise buildings from sub-structure to super-structure. 2. analyse and compare alternatives in the process of building structures. 3. apply the theories and concepts to comply with environmental and safety constraints. Tutorial will enable students to consolidate the knowledge on technological methods throughout the building production process through problem-solving assignments, case study and discussions.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		1	2	3	4		
1. Coursework	30%	✓	✓	✓	✓		
2. Examination	70%	✓	✓	✓	✓		
Total	100 %						

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

Students could demonstrate their understanding on the subject through the preparation of coursework and presentation. Problem-based learning and case study approach will be used.

Students' overall understanding of the subject will be assessed in the examination, on both the theoretical knowledge and practical application.

Student Study Effort Expected

Class contact:	
▪ Lecture	21 Hrs.
▪ Tutorial	21 Hrs.
Other student study effort:	
▪ Self-development	57 Hrs.
▪ Coursework preparation	21 Hrs.
Total student study effort	120 Hrs.

Reading List and References

Recommended :

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.

Supplementary:

Allen E. (2009) *Fundamentals of Building Construction: Materials and Methods*. 5th Edition, John Wiley & Sons, New York.

Ambrose, J.E. (1992) *Building Construction and Design*. New York: Van Nostrand Reinhold.

Blanc, A. (1994) *Internal Components*, Mitchell, Longman.

	BRE (British Research and Establishment) Digests. Council on Tall Buildings and Urban Habitat (1995), *Architecture of Tall Buildings*, America: McGraw Hill. Chudley, R. (1999) *Construction Technology (Re. ed.).* 3rd Edition. England: Longman. Davies, V.J. and Tomasin, K. (1996*) Construction Safety Handbook*, 2nd Edition. London, Telford. Illingworth, J.R. (2000) *Construction Methods and Planning*. 2nd Edition. London: E&FN Spon. McEvoy, M. (1994) *External Components*. Mitchell, Longman. Nunnally, S.W. (2001) *Construction Methods and Management*. 5th Edition. Prentice Wong, W.M.R. (1998) *15 Most Outstanding Projects in Hong Kong*. Hong Kong: China Trend Building Press Ltd. Wong, W.S. (1991) *Building Materials and Technology in Hong Kong*, All Arts Ltd.

Subject Description Form

Subject Code	BRE3931
Subject Title	Temporary Work Design
Credit Value	4
Level	3
Pre-requisite / Co-requisite/ Exclusion	BRE291 & BRE204, or their equivalents
Objectives	Bring students' attention to the vertical integration of the subject areas learned in Level 2 such as Structure, Construction Technology, Engineering Mathematics along with the working experience gained in Industrial Centre to the subject areas of Level 3 Structure II & Construction Technology II through design project whilst the inter-relation of the horizontal integration between subjects are also important in solving a problem-based project work. Integrate and apply knowledge gained from individual subject areas in technology, management, economics and legal aspects.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a) Design falsework and formwork for building construction b) Appraise alternative solutions to falsework and formwork design c) Recognize the inter-relationship and interdependence of various areas in construction related to temporary works, such as cost, time, safety, and quality assurance d) Comprehend the design and construction operations, technology & structure, management, economics and legal impacts of the construction industry both locally and in other countries through guided learning and case study. e) Understand the implications of temporary design and construction in professional and social contexts; develop and improve communications skills and teamwork spirits in term project, and international/comparative study.
Subject Synopsis/ Indicative Syllabus	• Introduction, basic concepts of formwork and falsework. • Bamboo scaffolding: design and safety • Metal scaffolding: components, loads, foundations, and design • shoring design • Formwork materials, formwork types, and quality of finishes • Project handout and briefing • Design of slab forms • Design of wall forms • Design of beam forms • Design of column forms • Selection of horizontal formwork systems • Selection of vertical formwork systems • International study (for full time students) or comparative study (for part time students).

Teaching/Learning Methodology

Structured lecture/tutorial sessions are carried out at different stages during the progress of project to provide learning support to students in achieving the intended learning outcomes. Lecture/tutorial sessions of 1.5 hours per week are intended for teaching of key concepts, principles, and methods in temporary works design/application. The students are provided with useful resources on WebCT for self study.

A structured design project based on real life situation is to be used for term project and consists of the several components for applied learning:

1. Understand the structural elements of building components,
2. Prepare design of falsework systems to facilitate the construction of the structural elements.
3. Evaluate the different systems of formwork and falsework and to appraise alternation solutions.
4. Propose a suitable structural form for the formwork of various building components, and to prepare the subsequent design drawings, structural calculations and specifications
5. Produce plan and proposal for the falsework/formwork to facilitate building construction
6. Appreciate the multi-objective nature of building construction related to temporary works

For **international/comparative study**, the students are required to conduct a comparative study of the construction and real estate industry of selected Asia Pacific countries and Hong Kong. A study tour or equivalent is to be organized by students. Students will select a country/region to study the structure of the property and construction industries on a wide range of topic areas of their visit to the organizations of the selected country, which may include government bodies, research institutions, universities, construction contractors and consultants, property developers, etc. The study tour will be organized by students between semesters. On completion of the tour, students are asked to prepare a report on what they have observed and to carry out a critical comparison between the country visited and Hong Kong. Also, a public presentation will be arranged to let students present their findings in a formal situation. It must be emphasized that input from teaching staff on the study tour is kept to a minimal and is provided as guidance in order to allow the student more autonomy to administer the projects and learn through the process of planning and execution. A final report and a public lecture for the International Studies will be presented and assessed by the Project Tutor.

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. Temporary Works Design Report	75%	✓	✓	✓	✓	✓	
2. Study tour and report for full time programme/Comparative Study Report for part time programme	15%				✓	✓	
Total	100 %						

	Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes: The subject is project-based, the students will work in groups to complete the design report/study report, which requires efforts from each team members to demonstrate that the group understands the problems and documents the solutions in a professional report.	
Student Study Effort Expected	Class contact:	
	▪ LEC	21Hrs.
	▪ PW	56Hrs.
	Other student study effort:	
	▪ SELF-STUDY/REPORT WRITING	120 Hrs.
	▪	Hrs.
	Total student study effort	197 Hrs.
Reading List and References	**Reading List:** No standard textbook is recommended, since students have to refer to various literatures in order to achieve the requirement of the design project. Reference will be made to current articles in journals, local newspaper, would press, proceedings dealing with topics of current importance. **Recommended:** The Concrete Society (1995), *Formwork A guide to good practice*, 2nd Edition. Illingworth J.R. (1987). *Temporary Works: Their Role in Construction*, Thomas Telford, London. Labour Department (2001). *Code of Practice for Metal Scaffolding Safety* Chudley, R. (1999). *Advanced Construction Technology*, 3rd ed. revised by Roger Grano, Longman. Illingworth, J.R. (2000). *Construction Methods and Planning*, 2nd ed., E & FN Spon.	

Subject Description Form

Subject Code	BRE398
Subject Title	Building Information Modeling (BIM)
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	1. Provide students with an overview of the application of BIM in building lifecycle, especially in building engineering and construction management; 2. Develop an understanding of the practical method to apply and operate BIM in contemporary building projects.
Intended Learning Outcomes	*Students will demonstrate their ability to:-* 1. Understand the concept of BIM and the constituents of BIM models; 2. Understand the functions and benefits of BIM in building engineering and construction management; 3. Use some typical software packages to build or operate basic BIM models; 4. Apply BIM technology to building projects so as to solve some problems occurring in building projects.
Subject Synopsis/ Indicative Syllabus	Emergence and development of BIM: background and development. Basic concepts related to BIM: BIM, 4D, and construction virtual prototyping. Functions and benefits of BIM: building lifecycle - design, tendering, construction, and maintenance. Software packages for BIM: Autodesk Revit, and Catia - Dassault Systemes. Practical method of applying BIM: barriers, principles, and a real-life case. Some representative cases of adopting BIM: mega or complex building projects.
Teaching/Learning Methodology	Lectures and workshops will be delivered through the whole semester. Lectures will be used to introduce the basic concepts and functions of BIM and the method to employ BIM technology in building projects, and also to demonstrate some successful cases in which BIM has been adopted, while small group-based workshops will be applied into the study of software packages for BIM and project-based BIM application in different phases. Guest speakers will also be invited to give some seminars on the latest development and application of BIM technology.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		1	2	3	4		
1.course work	40	√	√	√	√		
2. exam	60	√	√	√			
Total	100 %						

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

Examination and coursework will constitute 60% and 40% of the overall mark for the subject respectively. Coursework mark will be based on presentation and exercises. Exercises will be conducted based on the application of BIM to different phases of building projects.

Student Study Effort Expected

Class contact:	
▪ lectures	21Hrs.
▪ tutorials	21Hrs.
Other student study effort:	
▪	Hrs.
▪	Hrs.
Total student study effort	Hrs.

Reading List and References

Eastman, C., Teicholz, P., Sacks, R. and Liston, K. (2008) *BIM handbook: a guide to building information modeling for owners, managers, designers, engineers, and contractors*, John Wiley and Sons.

Eastman, C.M. (1999) *Building Product Models: Computer Environments Supporting Design and Construction*, CRC Press LLC.

Elvin, G. (2007) *Integrated practice in architecture : mastering design-build, fast-track, and building information modeling*, John Wiley and Sons.

Hardin, B. (2009) *BIM and Construction Management: Proven Tools, Methods, and Workflows*, John Wiley and Sons.

Kymmell, W. (2008) *Building information modeling: planning and managing construction projects with 4D CAD and simulations*, McGraw-Hill.

Smith, D.K. and Tardif, M. (2009) *Building information modeling: a strategic implementation guide for architects, engineers, constructors, and real estate asset managers*, John Wiley and Sons.

Supplementary:

Krygiel, E., Nies, B. and McDowell, S. (2008) *Green BIM: successful sustainable design with building information modeling*, John Wiley and Sons.

Subject Description Form

Subject Code	BSE332
Subject Title	Fire Services
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	BSE2214 HVACR Fundamentals II or BSE2280 HVACR Fundamentals
Objectives	The subject aims to enable students to: • use codes of practices for fire engineering designs; • design basic water-based fire engineering systems for buildings in Hong Kong; • design gas protection systems; • design fire detection and alarm systems; and • understand basic passive protection systems in buildings.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: (a) design basic fire services systems for buildings; (b) understand and appraise the governing legislation, rules and codes of practices related to the fire services systems; and (c) link relevant fundaments with practical design and make rational choices of the systems, materials and equipment based on both economics and performance.
Subject Synopsis/ Indicative Syllabus	**Introduction to building fires and fire services systems:** Fundamental concepts of fire, fire triangle, properties of fuel, fire load, fire extinguishing mechanisms, fire fighting agents, fire process, ignition, fire growth, flashover, and heat transfer. **Fire safety provisions and code requirements:** Laws of Hong Kong, building regulations, provisions of fire service installations, codes of practice for means of escape, fire resisting construction, means of access for fire fighting and rescue. **Water-based systems:** Sprinkler heads, sprinkler systems, fire hydrant and hose reel systems. Stand-pipe, wet, dry, pre-action, drencher, and water mist systems, etc. System components, source of water supply, design hazard classifications, water discharge density, pipe sizing methods, pump duty, system pressure and flow characteristics, high-rise systems, operation and maintenance, and case studies. **Gas protection systems:** Halon and halon alternatives, CO_2 systems, FM200 systems, system components and layouts, operation and maintenance. **Fire detection and alarm systems:** Selection of detectors, components and layouts, cross zoning, beam detection systems, application of codes and design guides, and audibility of fire alarm. **Passive fire protection systems:** Design of passive fire safety measures. Fire resistance and fire resisting construction, compartmentation, building evacuation, means of access for fire-fighting, and refuge floor.

Teaching/Learning Methodology

Teaching approach includes lectures, tutorials, in-class assessment, student-based seminars/ case studies, laboratory work and examination to facilitate learning. Designs of fire services systems, applications of technical data, regulations, standards and guidance notes prepared by various statutory bodies and others will be discussed in lectures with all intended learning outcomes to be achieved.

Tutorials will be used to support lectures, including discussions on problem areas and on solving tutorial questions. Student participation is expected in solving selected examples in tutorial work, including examination questions and longer open-ended problems. In addition, visual aids such as films and slides will be shown and discussion will be held during tutorials in order to develop a better understanding of the subject. These will facilitate learning to achieve all intended learning outcomes.

Related design work on automatic sprinkler systems, fire hydrant and hose reel systems, fire detection and automatic fire alarm systems will be included. Assignment work includes problem solving and in-class assessment which will evaluate student's understanding of the knowledge being taught. Student-based seminars and examination will also achieve all the intended learning outcomes.

Related laboratory work is an integral part of this subject, to serve as a vehicle for contrasting theory with practice, and provide students familiarity with equipment and testing techniques. Laboratory sessions will be jointly organized together with other technical subjects of the programme, but will be assessed as part of this subject. Topics include investigation of the characteristics of water mist system, use of thermocouple in fire engineering, smoke movement using water models, conventional and addressable fire alarm systems. Laboratory work mainly helps to achieve the intended learning outcome on designing the basic fire services systems for buildings.

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. In-class assessment	10	✓	✓				
2. Student-based seminar	10	✓	✓	✓			
3. Laboratory work	10	✓					
4. Examination	70	✓	✓	✓			
Total	100 %						

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

1. In-class assessment, usually in the format of closed book test, is delivered with questions to evaluate the students' understanding on fire basic, passive and active fire safety design for buildings, fire detection and alarm systems and sprinkler system design etc. The intended learning outcomes (a) and (b) can be achieved through this assessment.

2. Student-based seminars on fire engineering system design and performance evaluation with group presentation and group report submission is to ensure that students can achieve critical thinking and all-roundedness with professional competence defined by the programme outcomes. Seminars will facilitate learning and achieve all intended learning outcomes.

3. Laboratory sessions allow students to understand how to design fire protection systems. Intended learning outcome, in particular (a) will be achieved.

4. Examination is the final assessment for students to ensure their understanding and learning abilities. All intended subject learning outcomes will be achieved.

Student Study Effort Expected	Class contact:	
	• Lecture and seminar	30Hrs.
	• Tutorial	7Hrs.
	• Laboratory	9Hrs.
	• In class assessment	2Hrs.
	Other student study effort:	
	• Self study, laboratory reports, seminar assessment and exam preparation etc.	72Hrs.
	Total student study effort	120Hrs.
Reading List and References	Buildings Ordinance and Regulations, Laws of Hong Kong, Hong Kong Special Administrative Region (HKSAR). Code of Practice for Fire Resisting Construction, Building Authority, Hong Kong, 1996. Code of Practice for the Provision of Means of Access for Firefighting and Rescue, Buildings Department, Hong Kong, 2004. Code of Practice for the Provision of Means of Escape in Case of Fire, Building Authority, Hong Kong, 1996. Codes of Practice for Minimum Fire Service Installations and Equipment and Inspection, Testing and Maintenance of Installations and Equipment, Fire Services Department (FSD), HKSAR, 2005. Chartered Institution of Building Services Engineers (CIBSE) Guide E: Fire Safety Engineering, CIBSE, London, UK, 2010. Fire Protection Handbook, 20th Edition, National Fire Protection Association (NFPA), Quincy, USA, 2008. Laws of Hong Kong with Ordinance and the Sub-leg Regulations, HKSAR. List of FSD Circular Letters, especially No. 3/2006 and No, 1/2009, http://www.hkfsd.gov.hk/home/eng/circular.html. Loss Prevention Council LPC Rules for Automatic Sprinklers Installations Incorporating British Standard BS EN 12845:2003 – Fixed firefighting systems – Automatic sprinkler systems – Design, installation and maintenance, LPC, UK, 2003. Sturges, J.L., Fire safety and buildings, Blackwell Science, 2003.	

Subject title: Workplace English for the Faculty of Construction and Land Use

Subject code: ELC3403

Credit value: 3

Pre-requisites: Nil

Contact hours: 42

Objective

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

Learning outcomes

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

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

Content

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

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

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

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

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

Teaching and learning approach

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

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

Assessment

Continuous assessment: 100%

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

Indicative references

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

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

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

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

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

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

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

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

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

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

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

Subject title: Job Application Skills (ELC3401 top-up)

Subject code: ELC3404

Credit value: 1

Pre-requisites: ELC3401 English in the Workplace for Faculty of Construction and Land Use Students

Contact hours: 14

Objective

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

Learning outcomes

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

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

Content

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

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

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

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

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

Teaching and learning approach

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

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

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

Assessment

Continuous assessment: 100%

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

Indicative references

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

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

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

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

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

Level 4 Subjects:

BRE 401	Construction Technology III
BRE 4051	Project Evaluation and Development
BRE 415	Dispute Resolution
BRE 418	Real Estate Development
BRE 426	Geotechnical and Foundation Engineering
BRE 427	Applied Property Investment
BRE 4281	Construction Engineering Management
BRE 4291	Real Estate Marketing
BRE 435	Design, Adaptation and Conversion
BRE 436	Applied Property Valuation
BRE 437	Facility Management
BRE 439	Engineering Contract Procedure
BRE 440	Cost and Value Management
BRE 441	Professional Studies
BRE 442	Forecasting & Competition in the Built Environment
BRE 450	Building Maintenance for Sustainability
BRE 453	Building Services II
BRE 477	Dissertation

Subject Description Form

Subject Code	BRE401
Subject Title	Construction Technology III
Credit Value	3
Level	Level 4
Pre-requisite / Co-requisite/ Exclusion	BRE391
Objectives	This subject is intended to: 1. examine building production during construction, in which advanced construction technologies and effective management technique are integrated. 2. to introduce special construction process like demolition. 3. introduce the concepts of sustainable design and construction.
Intended Learning Outcomes	*Students will demonstrate their ability to:-* 1. Solve the technological problems found on sites by workable solutions. 2. Assess and apply appropriate techniques to building production problems. 3. Apply a strategic approach to technological issues from the senior construction management point of view.
Subject Synopsis/ Indicative Syllabus	• *Site production*: methods of demolition and safety, building production systems, engineering approach in site/production planning, scheduling and control techniques. The integration of architectural, structural and building services in construction production. • Environmental protection and Sustainability in building design and construction. • *Concrete production*: prestressing, post-tensioning and high-strength concrete, quality control; heat control and cooling systems in mass concrete production. • *Prefabrication*: on-site and off-site production and fabrication, transportation to site, and site installation. • Robotic in construction. • Health and Safety in Construction. • Addition and Alternation works.
Teaching/Learning Methodology	Interactive lectures are used to identify construction issues, to generate and explain the concepts. Theories and practices in construction production and planning and hence how to solve the problem arisen. Tutorials are conducted with the aim to consolidate the subject matters learned in the lectures and to view different perspectives of construction problems and solutions. In the lectures and tutorial, case studies are used to analyze and interpret the issues, solutions and practices of construction projects. Site visit would be arranged to incorporate what are learned in classroom situations to a real-life situation to further enhance the knowledge of application and integration of theories and practices. Seminar presentations are arranged for students to work in team to investigate topics either presented in lectures/tutorials or contemporary issues or state-of-art construction practices or case study of the construction of a particular building, etc. The learning emphasis will be on developing the students' analytical and critical approach to the solutions of production problems with particular reference to the production techniques and management issues in local situations.

Assessment Methods in Alignment with Intended Learning Outcomes	Assessment includes both written examination and coursework assignment. Students are assessed their abilities in solving technological problems found in construction project taking into account of the assessment and application of appropriate techniques and methods with a strategic approach from the construction management point of view. The coursework mark will be based on seminar presentations and report, and site visit reports. In both coursework and examination, students should demonstrate their application and appraisal of concepts and knowledge. Examination and coursework will constitute the 70% and 30% of the overall marks of the subject respectively.	
Student Study Effort Expected	Class contact:	
	▪ Lecture	21 Hrs.
	▪ Tutorial	21 Hrs.
	Other student study effort:	
	▪ Site Visit	3 Hrs.
	▪	Hrs.
	Total student study effort	120 Hrs.
Reading List and References	**Reading List:** Chew, Y.L.M. (2009) *Construction Technology for Tall Building 3*rd edition. Singapore: World Scientific. Illingworth, J.R. (2000) *Construction Methods and Planning*. 2nd edition. London, New York : E & FN Spon Nunnually, S.W. (2004) *Construction Method and Management*, 6th edition, Upper Saddle River: Prentice Hall Hamer, M. (1999) *Construction: A 2020 Vision Report*, London: Construction Industry Board Council on Tall Buildings and Urban Habitat, (1995) *Architecture of Tall Buildings*, McGraw-Hill Harris F. & McCaffer R. (2006) *Modern Construction Management*, 6th Edition, Blackwell Science So, A.T.P. & Chan, W.L. (1999) Intelligent Building Systems, Kluwer Academic. Naylor H. (1995) *Construction Project Management: Planning and Scheduling*, Delmar Neale R., Price A. & Sher W. (1993) *Prefabricated Modules in Construction*, CIOB	

	Vallero D. & Brasier C. (2008) Susyainable Design – The Science of Sustainability and Green Engineering, John Wilry & Son. **Supplementary:** Allen E. (1999) *Fundamentals of Building Construction: Materials and Methods*, 3rd Edition, John Wiley & Sons CIOB (1995) *Time for Real Improvement: Learning from Best Practice in Japanese Construction R&D*, CIOB CIOB (1991) *Planning and Programming in Construction: A Guide to Good Practice*, CIOB

Subject Description Form

Subject Code	BRE4051
Subject Title	Project Evaluation and Development
Credit Value	5
Level	4
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	Develop students' ability to critically evaluate, synthesize and integrate knowledge gained from a variety of sources related to the construction development process; and provide the skills necessary to document and present proposals for the development of a construction project from inception to hand over.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Evaluate the major issues involved in the process of developing a site for a client b. Identify the relevant laws, regulations and procedures that must be complied with through the development process c. Effectively adopt a teamwork approach to developing a project d. Propose solutions to complex technology and management problems associated with the proposal and development of a project e. Communicate effectively in a managerial role, including effective presentation of analysis, justification of recommended actions, and persuasive messages intended to affect the perception of others. The above learning outcomes reinforce the programme learning outcomes contained in the Programme Document, as well as the all-rounded attributes of students.
Subject Synopsis/ Indicative Syllabus	Students are required to select a site and formulate original proposals for its development or redevelopment. This involves addressing the whole range of activities involved at the conception, design, construction and disposal stages of a typical construction project. The intention is to improve students' comprehension of the whole development process. The fact that the vacant land or existing buildings are real means that the planning, commercial, and amenity aspects can be thoroughly researched.
Teaching/Learning Methodology	The pedagogical philosophy for this subject is student-centred learning through project work. Students are "enabled" to adopt the self-study approach by using their own initiative to gain knowledge and apply it to a series of inter-related tasks in a realistic situation. The project work consists of 2 phases, occurring in Semester 1 and 2 respectively. In Phase I, students either select their own sites with preset criteria or are allotted sites from information made available in the public domain. Individually, they formulate original proposals for development or re-development of the chosen sites, with economic, social and technical justifications (in the form of feasibility study). Each student is required to submit a written report and present findings for assessment. In Phase 2, after deciding on the best development to go ahead, students work in groups

to propose procurement methods, set out design team briefing information, identify necessary planning and regulatory approvals, propose production control measures and disposal methods. A group report and presentation form part of the assessment process.

At the beginning of each phase, students are briefed on the important factors affecting their works through lectures. A subject website has also been established providing stage-by-stage guidelines and resources for students to progress. Upon submission of reports and presentations, feedback is provided to individual students. In Sem 2, an on-line test is arranged to ensure that students have done their reading. Throughout the project process, designated staff members are available for consultation with timetabled hours for tutorials.

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.Phase 1 presentation	20%	√			√	√	
2. Phase 1 written report	30%	√			√	√	
3.Phase 2 presentation	10%		√	√		√	
4. Phase 2 written report	25%		√	√		√	
5. On-line test	15%	√	√				
Total	100 %						

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

This is a continuously assessed subject with no examination.

In Phase 1, students submit individual reports and present their major findings. The assessment is focused on individual skills and Subject Outcome a, d and e.

In Phase 2, group reports are submitted with presentations. The assessment is focused on team work skills and Subject Outcome b, c and f.

An individual on-line open-book test in the mid of Sem 2 consisting of multiple choice questions. A different set of questions is generated for each student. This test is mainly to ensure that students have done their reading when they work on the integrated project.

The Assessment Models for Phase 1 and Phase 2, with clear assessment criteria for both the presentation and the written report submissions, are shown on the subject website.

Student Study	Class contact:	

Effort Required	▪ Lectures	6 Hrs.
	▪ Seminar Presentations	7 Hrs.
	▪ Tutorials	8 Hrs.
	Other student study effort:	
	▪ Independent study	100 Hrs.
	▪ Project work	100 Hrs.
	Total student study effort	221 Hrs.
Reading List and References	Cadman D. (1995). *Property Development.* E & F.N. Spon Collier C.A. (1994). *Construction Funding: Where the Money Comes From*. Willey Darlow C. (1988). *Valuation and Development Appraisal* Estates Gazette Harrison, F.L. (1992). *Advanced Project Management: A Structured Approach*. Gower Higson, C.J. (1995). *Business Finance*. Butterworths Rougvie A. (1987). *Project Evaluation and Development*. Mitchell The Chartered Institute of Building (1996). *Code of Practice for Project Management: For Construction and Development* Walker A. (2007). *Project Management in Construction*. Blackwell Publishing Sidney, L.M. (2007) *Project Management in Construction,* McGraw-Hill Other references as listed on the subject website.	

Subject Description Form

Subject Code	BRE415
Subject Title	Dispute Resolution
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	BRE206
Objectives	Provide an understanding of the aspects of law and procedures relating to the resolution of dispute in the construction industry and develop students' ability to appropriately apply theoretical aspects of dispute resolution to practical solutions.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Explain the evolution of dispute resolution in an international context. b. Identify the relevant laws, regulations and procedures and apply them to the resolution of disputes in Hong Kong's construction industry. c. Analyse the process of arbitration, mediation, litigation and adjudication; d. Evaluate the implications involved, in terms of contractual and business relations, when making decisions about the choice of method to be used to settle construction related disputes. e. Propose solutions to complex construction dispute cases both orally and in writing. f. Communicate effectively
Subject Synopsis/ Indicative Syllabus	Litigation as a means of settling disputes. Origins of arbitration and of alternative dispute resolution (ADR) Different forms of ADR. Dispute resolution process in Hong Kong. Application of laws relating to litigation, arbitration and ADR. Law of civil evidence.
Teaching/Learning Methodology	The course is conducted by way of problem-based learning. Before each of the lectures, the students are given problem scenarios around which the lecturing materials are built. During the lectures, the problems are discussed and feedback will then be given. The problem scenarios are designed with the purpose of achieving the intended learning outcomes. By preparing, attending and involving in the discussion and debate during the lectures, the outcomes are achieved.

	The knowledge acquired by the students then forms the fundamental knowledge of the students about the subject. The assessment methods, which stated below, then give the students the opportunity to widen the scope of their knowledge over the subject and to apply the knowledge in real situation.
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	f
1. Oral presentation, written report relating to the practical, procedural or legal aspects of topics which have not been covered by first assignment. After the presentation, questions are put to the students by the lecturer/tutor to test the students' abilities in applying the knowledge they acquired.	50	√	√	√	√	√	√
2. Oral presentation and written report relating to the theoretical aspects of the topics covered by the syllabus. After the presentation, questions are put to the students by the lecturer/tutor to test the students' abilities in applying the knowledge they acquired.	50	√	√	√	√	√	√
Total	100 %						

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

Assessments for this module will be by two Coursework Assignments. There will be no assessment by examination.

	The assessments are designed to contribute to learning, and to determine the extent to which a student has achieved the ILO and hence the programme outcome. For the first assignment, problem scenarios are designed by the lecturer. The students are required to form groups to complete the assignment by selecting one of the problem scenarios and to present their answers. In addition, each of the groups is required to submit a written report relating to the presentation. For the second assignment, each group is required to select any topic covering by the syllabus and the topic cannot be those already been dealt with in the first assignment by any of the problem scenarios. The students are them required to make a presentation relating to the topics they have selected and to submit a written report relating to the presentation. Both of the assignment are designed to test the students' abilities to: 1. organize themselves with minimal instructions 2. organize through negotiation with other members of the same group without direction from the tutors or lecturer 3. work in a team environment 4. coordinate or negotiate selection of topics with other groups 5. complete the task through the use of initiative and ingenuity, *i.e.*, creativity and cleverness 6. use effectively the resources available to the students in the library and on-line 7. test the students' knowledge and the ability to apply the concepts that they have learnt as well as the students reasoning ability and their abilities in making critical judgment. In that way, whether the students have acquired the abilities as statement in the ILO above can be assessed.	
Student Study Effort Expected	Class contact:	
	▪ Lecture	21 Hrs.
	▪ Tutorial	21 Hrs.
	Other student study effort:	
	▪ Self studying. Preparation for discussion of the problems to which the lectures relate and doing the course works.	120 Hrs.
	▪	Hrs.
	Total student study effort	120 Hrs.
Reading List and References	**Reading List and References:** Goldberg, S. B. (1999), *Dispute Resolution: Negotiation, Mediation and other Processes*. Aspen Law & Business Hills, M.J. (2001), *Building Contract Procedures in Hong Kong*. Longman Hong Kong Education Kaplan, N. (1994), *Hong Kong & China Arbitration: Cases and Materials*, Butterworths Asia. Morgan, R. (1997). *The Arbitration Ordinance of Hong Kong: A Commentary with 1997 Supplement*. Butterworths Asia.	

	Tapper, R. (1990). *Cross on Evidence*, Butterworths Uff, J. (1996), *Construction Law & Practice Relating to the Construction Industry,* Sweet & Maxwell. **Supplementary:** Chan, E. H. (1997). Amicable Dispute Resolution in the PRC and its Implication for Foreign-related Construction Disputes. Construction Economics and Management, Nov. 1997, Vol.15, No. 6, pp.539-548. Fenn, P.; O'Shea, M. & Davies, E. (eds.)(1998). Dispute Resolution and Conflict Management in Construction: An Internation Review. E. & FN Spon. Hills, M.J. (1992), *A Case for an Alternative Approach to the Resolution of Disputes Under JCT 80 Standard Form of Building Contract, MSc dissertation (Supervisor: Dr. R.F. Fellows)*, University of Bath Kaplan, N. (1983), *Hong Kong Arbitration Cases and Materials*, Butterworths Asia Langan, P. St. J. (1983), *Civil Procedures*, Sweet & Maxwell Merkin, R. (1996), *Arbitration Act 1996: An Annotated Guide*, Lloyds of London Press Relevant Ordinances and Regulations of the Hong Kong Government **Others:** 1. Those being stated in the syllabus of the course. 2. Other suggested reading: : the latest edition of the following books 2.1. Building Contract Procedures in Hong Kong 2.2. Hong Kong Civil Procedures, i.e. the White Book. 2.3. HKIAC rule of arbitration 2.4. Brookers' Arbitration Law and Practice 2.5. Arbitration in Hong Kong – A Practical Guide. 2.6. The related ordinances of the Hong Kong Special Administrative Region.

Subject Description Form

Subject Code	BRE 418
Subject Title	Real Estate Development
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	This subject is intended to provide an integrated and consolidated intellectual framework for students to comprehend and analyze the current factors and key issues in affecting production and consumption of the built environment in society.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: 1. Describe and evaluate the existing research literature on land and property development. 2. Describe and evaluate the complex and dynamic process of real estate development, with special reference to the local context. 3. Distinguish and explain the significance of all the key social, political, economic, physical and regulatory factors affecting the performance of the property development industry. 4. Appraise the theoretical models and concepts in analyzing the current issues in property development. 5. Synthesize knowledge from various disciplines and apply them in solving practical problems in real estate development. 6. Communicate and present ideas in a clear and articulate manner using appropriate academic conventions
Subject Synopsis/ Indicative Syllabus	*Real Estate Development Model and Process:* Models of Development Process; Strengths and Weaknesses of Development Models; Factors Influencing Real Estate Development; Transformation of Urban Built Environment. *Public Sector Regulations and Development Potential:* Concepts of Project Feasibility; Approaches in Development Control Decision Analysis; Political vs Technical Factors in Government Regulations; Judging Development Control Decisions. *Current Issues in Real Estate Development:* Property Finance and Property Cycles; Globalization of Real Estate; Land Development in China; Property-led Urban Regeneration. *Different Types of Real Estate Development:* Office, Residential and Industrial Development.
Teaching/Learning Methodology	Lectures - The lectures provide an explanation and evaluation of the important theories, models and concepts in the course contents. Interactive Tutorial Sessions - Tutorials are organized for students to intensively evaluate the relevance of the research literature and/or work on particular problems in real estate development. Students are required to present and communicate their ideas and/or discuss their recommendations at the tutorials. Some tutorials may be conducted on-line, if appropriate. Coursework may comprise short quizzes, tutorial

	assignments and short essays. Final examination normally comprises essay type questions.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		1	2	3	4	5	6
1. Written assignment	12.5 %	√	√	√	√		√
2. Class exercises	12.5%	√	√		√		
3. Quizzes	25%	√	√	√	√	√	
4. Final Examination	50%	√	√	√	√	√	√
Total	100%						

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

Assessment consists of both coursework and final examination. Short quizzes/class exercises/written assignments are continuous assessments that cover all the learning units in this subject. They assess the students' abilities to identify, appraise and evaluate the literature. The Final Examination covers essay-type questions and allows students to further synthesize the knowledge and apply to practical scenarios and specific situations.

Student Study Effort Expected

Class contact:	
▪ Lecture	21 Hrs.
▪ Tutorial	21 Hrs.
Other student study effort:	
▪ Coursework assignments	56 Hrs.
▪ Independent Self-study	82 Hrs.
Total student study effort	180 Hrs.

Reading List and References

Adams, C.D., Russell, L. & Taylor-Russell, C.S. (1993). Development constraints, market processes and the supply of industrial land. *Journal of Property Research*, 1993(10), 49-61.

Brueggeman, W. B. (1995). The impending recovery in ten major office markets: A strategic assessment of suburban versus CBD conditions. *Real Estate Finance*, 12(1), p.32-39.

Charney, I. (2007). Intra-metropolitan preferences of property developers in greater Toronto's office market. *Geoforum*, 38(6), 1179-1189.

Coakley, J. (1994). The integration of property and financial markets, *Environment and Planning A*, 26, 697-713.

Daniels, P. W., & Bryson, J. R. (2002). Manufacturing services and servicing manufacturing: knowledge-based cities and changing forms of production. *Urban Studies*, 39(5-6), 977-991.

De Magalhaes, C. (1998). Economic instability, structural change, and the property markets: the late-1980s office boom in Sao Paulo. *Environment and Planning A*, 30(11), 2005-2024.

Gospodini, A. (2006). Portraying, classifying and understanding the emerging landscapes in the post-industrial city. *Cities*, 23(5), 311-330.

Henneberry, J. (1988). Conflict in the industrial property market. *Town Planning Review*, 59(3), 241-262.

Hutton, T. A. (2004). Post-industrialism, post-modernism and the reproduction of Vancouver's central area: retheorising the 21st-century city. *Urban Studies, 41*(10), 1953-1982.

Knox, P. L. (1991). The restless urban landscape: economic and sociological change and the transformation of Metropolitan Washington, D.C. *Annals of the Association of American Geographers*. 81(2), p.181-209.

Mueller, G. R. (1995). Understanding real estate's physical and financial market cycles. *Real Estate Finance*, 12(3), p.47-52.

Tang, B.S. and Yiu, C.Y. (2010) Space and scale: a study of development intensity and housing price in Hong Kong. *Landscape and Urban Planning*. 96 (3), 172-182.

Wu, F. (1998). The new structure of building provision and the transformation of the urban landscape in metropolitan Guangzhou, PRC. *Urban Studies*, 35(2), p.259-283.

Subject Description Form

Subject Code	BRE426
Subject Title	Geotechnical and Foundation Engineering
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	CSE290 & BRE302
Objectives	a) Provide students with knowledge of the basic principles of geotechnical engineering and the relation and implications to foundation choices and designs and the ground works needed to be carried out.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a) Apply the understanding of soil properties, mechanics principles and theories to the behaviour of soils under different kinds of pressures and the effects of water. b) Relate the importance of safety and geotechnical considerations in designing/undertaking site formation and earth-retaining works. c) Describe the basics concepts of soil mechanics and its application to analyze soil retaining structures. d) Illustrate an understanding of modern soil improvement techniques and retaining slopes, soil and excavation techniques. e) Appraise foundation design concepts in the choice of appropriate foundation and design simple foundations.
Subject Synopsis/ Indicative Syllabus	*Soil Mechanics and Geology:* Shear strength of soil, lateral earth pressure. Site investigation for deep and complex foundation/basement design and construction, interpretation of borehole log (field and laboratory tests). *Site Formation:* Techniques of excavation and de-watering. *Stability of Slopes and Earth Retaining Structure:* Slope stability, drainage of slopes, ground anchor, slope protection methods. Active and passive lateral earth pressures, analysis and design of soil retaining structures in particular gravity retaining walls, cantilever and anchored sheet pile walls, diaphragm walls, braced or strutted excavation, failure of retaining structure. *Foundation Design and Geotechnical Problems :* Ground & soil stablisation improvement: compaction and pre-compaction, grouting and chemical stablisation, vibratory methods, soil reinforcement and the use of geosynthetics for drainage. Stresses in subsoil, load bearing capacity and settlement of foundations, rate/magnitude of settlement; factors to be considered in foundation design; pile foundation method and construction process of percussion and bored piles, pile capacity and pile driving formula, plant and equipment for piling, pile testing and Code of Practice.

Teaching/Learning Methodology

Interactive Lectures will enable students to:
1. Appreciate basic concepts of soils mechanics.
2. Relate geotechnical considerations regarding construction works.
3. Apply the soil mechanics concept to analyse slope stability, retaining wall structure and design simple foundations.

Tutorial will enable students to:
1. Consolidate the geotechnical and foundation engineering concepts through problem-solving assignments and discussions.

Laboratory will enable students to:
1. Identify and appreciate the shear strength and permeability of soils.

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. Problem-solving assignment	12	√	√	√	√	√
2. Laboratory report	3	√				
3. Mid-term test	15	√	√			
4. Final examination	70	√	√	√	√	√
Total	100 %					

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

The problem –solving assignments are used to assess students' ability to solve geotechnical and foundation engineering problems with good numerical accuracy based on the theories and concepts studied in the lectures.

The laboratory report is used to assess students' ability to observe and verify the shear strength and the permeability of soils and to present the experimental results in a logical and clear format.

The mid-term test and the final examination are used to assess students' i) understanding of the geotechnical and foundation engineering theories and concepts learned in the lectures and ii) ability to solve geotechnical and foundation engineering problems with good numerical accuracy.

Student Study Effort Expected

Class contact:	
▪ Lecture	21 Hrs.
▪ Tutorial and Laboratory	21 Hrs.
Other student study effort:	
▪	120 Hrs.
▪	Hrs.
Total student study effort	162 Hrs.

Reading List and References	**Recommended Text** Das, B M "Introduction to Geotechnical Engineering". ISE. 2nd edition, 2008, Thomson. **References** Bowles J E "Foundation analysis and design" McGraw Hill. Tomlinson M.J. "Foundation design and construction", 2001 Prentice Hall. Tomlinson M.J. "Pile design and construction practice", 1994 E & FN Spon. *****Liu C and Evett J B "Soils and Foundations" 5th edition, Prentice Hall. ***** Coduto D P "Geotechnical Engineering Principles and Practice 1999, Prentice Hall. Geotechnical Engineering Office Geoguides 1,2 and 3; CED Hong Kong Government, Government Publication Centre. Pile design and construction, GEO Publication No. 1/96 CED Hong Kong Government. ** Good reference books*

Subject Description Form

Subject Code	BRE427
Subject Title	Applied Property Investment
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	BRE315 and BRE319/ Nil/ Nil
Objectives	This subject is intended to: 1. Give to the students an appreciation of the scope of real property investment. 2. Enable them to apply the techniques available to select suitable investment vehicles for different types of investor under different market conditions. 3. Enable the students to apply the techniques in business valuation to solve practical problems.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: 1. Identify and analyse of the investment environment for real estate in Hong Kong, PRC and Overseas. 2. Recognise the scope of real estate investment in Hong Kong. 3. Use their knowledge to solve practical problems in real estate investment business and business valuation.
Subject Synopsis/ Indicative Syllabus	Rationale of property investment: major investors in real property in the public and private sectors; principal types of real property investment and their characteristics; causes for historical property market cycles, present market trends and projections; direct and indirect investment; securitization such as REIT (real estate investment trust) in the property market; property investment in the People's Republic of China and overseas. The investment decision: sources and manipulation of information; analysis of direct real property investments; comparative investment analysis; returns on investment; risk and uncertainty. Investment psychology. Analysis of indirect property investment (business valuation): Open market and notional market; Approaches to value determination: Going Concern approach and Liquation Value approach; Valuation techniques: asset-based techniques, Income approach and market approach; Market capitalization and discount rates; Goodwill valuation.
Teaching/Learning Methodology	Emphasis is made on the application of the investment principles and techniques developed over the past two years to solve actual problems in property investment. Students' awareness on the investment market, particularly the real estate investment market, will be enhanced. It will be learnt through case studies, problem-solving exercises, presentation etc. Discussion will be facilitated in small tutorial groups. Lectures, seminars, projects and tutorials will form the basic skeleton for learning the subject.

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:

Examination and coursework will constitute 70% and 30% of the overall mark for the subject respectively. The coursework mark will be based on the assignments and presentations. Both examination and coursework assess learning outcomes 1 to 3.

Student Study Effort Expected

Class contact:	
▪ Lecture	21 Hrs.
▪	Hrs.
Other student study effort:	
▪ Seminar/ Tutorial	21 Hrs.
▪	Hrs.
Total student study effort	42 Hrs.

Reading List and References

Recommended:

Andrew Baum (1995), Property Investment Appraisal, 2nd edition

Brown R. Gerald (2000), Real Estate Investment: a capital market approach

Reilly F. and Brown K. (2000), Investment Analysis and Portfolio Management, 6th edition

Hersh Sefrin (2000), Beyond Greed and Fear: understanding behavioural finance and the psychology of investing

Nofsinger John R. (2002), The Psychology of Investing 1st edition

Stowe, Robinson, Pinto and McLeavey (2002), Analysis of Equity Investments: Valuation AIMR

Krishna G. Palepu, Paul M. Healy, and Victor L. Bernard (2000) Business Analysis and Valuation using Financial Statements, 2nd edition, South-Western College Publishing

	James R. English (2001), Applied Equity Analysis: Stock Valuation Techniques for Wall Street Professionals, McGraw-Hill, New York **Supplementary:** Graham and Dodd (1962), Security Analysis: principles and technique, 4th edition Graham (1973), The Intelligent Investor: a book of practical counsel Michael E. Porter (1998), Competitive Strategy: The Core Concepts, Free Press, New York Howard Schilit (2002), Financial Shenanigans, 2nd edition, McGraw-Hill, New York Robert J. Shiller (2000), Irrational Exuberance, Broadway Books, New York

Subject Description Form

Subject Code	BRE4281
Subject Title	Construction Engineering Management
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	Pre-requisite: BRE350 – Project Management and Procurement Co-requisite / Exclusion: Nil
Objectives	This subject is intended to develop the students' ability to apply decision making theories and operational research techniques in the management of construction projects.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. identify and diagnose management problems accurately and effectively across a wide range of construction engineering activities, including management practices, human resources and plant management, operations, and strategic management. b. formulate construction engineering management problems into analytical models. c. find out and plan sound solutions from various analytical models by using quantitative (operational research) techniques.
Subject Synopsis/ Indicative Syllabus	Construction productivity measurement and analysis Site management and method statements Fast track construction systems Construction plant and materials management Risk management for construction projects Construction management practices in Mainland China Linear and dynamic programming techniques and applications Decision theory and applications Inventory control theory and applications Monte Carlo simulation and applications
Teaching/Learning Methodology	Student learning will be facilitated through a combination of self-study and class contact sessions. The self-study will include guided reading, library searching skills, problem solving, reflection and textual & graphical communication as individuals and as part of a group. Some assignments will involve the training and development of problem analysis and presentation of results. Class contact will include lectures for providing an overall framework to topic areas and for those areas where textbooks do not provide adequate coverage. Small group sessions will be used for a combination of student-led seminars, role plays and workshop exercises for skill development and the raising of ethical awareness.

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. Continuous assessment	50%	√	√	√			
2. Examination (2 hours)	50%	√	√	√			
Total	100 %						

The subject will be assessed on both a continuous basis and a close-book written examination. Coursework and examination will constitute equal parts of the overall marks of the subject respectively. The coursework mark will be based on role play, seminar discussion, presentation, workshops and problem-based assignments. Marks will be allocated on group and individual basis.

The individual problem-based assignments and group assignment presentations attempt to test the level of students' knowledge and application of various decision making theories and operational research techniques to construction projects, and then to determine the best option or the most optimal solution for implementation with strong justifications or sound recommendations.

Typical coursework assessment criteria include:

- logical structure;
- clarity and depth of thought;
- quality of written presentation;
- knowledge and information;
- problem analysis skills;
- oral and visual presentation skills;
- participation and leadership.

The exam questions attempt to test students' knowledge and understanding of various decision making theories and operational research techniques to construction projects, and then to suggest the most desirable strategies with justified arguments.

Student Study Effort Expected

Class contact:	
▪ Lectures	21 Hrs.
▪ Tutorials / Seminars	21 Hrs.
Other student study effort:	
▪ Self learning and recommended reading	120 Hrs.
▪	Hrs.
Total student study effort	162 Hrs.

Reading List and References

Recommended:

Chan D.W.M. and Kumaraswamy M.M. (1995) "A Study of the Factors Affecting

Construction Durations in Hong Kong". *Construction Management and Economics*, 13(4), July, 319-333.

Chan D.W.M. and Kumaraswamy M.M. (1995) "Effects of Technology and Site Productivity on Construction Times of Building Projects in Hong Kong". *Proceedings of the 16th Annual ASEM Conference*, American Society for Engineering Management, 21-23 September 1995, Washington DC, USA, 309-316.

Dai J.K., Goodrum P.M. and Maloney W.F. (2007) "Analysis of Craft Workers' and Foremen's Perceptions of the Factors Affecting Construction Labour Productivity". *Construction Management and Economics*, 25(11), November, 1137-1150.

Harris F. and McCaffer R. (2001) *Modern Construction Managemen*t, 5th Edition, Blackwell Science: Oxford

Kumaraswamy M.M. and Chan D.W.M. (1995) "Determinants of Construction Duration". *Construction Management and Economics*, 13(3), May, 209-217.

Olomolaiye P.O., Jayawardane A.K.W. and Harris F.C. (1998) *Construction Productivity Management*, Addison Wesley Longman, Edinburgh, England: Chartered Institute of Building.

Render Barry (1997) Quantitative Analysis for Management. Upper Saddle River, N.J.: Prentice Hall, 6th Edition, Longman Ltd., Ascot, England: Chartered Institute of Building

Shen L.Y., Lu W.S., Li H. and Shen Q.P. (2003) "Computer-aided decision support system for assessing contractor's competitiveness", *Journal of Automation in Construction* Vol. 12, No.5, 577-587.

Shen L.Y., Li Q.M. and Li H. (2002) 'Alternative concession model for BOT-contract project', *Journal of Construction Engineering and Management, ASCE*, 128(4), 326-331.

Shen L.Y, Wu M. and Wang J.Y. (2002) 'A model for assessing the feasibility of construction project in contributing to the attainment of sustainable development', *Journal of Construction Research*, Vol. 3, No.2, 255-271.

Shen L.Y., Wu W.C., Ng S.K. (2001) 'Risk Analysis for Construction Joint Ventures in China' *Journal of Construction Engineering and Management, ASCE*, 127(1), 76-82.

Shen L.Y., Drew D., Zhang Z.H. (1999) 'An Optimal Bidding Model for Price-Time Bi-parameter Construction Contracts' *Journal of Construction Engineering and Management, ASCE*, Vol. 125, No.3, pp.204-209.

Fisher N. and Shen L.Y. (1992) *Information Management within a Contractor - a Model for the Flow of Data* Thomas Telford Publications, U.K., ISBN 0-7277-1666-2 (This book is based on the research studies 'information management system for construction companies'), pp.260.

Shen L.Y. (1999) 'Risk Management', *Building in Value: Pre-design Issues*, (Ed., Best & De Valence) Arnold Publishers, ISBN: 0340741600, pp.248-267.

Tang S.L., Ahmad I.U., Ahmed S.M. and Lu M (2004) *Quantitative Techniques for Decision Making in Construction*, Hong Kong University Press: Hong Kong.

	Journals: *Hong Kong Engineer: The Journal of The Hong Kong Institution of Engineers*, Printers' Circle Ltd *Journal of Building and Construction Management*, CIOB(HK), HKIE (Building Division) and ACMA *Australian Institute of Building Papers*, AIB *Construction Management and Economics*, Routledge, Taylor & Francis *Engineering, Construction and Architectural Management*, Emerald *Facilities*, Emerald *HKIE Transactions*, Henderson & Associates *Journal of Construction Engineering and Management*, ASCE *Journal of Facilities Management*, Emerald *Journal of Management in Engineering*, ASCE *International Journal of Construction Management* *International Journal of Project Management*, Elsevier *Building and Environment*, Elsevier *Building Research and Information*, Routledge, Taylor & Francis

Subject Description Form

Subject Code	BRE4291
Subject Title	Real Estate Marketing
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	This subject is intended to equip with students: a) Ability to examine and apply marketing theories in the real estate industry, and b) Capability to comprehend practices and regulations in relation to real estate marketing.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a) Apply marketing theory in the real estate industry; b) Understand key literature pertaining to the field of study; c) Evaluate the practices and marketing strategies in both primary and secondary markets; d) Comprehend the impacts to the industry by the introduction of regulatory controls.
Subject Synopsis/ Indicative Syllabus	1. Introduction and simple marketing concepts 2. Marketing theory and applications in the real estate market a) Target Marketing and Market Segmentation b) Product Strategies c) Pricing Strategies d) Placing Strategies e) Promotion Strategies 3. Salient elements of the regulatory controls a) Estate Agents Ordinance b) Estate Agents Authority c) Licensing d) Practice regulations e) Code of conducts 4. Other topics include applications of game theory in real estate marketing, estate agency industry in China etc.
Teaching/Learning Methodology	This subject adopts Criterion-Referenced Assessment (CRA). Format of assessment: ◦ Coursework (50%) • In-class assessment - comprehension of key literature • Identifications of Salient Product features • Preparation of Marketing Plan ◦ Examination (50%) • 2-hr exam essay type questions

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.In-class assessment	15		√				
2. Product features	15			√			
3. Marketing Plan	30	√		√	√		
4. Examination	50	√	√	√	√		
Total	100 %						

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

The students will assure the instructors of their timely comprehensions of the key literature through the weekly in-class assessments. The design of the coursework will emphasize on testing the students' understandings on the applications of marketing theory and regulatory controls in the industry. Rooms are also allowed for the students to demonstrate their critical thinking ability and creativity in the coursework. All the intended learning outcomes will be evaluated in the final examination.

Student Study Effort Expected

Class contact:	
▪ Lectures	21 Hrs.
▪ Tutorials	21 Hrs.
Other student study effort:	
▪ Reading	42 Hrs.
▪ Coursework	36 Hrs.
Total student study effort	120 Hrs.

Reading List and References

Armstrong, G and P. Kolter. 2008. *Marketing: An introduction* (9th ed.) Prentice Hall.

Choy, H.T. 1998. Real Estate Marketing. In Real Estate Development ed. Poon and Chan, PACE

Estate Agency Ordinance Cap.511, Laws of Hong Kong.

Bajtelsmit, Vickie and Elaine Worzala. 1997. Adversarial brokerage in residential real estate transactions: The impact of separate buyer representation. Journal of Real Estate Research. 14(1/2):65-75.

Worzala E. et. al. 2002. E-commerce and retail property in the UK and USA. *Journal of property investment and finance*. 20(2):142-58.

	Raftery, J. and G. Runeson. 1997. Money illusion in consumer perception of housing transactions. Journal of Property Valuation & Investion. 16(2): 175-84. Tang, B.S., S.W. Wong and S.C. Liu. 2006. Property agents, housing markets and housing services in transitional urban China. Housing Studies. 21(6):801-25. Estate Agents Authority website (standard forms, code of ethics and practice circulars etc.) Choy, Lennon and Edwin Chan. 2002. Extending Estate Agents Ordinance to non-domestic properties. Working paper series. Department of Building and Real Estate, The Hong Kong Polytechnic University.

Subject Description Form

Subject Code	BRE435
Subject Title	Design, Adaptation and Conversion
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	BRE391
Objectives	To equip students with the skills necessary to undertake the conversion to existing buildings.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: 1. Identify problems and constraints in the course of design for conversion and adaptation work. 2. Apply the knowledge and techniques to extend the useful life and economic return of Hong Kong buildings by means of conversion and adaptation. 3. Understand the concepts of economic and physical obsolescence for buildings for evaluation of their impacts on process of conversion work. 4. Comply with the local statutory requirements in the course of adaptation and conversion to existing buildings. 5. Use the project management and contract administration techniques for conversion and adaptation practice.
Subject Synopsis/ Indicative Syllabus	1. The design and structural considerations and implications that affect the conversion, improvement and adaptation work on existing buildings in relation to users requirements. 2. The physical and economical considerations that determine the viability and feasibility of conversion or adaptation of existing buildings. 3. Relevant legislation controlling the conversion and adaptation work of existing buildings including those of architectural and historical nature. 4. The special considerations of planning the project management and contract administration for conversion and adaptation work. 5. Special considerations for the conversion and adaptation work of buildings of architectural and historical interest.
Teaching/Learning Methodology	The subject involves both theoretical and practical approaches in local context relating to project work and tutorial assignments, such as lectures, seminars, case studies, site visits, criticism of presentations and projects by peer groups and practicing professionals and etc. Some of them will be delivered by prominent professional practitioners.

Assessment Methods in Alignment with Intended Learning Outcomes

The focus of assessment is on the practical skills associated with solving the problems of adapting buildings by integrating the key learning outcomes and will therefore use case studies. The subject will be assessed by 2 pieces of coursework including project work and tutorial assignments. One will be on project basis (70% of coursework) and the other will be on written assignment (30% of coursework).

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)						
		a	b	c	d	e	f	g
1. Project work	35	√	√	√	√	√	√	√
2. Continuous assessment	15	√	√	√		√		√
3. Examination	50			√		√	√	√
Total	100 %							

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

(a) Appropriate report structure.
(b) Participation and contribution.
(c) Relevant focus and depth.
(d) Analysis, synthesis and technical competence of design and construction.
(e) Logic of explanation.
(f) Relevance and clarity of sketches and drawings.
(g) Communication skills

Student Study Effort Expected

Class contact:	
▪ Lecture	21 Hrs.
▪ Tutorial	21 Hrs.
Other student study effort:	
▪ Project work	80 Hrs.
▪ Project and seminar topic preparation	40 Hrs.
Total student study effort	162 Hrs.

Reading List and References

Hong Kong Government, *Building (Planning) Regulations, latest Edition*, Government Printer.

Catt, R. & Catt, S. (1981) *Conversion, Improvement and Extension of Buildings*, London: Estate Gazette.

Markus, Thomas A, (1979), *Building Conversion and Rehabilitation: Designing for Change in Building Use*, London: Butterworths.

Highfield, David (1987), *Rehabilitation and Re-use of Old Buildings*, Spon.

Cantacuzino, Sherban, (1975), *New Uses for Old Buildings*, Architectural Press.

Subject Description Form

Subject Code	BRE436
Subject Title	Applied Property Valuation
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	BRE315
Objectives	1. To stimulate the students in tackling practical valuation issues. 2. To enhance the abilities of the students in the interpretation of relevant legislations and guidelines that related to property valuation. 3. To analyze valuation standards of selected overseas countries.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Explore the effects of land administrative measures and land tenure on property value. b. Apply current legislative measures which affect property value and valuation approaches in resumption, modification and taxation cases. c. Apply the techniques of valuation to appraise, analyze and solve complex valuation problems in both private and public sectors. d. Explore the sources of international valuation standards and their importance. e. Possess knowledge of contemporary issues.
Subject Synopsis/ Indicative Syllabus	Land administrative measures and land tenure in Hong Kong. Valuation of development land. Valuation for lease modification and lease exchange Valuation for resumption purposes. Valuation for taxation purposes Asset Valuation
Teaching/Learning Methodology	This subject is aimed at developing the students' ability to appraise and solve advanced statutory valuation problems. Lectures will be used to highlight the various valuation approaches and the current statutory provisions affecting development and value of property. Case studies will be employed as illustrations, wherever possible. Tutorials will be used by the lecturer and students to discuss valuation problems while seminars provide suitable forums for presentation by the students. Senior professionals may also be invited f to give talks on specific valuation topics and share their experience with the students.

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. Examinations	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 1 term paper and 2 problem solving assignments in the form of quiz.

Both examination and coursework assess learning outcome a to e.

Student Study Effort Expected

Class contact:	
▪ Lectures	21 Hrs.
▪ Tutorials	21 Hrs.
Other student study effort:	
▪ Self-studies	120 Hrs.
▪	Hrs.
Total student study effort	162 Hrs.

Reading List and References

Reading List:

Recommended:

Cruden, G.N., (2009) *Land Compensation and Valuation Law in Hong Kong*, Butterworths

HKIS, (1999) *Hong Kong Guidance Notes on the Valuation of Assets*

Baum, A., & Sams, G., (1997) *Statutory Valuations*, Routledge

Butler, D. & Richmond, D., (1990) *Advanced Valuation*, MacMillan

Poon, N.T., & Chan, H.W., (1998) *Real Estate Development in Hong Kong*, PACE

Supplementary:

Nissim, R., (2008) Land Administration & Practice in Hong Kong, HKU Press

	Rees, W.H. (ed), (1992) *Valuation: Principles into Practice*, Estates Gazette Hong Kong SAR Government: Building Ordinance (Cap 123) Land (Miscellaneous Provisions) Ordinance (Cap 28) Land Resumption Ordinance (Cap 124) Government Leases Ordinance (Cap 40) Government Rights (Re-entry and Vesting Remedies) Ordinance (Cap 126) Estate Duty Ordinance (Cap 111) Hong Kong Airport (Control of Obstruction) Ordinance (Cap 301) Landlord and Tenant (Consolidation) Ordinance (Cap 7) Lands Tribunal Ordinance (Cap 17) Mass Transit Railway (Land Resumption and Related Provisions) Ordinance (Cap 276) Rating Ordinance (Cap 116) Stamp Duty Ordinance (Cap 117) Roads (Works, Use and Compensation) Ordinance (Cap 370) Railways Ordinance (Cap 519) Land (Compulsory Sale For Redevelopment) Ordinance (Cap 545)

Subject Description Form

Subject Code	BRE437
Subject Title	Facilities Management
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	Introducing the concept of facilities management and its application in various organizations. The development of facility management, the challenges and opportunities for facility manager will be examined. Contemporary issues in benchmarking, facility audit, building performance assessment, corporate real estate portfolio management and finance will also be discussed.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Articulate management concepts within a variety of facility contexts. b. Assess the performance of a real estate facility across a wide range of performance criteria. c. Evaluate of real estate performance decision.. d. Analyse the role of a facility manager, and apply key competences of a manager on problem solving and decision making.
Subject Synopsis/ Indicative Syllabus	Basic concepts of facility management – an integrated approach The changing workplace – space utilization and intelligent buildings requirements Growth of facility management in Hong Kong – portfolios and institutions Facility audit and building performance assessment – criteria of assessment, HK-BEAM, IBI, etc. Information & knowledge management for facility management- its importance Intelligent Building- the development Sustainable facility management- optimizing financial, environmental & social factors Outsourcing – cost and benefit analysis, basic concepts of outsourcing Corporate real estate portfolio management – evaluation of real estate performance, decision of acquisition to dis-investment, asset management, real options approach.

Teaching/Learning Methodology

Topics will be introduced by lectures with guidance to various reference materials. Case studies and assignments will be used to create an 'action learning' environment in which the students will critically evaluate practices and procedures for the achievement of quality. Small group discussion will enhance the information flow and evaluation process.

- Lectures and seminars
- In-class tutorials
- Independent study
  - Assignment
  - Self-study

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.Assignment 1	20%	√	√		√		
2. Case study + presentation	30%	√		√	√		
3. Examination	50%	√	√		√		
Total	100 %						

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

Assignment (20%) and case study with presentation (30%) assess the students' ability to apply the theoretical concepts. Presentation assesses the students' ability to communicate their ideas and project.

Examination (50%) tests the students' ability to articulate the relationships through discussions and arguments, whilst application is tested via scenario-based questions.

Student Study Effort Expected

Class contact:	
▪ Lectures / tutorials	42 Hrs.
▪	Hrs.
Other student study effort:	
▪ Coursework assignment	24 Hrs.
▪ Independent self-study	100Hrs.
Total student study effort	166 Hrs.

Reading List and References	**Recommended:** Alexander, K. (1996). Facilities Management: A Strategic Framework, in Alexander, K. (ed). *Facilities Management: Theory and Practice*, E&FN Spon, UK, 2-13 Becker, F. and Sims, W. (1990). Assessing Building Performance, in Becker, F.D. (ed). *The Total Workplace: Facilities Management and the Elastic Organization*, Van Nostrand Reinhold, NY, 261-270 Duffy, F. (1992). *The Changing Workplace*, Phaidon Finch, E. (1996). A Sea-change in Facilities Management, in Alexander, K. (ed). *Facilities Management: Theory and Practice*, E&FN Spon, UK. Hamer, J. (1988). *Facility Management Systems*, Van Nostrand Reinhold HK-BEAM (1996a), *An Environmental Assessment for New Air-conditioned Office Premises*, Version 1/96, Centre of Environmental Technology, Hong Kong. HK-BEAM (1996b), *An Environmental Assessment for New Air-conditioned Office Premises*, Version 2/96, Centre of Environmental Technology, Hong Kong. HK-BEAM (1999), *An Environmental Assessment for New Residential Buildings*, Version 3/99, Centre of Environmental Technology, Hong Kong. IFMA (1997), Benchmark III, International Facility Management Association, Houston, Tex. IFMA, (1984). *IFMA Research Report #1*, IFMA, Houston IFMA, (1987). *Facilities Benchmarks*, IFMA, Houston IFMA, (1999). Outlook on Outsourcing, IFMA, Houston **Supplementary:** Chau, K.W., Leung, A.Y.T., Yiu, C.Y. and Wong, S.K. (2003). "Estimating the value enhancement effects of refurbishment" (2003), *Facilities*, **21**(1/2), p.13-19. *Li, L.H. and Siu, A. (2001) "Privatising management services in subsidized housing in Hong Kong",* Property Management*, 19(1), 37-49.* Preiser, W.F.E., Rabinowitz, Z. and White, E. (1988). *Post-occupancy Evaluation*, Van Nostrand Reinhold, NY So, A.T.P. and Wong, K.C. (2002), "On the quantitative assessment of intelligent buildings", *Facilities*, **20**(5/6), 208-16. Spedding, A. and Holmes, R. (1994). Facilities Management, in Spedding, A. (ed), *CIOB Handbook of Facilities Management*, Longman, 1-8. Teicholz, E. ed. (2000). *Facility Design and Management Handbook*, McGraw-Hill, NY. Vijverberg, G., (2002), Accommodation Functionality Assessment in Office Buildings, *Facilities,* **20**(3/4), 94-103.

	Worthing, D. (1994). Strategic Property Management, in Spedding, A. (ed), *CIOB Handbook of Facilities Management*, Longman, 9-24. **Journals for references:** *Facilities* *Facility Management Journal* *IFMA News* *Property Management*

Subject Description Form

Subject Code	BRE439
Subject Title	Engineering Contract Procedure
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	Develop an understanding of the technological, practical, procedural, contractual and economic characteristics of engineering work including building services in building projects and civil engineering work.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Possess the knowledge of the technological practices of engineering work. b. Understand the practices of procurement and contractual arrangements of engineering work. c. Produce and evaluate the measurement and documentation of engineering work. d. Appraise and apply the principle and practices of contractual procedures and administration in engineering work. e. Communicate effectively with contractual negotiation skills.
Subject Synopsis/ Indicative Syllabus	1. Technological aspects of building services work and civil engineering work. 2. Cost appraisal and cost planning for building services and civil engineering projects. 3. Procurement systems and contractual arrangements for building services and civil engineering projects. 4. Documentation, measurement and valuation of building services and civil engineering work. 5. Contract administration and procedure in building services and civil engineering projects.
Teaching/Learning Methodology	Contract documentation and administration will form the main thrust of the course, to be underpinned on a comprehensive engineering work technologies and practices. Interactive lectures on the various technologies, practice and economic aspects will be conducted with a view of providing the background knowledge necessary for developing competence in documentation, procurement and administration in the field of engineering work. Interactive lecture and case studies will be utilized. Professional practitioners will be invited to facilitate problem based learning on different contract strategies in different projects. Tutorial sections will be provided to conduct systematic in discussions.

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.Course Work	50%	√	√	√	√	√	
2. Examination	50%	√	√	√	√	√	
Total	100 %						

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

Examination and coursework will constitute the 50% and 50% of the overall mark for the subject respectively. The coursework mark will be based on the assignments by producing documentation, seminar presentations and discussions. At least two assignments with equal contribution will be set.

The assessment by examination will be based on a 2 hour examination. The coursework will be evaluated on; (i) a basic understanding of engineering work practices, economics of engineering work development, and its impact on the economy; (ii) a working knowledge of the contract documentation and administration of typical engineering work; (iii) a critical appraisal of alternative contract strategies, procedures and administration in engineering work.

Student Study Effort Expected

Class contact:	
▪ Lecture	21 Hrs.
▪ Tutorial / Seminar	21 Hrs.
Other student study effort:	
▪ Self learning and recommended reading	120 Hrs.
▪	Hrs.
Total student study effort	162 Hrs.

Reading List and References

Recommended:

Wong K.D. (2008) *Target Cost Contracting in Hong Kong* – Chapter 12 of the book by PACE Publishing Ltd, namely "*Contractual and Regulatory Innovations in Building and Real Estate*" edited by Edwin Chan and Edward Yiu, Page 69 to 74, June 2008.

Wong K.D. (1998) "*Real Estate Development in Hong Kong*" Chapter 12 *Procurement & Tendering* and Chapter 13 *Contractual Arrangement and Construction Management*, a book by PACE Publishing Limited 1998 ISBN 962-7723-09-6.

HKIA/HKIS Standard Form of Building Contract 2005 Edition.

	HKSAR Government General Conditions of Contract for Civil Engineering Works 1999 Editions HKSAR Government General Conditions of Contract for Electrical and Mechanical Engineering Works 1999 Editions HKSAR Government General Conditions of Contract for Design and Build Contracts 1999 Editions Ashworth, A (1994) *Cost Studies of Buildings,* Harlow: Longman Scientific & Technical. HKSMM4 (2005) *Hong Kong Standard Method of Measurement for Building Services*. Mayo-Chandler, Bryan (1980) *Estimating for the Engineering Services*, London: The Electrical Contractors Association. Seeley, Ivor H (1984) *Building Economics: Appraisal & Control of Building Design*, London: Macmillan. Atkinson, A.V., (1985) *Engineering Contract Administration*, Hutchinson Barnes, M., (Editor)(1990), *Financial Control*, Thomas Telford Cooper, D.F., (1987) *Risk Analysis for Large Projects*, Wiley **Supplementary:** Grounds, J. (1991) Effective Engineering Services Cost Management. *The Building Economist* **23**(June),20-21. Kinlay & Bayley (1985) Quantity surveyors in engineering projects. *The Building Economist* **24** (2), 2-3. Mills, Anthony (1991) The value of cost planning and bills of quantities. *The Building Economist* **24**(1),14-17. Ott, A.J. (1989) Quantity surveyors in specialist services. *The Building Economist* **28** (1), 18-19. Redding, J. (1987) Building services and the challenge of bills of Quantities.*The Building Economist* **25**(4)9-10. Balke, L., (1989) *Civil Engineer's Reference Book*, Butterworths Bunni, N.G., (1991) *The FIDIC Form of Contract, the fourth edition of the red book*, BSP Professional. Government of Hong Kong, (1988) *SMM for Civil Engineering Works*, Hong Kong Government Printer Government of Hong Kong, (1988) *Sub-contract Articles of Agreement and Conditions for Civil Engineering Works*, Hong Kong Government Printer ICE *Civil Engineering Standard Method of Measurement 3* Third Edition, Thomas Telford, London 1991

	ICE *Civil Engineering Standard Method of Measurement 3* Examples Wong and Tse (1998) "*A Study of Quantity Surveying Practices in the Building Services Sector of Hong Kong*" Asia Pacific Building and Construction Management Journal, Page 9 - Page 15 Volume Four December 1998 ISSN 1024-9540. Wong K.D. (2006) **"***The application of a computerized financial control system for the decision support of target cost contracts***"**, ITcon Vol. 11, Special Issue Decision Support Systems for Infrastructure Management , Page. 257-268, http://www.itcon.org/2006/19 Wong A K D (2006)

Subject Description Form

Subject Code	BRE440
Subject Title	Cost and Value Management
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	BRE347 or equivalent
Objectives	*This subject is intended to:* • Focus on both theories and applications of value management in different phases of a development, • Develop an appreciation for what can be accomplished using the techniques of VM and applied creativity, and • Identify management and technical issues that can be solved or addressed using the techniques of VM and critical thinking.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Comprehend and identify issue and problems concerning land, property and construction at project level b. Comprehend and identify issue and problems concerning land, property and construction at corporate level c. Formulate and implement strategies, policies and solutions for sustainable development and construction d. Possess skills to identify, analyse and solve problems e. Communicate effectively
Subject Synopsis/ Indicative Syllabus	Notion of value: value, function and cost. Value management basics: historical development; project selection (types, values, and timing); alternative workshop approaches (e.g. the 40-hour job plan, the Charette, the VM audit, and the contractor's change proposal). Value management methodology: - VM job plan (information, analysis, creativity, evaluation, development, proposal); function analysis, group dynamics, creativity, and problem-solving skills Life cycle costing for construction projects Comparison of value management and traditional cost management techniques. Case studies of the practice of value management in Hong Kong and overseas.
Teaching/Learning Methodology	▪ Interactive lectures with discussions and Q&A to test students understanding before starting a new topic ▪ Use of videos to introduce concepts and pose discussions during tutorials ▪ Quiz to test students understand on this subject ▪ Small team projects to simulate real-life work settings ▪ Sharing and discussions in tutorials ▪ Use workshop settings to facilitate students understanding of value management concepts ▪ Introduce both local and overseas real-life case studies to facilitate understanding and appreciation of real-life practices

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	
Small team project	25%	√	√	√	√	√	
Quiz	25%	√	√		√		
Examination	50%	√	√	√	√	√	
Total	100 %						

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

The team project brief resembled real-life scenario but modified to suite students' level. The project asked the students to design and facilitate a value management workshop for a project and they also need to bid for the project from the perspective of a professional service firm. Finally, students were asked to identify, analyse and solve problems that they encountered in that particular project. Since they are acting as professional advisor for the client/owner, they need to possess skills that they can communicate effectively to their client. At the conclusion of this subject, all students had achieved the intended subject learning outcomes assessed through the quiz, team project and examinations.

Student Study Effort Expected

Class contact:	
▪ Lectures	21 Hrs.
▪ Seminars	21 Hrs.
Other student study effort:	
▪ Self study materials	20 Hrs.
▪ Assignments/Quiz Preparation	58 Hrs.
Total student study effort	120 Hrs.

Reading List and References

Akiyama, K. (1991), *Function Analysis: Systematic Improvement of Quality and Performance*, Productivity Press.

Ashworth, A. (2010), *Cost Studies of Buildings*, Pearson.

Connaughton, J.N. (1996), *Value Management in Construction: A Client's Guide*, Construction Industry Research and Information Association.

Dell'Isola, A.J. (1997), *Value Engineering: Practical Applications - for Design, Construction, Maintenance & Operations*, R.S. Means Company.

Fong, P.S.W. et al (1998), *Applications of Value Management in the Construction Industry in Hong Kong*, Dept. of Building & Real Estate, The Hong Kong Polytechnic University.

Fowler, T.C. (1990), *Value Analysis in Design*, Van Nostrand Reinhold.

	Hayden, G.W. (1996), *Value Engineering of Building Services*, Building Services Research and Information Association. Institution of Civil Engineers (1996), *Creating Value in Engineering*, Thomas Telford. Kelly, J. and Male, S. (1993), *Value Management in Design and Construction: The Economic Management of Projects*, E & F N Spon. Kirk, S. J. and Dell'Isola, A. J. (1995), ***Life** Cycle Costing for Design Professionals*, McGraw-Hill. Norton, B.R. (1995), *Value Management in Construction: A Practical Guide*, Macmillan. Palmer, A. (1992), *A Comparison of US Value Engineering with British Cost Control Procedures*, Value and the Client, Surveyors Publications. Park, R.J. (1999), *Value Engineering: A Plan for Invention*, St. Lucie Press. Shen Q.P. and Liu G.W. (2003) Critical success factors for value management studies in construction, *Journal of Construction Engineering and Management*, *American Society of Civil Engineers (ASCE)*, 129(5), 485-491. *Various materials provided in the designated e-learning management system.*

Subject Description Form

Subject Code	BRE441
Subject Title	Professional Studies
Credit Value	5
Level	4
Pre-requisite / Co-requisite/ Exclusion	BRE346
Objectives	To encourage critical investigation, analysis and synthesis in solving problems in the surveying professional context. To provide an environment for the student to develop skills in identifying and solving problems and allows the integration of knowledge gained in separate subject areas. To promote the students' understanding of interdisciplinary nature of the development process and develops team working.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: 1. Understand the major issues involved in the development process for application and compliance. 2. Appropriate the value of teamwork as an approach to tackle a project and problem-solving. 3. Integrate knowledge and skills acquired in various subject areas and to solve problems in the surveying professional context.
Subject Synopsis/ Indicative Syllabus	A series of property related project scenarios 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 projects will require the students to make use of and integrate knowledge learnt from previous and current subject modules. Each project will include an element of group and individual work gears towards surveying professional disciplines. The projects require students to develop solutions creatively and to present recommendations systematically.
Teaching/Learning Methodology	The projects will provide a student centered problem-based learning approach in a professional or industrial setting. The projects will be delivered by supervisors together with visiting lecturers who are practicing professionals in the fields, with overall co-ordination by one member of staff to ensure continuity and relevance of project subject matter. Project material will be coordinated at the start of each academic year to ensure quality and consistency of the project information given to the students. Supervision and consultation will be made available throughout the entire semester period.

Assessment Methods in Alignment with Intended Learning Outcomes

The subject will be assessed based on coursework only. Students have to produce two written reports (Interim Report and Final Report) covering written text, diagrams/ drawings, photographs, design calculations, tables and charts necessary for explanation and illustration wherever appropriate. Also, supervisors will be assigned for each group, and in regular interval, they will be asked to report to their supervisors on the progress of work. Both aggregating grades and assigning grades are given to group effort and individual contribution in a group. This is to ensure that each student has his/her contribution to the project.

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c	d	e	f
1. Project work	80	√	√	√	√	√	√
2. Continuous assessment	20	√		√	√		√
Total	100 %						

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

(a) Appropriate report structure.
(b) Relevant focus and depth.
(c) Analysis, synthesis and technical competence of construction methods.
(d) Logic of explanation.
(e) Relevance and clarity of sketches.
(f) Communication linkage amongst different stakeholders.

Student Study Effort Expected

Class contact:		
▪ Supervision and consultation	28	Hrs.
▪ Project discussion and evaluation	126	Hrs.
Other student study effort:		
▪ Project work	140	Hrs.
▪ Background study and outline planning	60	Hrs.
Total student study effort	354	Hrs.

Reading List and References

Construction Journals, Databases, Statistics and Subject Module Texts

Subject Description Form

Subject Code	BRE442
Subject Title	Forecasting & Competition in the Built Environment
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	BRE345
Objectives	This subject intended to help students acquire knowledge and skills to forecast and compete for work in the built environment.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: 1. Select and employ appropriate techniques in price forecasting and strategies for improving survival and profitability. 2. Recognise the usefulness and limitations of competition and forecasting models. 3. Integrate risk management techniques with competition and forecasting models. 4. Analyse competitive performance and forecasting accuracy. 5. Draw conclusions and make recommendations on improving competitive performance and forecasting accuracy.
Subject Synopsis/ Indicative Syllabus	*Competition* • Auction theory: relationship between construction contract bidding, competitive fee bidding and land auctions. • Strategic management and competitive advantage: diversification; international contracting. • The competitive environment competition processes: level of competition; market conditions: survival and profitability; competitor analysis, decision to compete; pricing policy; competition strategy; risk in competing. • Monitoring competition performance: competitiveness and consistency in competing for construction contracts; market share and competitiveness. • Strategies for improving competitive advantage; subcontractor selection strategies. • Client objectives: negotiation; competitor prequalification, competition assessment, and award of contract. • Strategies for improving competitor prequalification. *Forecasting* • Relationship between competition, bidding and forecasting • Designers' and contractors' approaches to forecasting; resume of forecasting techniques; deterministic and nondeterministic approaches to forecasting; risk in forecasting.

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

- Accuracy and reliability of forecasts: factors affecting accuracy of forecasts; feedback in forecasting.

</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Lectures introduce the concepts and approaches in practice followed by discussion on background reading and forecasting and/or bidding tasks in the tutorials. In the tutorials, the students will be required to produce a forecast and/or bid price, justifying how they arrived at the forecast/bid price.</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</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td></td></tr>
<tr><td>Tutorial tasks</td><td>40%</td><td>√</td><td></td><td></td><td>√</td><td>√</td><td></td></tr>
<tr><td>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="5"></td></tr>
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<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lectures</td><td>21 Hrs.</td></tr>
<tr><td>▪ Tutorials</td><td>21 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Student effort hours</td><td>120 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>162 Hrs.</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>

Indicative Reading List:

Ashworth A. (1994) *Cost Studies of Buildings*, Longman; Harlow

Brook M. (2004) *Estimating and Tendering for Construction Work*, Butterworth Heineman, Oxford

Cartlidge D. (2004) *Procurement of Built Assets*, Elsevier Oxford

Ferry D. and Brandon P.S. (1999) *Cost Planning of Buildings*, Blackwell Science, Oxford

Park W.R. & Chapin W.B. (1992) *Construction Bidding: Pricing for Profit.* John Wiley & Sons, New York

Seeley I. (1996) *Building Economics*, Macmillan, Basingstoke

Walker I. and Wilkie R. (2002*) Commercial Management in Construction*, Blackwell Oxford

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Subject Description Form

Subject Code	BRE450
Subject Title	Building Maintenance for Sustainability
Credit Value	3
Level	4
Pre-requisite / **Co-requisite/** **Exclusion**	BRE212 (preferably) or BRE391 or equivalent/ Nil/ BRE326
Objectives	1. equip students with the practical knowledge and skills in their future roles as building construction and maintenance professionals 2. provide students an understanding and appreciation of sustainable construction/building 3. provide students an understanding that sustainability can be achieved by not only constructing sustainable new buildings but also by effective maintenance and repair of existing buildings (i.e. by prolonging their service life through upholding/enhancing their integrity, safety, durability and hygiene). (This subject focuses on the aspects of building structures/elements/fabrics/materials and not building services systems that are installed inside.) 4. provide students an understanding that building energy-wise sustainability can be enhanced through appropriate retrofitting
Intended Learning Outcomes	Upon completion of the subject, students will be able to: Part A (Dr. Steven Tsang) a) understand that CM acts as a precursor for effective maintenance and repair b) Understand that RT and ST are effective repairs/remedies to building defects c) Understand the fundamental physical principles of and conduct advanced Condition Monitoring (CM), Rehabilitation Techniques (RT) and Strengthening Techniques (ST) on buildings and their fabrics (typical high-rise RC buildings) d) Acquire the practical skills in undertaking measurement, acquiring data in the aspects of building integrity, safety and energy performance (with occasional specialist technical support in the cases of some very sophisticated equipment) as well as in the applications of RT and ST e) conduct building pathology and defect diagnostics by interpreting appropriately data/charts/visual images obtained by the equipment with due regards paid to the strength, weakness and limitations of each technique f) enhance a building's energy-wise sustainability through retrofitting of advanced glass or films technologies as well as low-energy consuming lighting Part B (by another member of the teaching team or invited speakers) g) understand fundamental principles and various attributes of sustainability of the built environment in balancing economic, environmental and social objectives

	h) understand current legislations, regulations, assessment schemes relating to building sustainability in the aspects of repair and maintenance i) make informed selection of construction materials with the awareness of embodied energy and carbon contents of construction materials
Subject Synopsis/ Indicative Syllabus	**Need of sustainability** in global and local context - issues and impacts on environmental, economic and social sectors, Kyoto Protocol. **Principle of construction sustainability**: concepts and principles, roles and responsibilities of building professionals. **Strategy for sustainable construction**: • active measures: o design /construction stages: green building / materials, HKBEAM, BREEAM, LEED, BHHI o building in use : importance of building maintenance • passive measures: o legislations and regulations (e.g. on thermal, ventilation, electricity, etc.) o energy auditing and life cycle assessment o inspection for regular maintenance **Building maintenance for sustainability**: • choices of building materials - application, re-use and recycling; embodied energy and carbon contents of construction materials • rehabilitation • condition appraisal, building inspection - Mandatory Building Inspection Scheme in Hong Kong • different building defects diagnostic techniques and their applications and subsequent remedial maintenance work **Retrofitting using advanced materials and technologies:** • use advanced glazing (glass technologies) and solar-energy-reducing films • use advanced energy-reducing lighting • use repair/replacement materials with appropriate balance regarding embodied energy and carbon contents
Teaching/Learning Methodology	The subject covers theoretical, conceptual, statutory as well as practical issues in building maintenance for sustainability. Much of these will be taught in lectures and reinforced in tutorials and seminars. Laboratory classes and practical tests will cover the experimental and practical aspects. • Interactive lecture • A series of laboratory demonstrations • practical and workshop (guided) • hands-on experience as reinforcement of knowledge by undertaking Group Projects • Peer learning from other Groups during project Viva and presentation

Assessment Methods in Alignment with Intended Learning Outcomes

Assessed 100% by coursework and no written examination.

Part A:

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c	d	e	f
Group Project Report	40%	√	√	√	√	√	√
Viva	20%	√	√	√	√	√	√
individual reflective Journal on the group project	10%	√	√	√	√	√	√
Total	70%	(Each Group is expected to perform in the respective Group Projects on either 2 of the 3 areas of CM, RT, ST)					

Part B:

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		g	h	i			
class assignments/ class tests or quizzes	10%	√	√	√			
Seminar Paper/essay	20%	√	√	√			
Total	30%						

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

Student Study Effort Expected		
	Class contact:	
	▪ Lecture	21 Hrs.
	▪ TU/LAB/ FIELD TEST	10.5/ 4.5 /3.0 Hrs.
	▪ Viva and Presentation	3 Hrs.
	Other student study effort:	
	▪ Practical work	38 Hrs.
	▪ Self Study and reading	40 Hrs.
	Total student study effort	120 Hrs.

Reading List and References	**Sustainability of Construction:** CIB (1998), Sustainable development and the future of construction, *CIB report publication 225*, United States of America. Claude-Alain Roulet, Flourentzos Flourentzou, Flavio Foradini, Philomena Bluyssen, Chrit Cox, Claire Aizlewood (2006), Multicriteria analysis of health, comfort and energy efficiency in buildings, *Building Research & Information*, Volume 34, Issue 5 September 2006 , pages 475 – 482. Hill, R.C. and Bowen, P.A. (1997). Sustainable construction: principles and a framework for attainment, *Construction Management and Economics*, 1997(15), pp. 223-239. Raymond J. Cole, Shared markets: coexisting building environmental assessment methods, *Building Research & Information*, Volume 34, Issue 4 July 2006, pages 357 – 371. Shen, L. Y., Lu, W. S., Yao, H., and Wu, D. H. (2005b). 'An IT supported scoring method for measuring the environmental performance of construction activities', *Automation in Construction*, AIC Special Issue, 14 (2005), pp. 297-309. Sjostrom, C. and Bakens, W. (1999). Sustainable construction: Why, how, and what, *Building Research & Information*, Vol. 27(6), pp. 347-353. W.L. Lee, J. Burnett (2008), Benchmarking energy use assessment of HK-BEAM, BREEAM and LEED, *Building and Environment*, Volume 43, Issue 11, November 2008, Pages 1882-1891. Warren L. Paul, Peter A. Taylor (2008), A comparison of occupant comfort and satisfaction between a green building and a conventional building, *Building and Environment*, Pages 1858-1870. WCED (World Commission on Environment and Development), (1987). *Our common future*, Oxford University Press, 1-23. MOC (1999). *A guide to sustainable development construction in China*, Ministry of Construction, 27-30. **Sustainability of materials: Tables of Embodied Energy and Embodied Carbon Dioxide (ECO^2).** Cole, R.J. and Kernan, P.C. (1996), Life-Cycle Energy Use in Office Buildings, Building and Environment, Vol. 31, No. 4, pp. 307-317. Comparing the Environmental Effects of Building Systems, Wood the Renewable Resource Case Study No.4, Canadian Wood Council, Ottawa, 1997. The ECO2 figures for GEN 1, RC32/40 and RC40/50 were derived using industry agreed representative figures for cementitious materials, aggregates, reinforcement, admixtures and an appropriate figure for water. BRE Environmental Profiles database, Building Research Establishment (BRE), 2006

Building Diagnostic or Non-destructive Testing (NDT) Techniques:

HKCI: TM1 '*Test Method for Detection of Building Surface Defect by Infrared thermography*'. Published by the Hong Kong Institute of Concrete (HKCI), May 2009. (Inspection copy available at CARE)

HKCI: TM2 '*Test Method for Determination of Concrete Cover and Distribution of Steel rebar by Surface Penetration Radar'*. Published by the Hong Kong Institute of Concrete (HKCI), May 2009. (Inspection copy available at CARE).

Guide Book on Non-destructive Testing of Concrete Structures, Published by IAEA, Vienna, 2002, IAEA-TCS-17, ISBN-1018-6518.

Malhotra V. Mohan and Carino Nicholas J. Handbook of Non-destructive Testing of Concrete, CRC Press 2004, Print ISBN: 978-0-8493-1485-8, eBook ISBN: 978-1-4200-4005-0

Trade Catalogue of Equipment (Mostly available on the internet of the Manufacturer's web-site).

ACI 546R-04 - Concrete Repair Guide, Published by the American Concrete Institute.

ACI - Concrete Repair Manual Volume 1 and 2- 3rd Edition, Published by American Concrete Institute, ISBN:13-978-0-87031-262-5**.** (Inspection copy available at CARE).

Published papers on Building Diagnostic or Non-destructive Testing (NDT) Techniques:

LAI W.L., KOU S.C., POON C.S., TSANG W.F., LAI C.C. *"Effects of elevated water temperatures on interfacial delaminations, failure modes and shear strength in externally-bonded CFRP-concrete beams using infrared thermography, gray-scale images and direct shear test"*. CONSTRUCTION AND BUILDING MATERIALS, Vol. 23, No. 10, pp.3152-3160 (October 2009) (http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V2G-4WTRWJY-1&_user=217827&_origUdi=B6TWF)

LAI W.L., KOU S.C., POON C.S., TSANG W.F., LAI C.C *"Characterization of the deterioration of externally bonded CFRP-concrete composites using quantitative infrared thermography"*. CEMENT AND CONCRETE COMPOSITES, pp.999-9999 (2010) (http://www.sciencedirect.com/science?_ob=MImg&_imagekey=B6TWF-4YPPPYB-1-R&_cdi=5561&_user=217827&_pi) (27 March 2010)

LAI W.L., KOU S.C., TSANG W.F., POON C.S. *"Characterization of concrete properties from dielectric properties using ground penetrating radar"*. CEMENT AND CONCRETE RESEARCH, Vol. 39, No. 8, pp.687-695 (2009) (http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6TWG-4WFPPJR-2&_user=107833&_rdoc=1&_fmt=&)

LAI, W.L., KOU, S.C., POON, C.S., TSANG, W.F., NG, S.P., HUNG, Y.Y. "*Characterization of Flaws Embedded in Externally Bonded CFRP on Concrete Beams by Infrared Thermography and Shearography"*. Journal of Nondestructive Evaluation, Vol. Volume 28, No. Issue1 , pp.Page 27-35 ((2009)

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LAI, W. L, TSANG, W. F. *"Experimental Evaluation of Honeycombed Concrete by Surface Penetrating Radar"*. The ASNT Fall Conference and Exhibition, Columbus, Ohio, USA, October 17-21, 2005 , pp.435-438 (2005)

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	CHAN, FIONA W Y, TSANG, STEVEN W F *"Effects of Different Sonic Access Tube Materials on the Signal Strength of Ultrasonic Waves in the Cross-hole Sonic Logging Technique"*. HKIE Transactions, Vol. 12, No. 2, pp.1-7 (2005) TSANG W.F., CHAN F.W.Y *"Earth Echo Sounding Technique for Quality Control of Drilled Shaft Foundations"*. INSIGHT Journal of the British Institute of Non-Destructive Testing (BINDT), Vol. 46, No. 1, pp.17-22 (January 2004) TSANG W.F., LAI W.L., CHAN W.Y. *"A Preliminary Study of Data Fusion Techniques (DFTs) on Evaluation of Defective Concrete by Pulsed Radar and Ultrasonic Systems"*. Conference Proceedings of the British Institute of Non-Destructive Testing, NDT, UK, (2003) TSANG W.F., CHU Y.L. *"Structural Integrity Assessment of Reinforced Concrete Balcony by Instrumented Impact Hammer Technique"*. Conference Proceedings of the British Institute of Non-Destructive Testing, NDT, UK, (2003) TSANG W.F., CHAN F.W.Y. *"The Application of an In-house Multiple Referencing System (MRS) for Evaluation of Foundation Concrete Elements"*. Conference Proceedings of the British Institute of Non-Destructive Testing, NDT, UK, (2003)

Subject Description Form

Subject Code	BRE453
Subject Title	Building Services II
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	BRE349 Nil Nil
Objectives	1. Provide further knowledge of building services engineering systems, including the ventilation and air conditioning system, acoustics and vibration control systems, and information systems; 2. Understand the importance of the quality of installation and proper co-ordination on the overall performance and maintainability of buildings; 3. Provide students an understanding that sustainability can be achieved by environmental-friendly design of building services systems.
Intended Learning Outcomes	*Students will demonstrate their ability to:-* a. Understand the principles and various attributes of ventilation and air conditioning systems; b. Have an understanding of the importance of energy conservation in buildings for environmental protection, and the use of renewable resources in buildings for sustainability; c. Perform analyses on acoustic and vibration control of building services systems; d. Have an understanding of the concepts of green buildings, intelligent building, building automation, and information system of buildings; e. Properly co-ordinate the installation, commissioning and maintenance of various building services systems; and perform life-cycle cost analysis for selection of appropriate building services systems.
Subject Synopsis/ Indicative Syllabus	Integrated design: factors affecting selection of services/systems. Provision of space in the building to accommodate building services. Structural integrity of building services equipment. Sound and vibration attenuation features. Provisions for safe operation and maintenance. Building services engineering system for intelligent buildings: introduction to information transmission systems, communication and protection system, call systems, public address system and Building automation/management systems. The concepts and importance of energy conservation and energy efficiency for environmental protection, environmental protection and maintenance of building services systems, selection of environmentally friendly products and materials used in building services systems.

	Co-ordination and management of design and installation of various building services systems during the design and construction stages in particular the builder's works; and testing and commissioning of building services systems. Indoor air quality and sick building syndrome. The impacts of life-cycle-cost on planning and implementation. An appreciation of capital and operating costs. Implication of low cost inefficient equipment, poor installation, inadequate access for maintenance.
Teaching/Learning Methodology	The subject can be divided into three main parts; introduction to complex building services systems; management, co-ordination, installation and maintenance of the building services systems; and introduction to sustainable buildings and environmental-friendly design of building services systems. A "case oriented" approach is to be adopted for teaching the subject; A number of up-to-date case studies on building services systems of high-rise buildings are used to illustrate the current state-of-the-art on the design and operation of complex building service systems. Where applicable, practitioners from the industries will be invited to present lecture on the management of the building services installations and on operation and maintenance of building services systems. The subject will be delivered through lectures, laboratories (where applicable) and small groups tutorials. The lectures and laboratories aim at introducing theories, concepts and practices whereas tutorials are for in-depth small group discussions.
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:

Examination and coursework will contribute 70% and 30% of the overall mark for the subject respectively. The coursework mark will be based on the assessments of assignments, presentations, and in-class tests. One of the assignments will be in the form of case study; students will be asked to carry out a critical investigation of the building services systems of a building of their choice and to comment on the systems adopted, the installation and integration with other systems. Another assignment will be on engineering analysis of building services systems. Both the coursework and examination 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	21 Hrs.
	▪ Tutorials	21 Hrs.
	Other student study effort:	
	▪	78 Hrs.
	▪	Hrs.
	Total student study effort	120 Hrs.
Reading List and References	**Reading List:** **Recommended:** Stein B. Reynolds J.S. & McGuinness W.J. (1986) *Mechanical and Electrical Equipment for Buildings*, 7th Edition, Volume 1 & 2, John Wiley & Sons Chadderton D.V. (1991) *Building Services Engineering*, E. & F.N. Spon Hassan G. (1996) *Building Services*, Macmillan Greeno R. (1996) *Building Services and Design*, Longman Barton P.K. (1983) *Building Services Integration*, E & F.N. Spon CIBSE (1994) *Building Services Maintenance Management*, CIBSE **Supplementary:** Hall F. (1988) *Essential Building Services & Equipment*, Newnes Atkin B. (1993) *Intelligent Buildings: Application of IT and Building Automation to High Technology Construction Projects*, Unicom Seminars, England	

Subject Description Form

Subject Code	BRE477
Subject Title	Dissertation
Credit Value	6
Level	4
Pre-requisite / Co-requisite/ Exclusion	BRE377
Objectives	The aim of the Dissertation is to provide students with the opportunity of demonstrating research competence by providing them with a vehicle through which they can reveal a full understanding and evaluation of an issue or a topic that they choose to investigate. The issue or the topic should be relevant to the construction and real estate industry and of particular concern to Hong Kong and its neighbouring environments. The study might include an extensive literature review; the discovery, development or enhancement of a research model; the development of a measurement instrument, such as a questionnaire; or the comparison of statistical models for the evaluation of existing data. Where appropriate, students might join a departmental research group where they would be able to assist staff by working in a particular field of study.
Intended Learning Outcomes	Upon completion of the subject, students will be able to complete a research leading to a dissertation. They should be able to: a) produce a research proposal related to a topic in the field of construction and real estate; b) apply an appropriate research methodology to the chosen topic; c) conduct a critical and comprehensive literature review; d) analyse data and evaluate findings; e) communicate their ideas in a clear, concise and precise manner; and f) produce a dissertation that is based on their research and written in good English.
Subject Synopsis/ Indicative Syllabus	**Property Management and Surveying students** will identify a topic in the field of construction and real estate to study in depth in the final year. The Dissertations are grouped into a number of study areas within the research theme of the Department such as real estate investment and finance, land and construction economics, construction management and construction technology and science, and property and facilities management. **BEM students** will be advised to identify a topic in the field of Building Engineering and Management. The topic should be engineering-oriented or engineering related area in construction. The Dissertations are grouped into a number of study areas within the research themes of the Department such as construction technology and science, production engineering, production and contract management, engineering economics, construction quality in engineering works, application of information technology in the building industry, engineering materials, etc. Occasionally, if a student proposes a topic which is not within the context of engineering orientation, consideration and prior approval need to be sought from the BEM Programme Management Team.

Teaching/Learning Methodology

Academic leadership is provided by the Dissertation Committee comprising Dissertation Co-ordinators and Scheme Chair. The Committee is assisted by the supervisors who are BRE academic staff with research experience.

Each student will work under the guidance of a supervisor and, if necessary, a second supervisor may be appointed to assist in project supervision. The project supervision is timetabled for one hour per two weeks over the whole dissertation study period, but students are expected to devote about a day per week of their own time to carry out study and research work. Students are encouraged to formulate a testable hypothesis with theoretical model or justifications; carry out an empirical test on the hypothesis; and draw inference(s) on research and practical implications from the findings.

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	f
1. Final Proposal	15%	✓	✓	✓			
2. Progress and Efforts	15%		✓	✓	✓		
3. Completed Dissertations	70%		✓	✓	✓	✓	✓
Total	100 %						

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

The assessment of each of the three tasks (Final Proposal, Progress and Efforts, and Completed Dissertations) will be made based an "Assessment Rubrics" that will be adopted and approved by the Dissertation Committee. The "Assessment Rubrics" will be made available for reference by both students and supervisors on the Dissertation Guide web-pages. The main criteria are underlined as listed below.

Final Proposal
The Final Proposal should include a problem statement, a preliminary literature review, the study's aim and objectives, an outline of the research methodology, means of data analysis, and a reference list.

(1) <u>Problem Statement</u> A concise and precise explanation of the problem that the research intends to address and an outline of the scope of study. This in effect provides the purpose of the study.

(2) <u>Literature Review</u> A summary of the relevant theories, research evidence, and descriptive materials bearing on the proposed research, including all information, published or otherwise, that aids in understanding and helps to explain the background to the research.

(3) <u>Aim and Objectives</u> Linking of the problem statement and literature review should be made through a precise statement of a research aim and a number of specific objectives. If a testable question (hypothesis) is to be used then this should be clearly stated. This section is a critical part of the research proposal because the aim and objectives need to be consistent with the purpose of the study.

(4) Research Methodology A statement describing the research design and data collection techniques must be provided. The description must be sufficiently detailed to permit an understanding of the proposed study without discussion with the student. If a questionnaire survey is to be conducted, a provisional questionnaire should be included. Sources of data and sampling technique should be identified along with any restrictions on confidentially and possible problems in data collection. The time required for phases of the study should be specified.

(5) Data Analysis The way in which the data will be analyzed, including any statistical analysis, should be outlined. If a non-standard form of data analysis is to be used, justification should be given. If computer programs are to be used, they should be identified.

(6) Reference and Bibliographic List Students are recommended to use the Harvard referencing system. Alternatively, students can refer to the Student Handbook for other referencing systems, provided that consistency is adhered to.

Progress and Efforts

During the progress of the research, the student and Supervisor will meet for consultation. It is the responsibility of students to arrange meetings with their supervisors in order that they may report and discuss their progress. It is expected that students devote sufficient time to the Dissertation bearing in mind the requirements outlined in the subject syllabus.

Discussions with Supervisors are essential to explore the challenges faced by the student as they learn about the research topic through the research process. Thus, students are required to produce evidence of their work at their meetings with their Supervisors, so that the problems encountered can be shared and solved together.

Assessment Pro-forma for "Proposal and Progress" (weighted 30% towards the overall grade)

Element	Criteria	Weighting
Final Proposal	Adequacy, structure, clarity, originality, length	15%
Progress Report	Consultations, diligence, enthusiasm, planning	15%
	Total	**30%**

Completed Dissertation

The Dissertation should include a declaration, an abstract, an introduction, aim and objectives, methodology, literature review, data collection, analysis, and conclusions.
For the purpose of criterion-based assessment, the assessment of the completed Dissertation is divided into six elements, i.e. presentation, aim and objectives, research methodology, literature review, data collection and analysis, conclusions and findings, with a corresponding weighting.

(1) Aim and Objectives A re-statement of the aim and objectives in the Final Proposal (may be included in the Introduction).

(2) Methodology A clear statement of the planned research methods, as well as reporting of any ways in which the original methodology was modified as a result of constraints imposed in actually conducting the research. Some writers included this in the Introduction.

(3) Literature Review The literature search should be fully described showing

the keywords and scientific databases used. A strong emphasis should be placed on refereed journal papers which can provide evidence of existing knowledge of the selected topic, obtained through scientific methods. The review should not only describe relevant theories, previous research, and descriptive material that have a bearing on the study, but also evaluate its worth. Evidence of independent analysis of the available literature should also be demonstrated. A basis for the chosen research topic should be established.

(4) Data Collection This section should provide a clear and objective picture of the way in which the data was collected, including identification of any problems encountered and an explanation of the outcome obtained. The data should be summarized and presented in an appropriate form, such as tables and graphs, and not be evaluated or interpreted. Although some writers include analysis of the data in this section, others prefer to cover it separately.

(5) Analysis This section should include the analysis and interpretation of the results of the research. The discussion should explain the degree to which the research objectives were achieved, the possible reasons for non-attainment of some objectives, the ways in which the theories did or did not help to examine the problem, and an evaluation of the research results. In many reports, this section is the most important and often the longest in terms of words.

(6) Conclusions The conclusions or outcomes of the study should be presented in this section. Included should be the major results that the study has achieved, identification of unanswered questions and directions for further study, speculation about the importance of the findings to the body of knowledge in the construction and real estate fields and any other related items that the student wishes to emphasize.

Assessment Pro-forma for "Completed Dissertation" (weighted 70% towards the overall grade)

Element	Criteria	Weighting
Presentation	Syntax, clarity, conciseness, preciseness, structure, aesthetics, graphics, length	10%
Aim and Objectives	Appropriateness and accomplishment of stated aim and objectives, accuracy of application	5%
Research Methodology	Appropriateness, achievability, planning of research design, comprehensiveness, description	15%
Literature Review	Relevant parameters, adequate depth and breadth, accuracy, citations and references	15%
Data Collection and Analysis	Relevancy, accuracy, adequacy, coherence of data analysis, logicality of interpretation	15%
Conclusions and Findings	Validity, logicality, substantiveness, originality, degree of critique, new ideas or models	10%
	Total	**70%**

Student Study Effort Expected	Class contact:	
	▪ Guided study and project work	184 Hrs.
	Other student study effort:	
	▪ Independent study	240 Hrs.
	Total student study effort	424 Hrs.

Reading List and References

Essential:

HKPolyU Building and Real Estate Department. *Dissertation Guide.* Continuously updated.

Recommended:

Bell, J. (1993) *Doing Your Research Project*, Open University Press.

Blaikie, N (2000) *Designing Social Research: The Logic of Anticipation*. Cambridge: Polity.

Booth, W.C., Colomb, G.G. and Williams, J.M. (2003) *The Craft of Research*, 2nd ed. Chicago: The University of Chicago Press.

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Pindyck, R.S. and Rubinfeld, D.L. (1998) *Econometric Models and Economic Forecasts, 4th Edition*, Boston: McGraw-Hill International Editions.

Raftery J., McGeorge D. and Walters M. (1997) Breaking Up Methodological Monopolies: A Multiparadigm Approach to Construction Management Research. *Construction Management and Economics*, 15:3, 291-97.

Render, B. and Stair, R.M. Jr (2000) *Quantitative Analysis for Management, 7th Edition*. Prentice Hall, New Jersey.

Tan, W. (2002) *Practical Research Methods.* Pearson Education Asia Pte Ltd., Singapore.