1.0 INTRODUCTION

1.1 School of Housing, Building and Planning

The School of Housing, Building and Planning (HBP), Universiti Sains Malaysia (USM) was established in 1972 with the aim of producing skilled personnels capable of implementing the relevant planning, design and development processes necessary for Malaysia's development. After more than three decades, the school has made tremendous progress in teaching, research, consultancy and publication.

The academic staffs currently exceed eighty with more than half have doctoral degrees and many staffs have professional qualification in their respective fields. Currently, there are seven undergraduate programmes offered by the school. A few programmes are recognized by the respective professional bodies such as the Malaysian Institute of Planners (MIP), Board of Architects Malaysia (LAM), Board of Quantity Surveyors Malaysia (BQSM), Royal Institute of Chartered Surveyors (RICS), Pacific Association of Quantity Surveyors (PAQS) and Chartered Association of Building Engineers (CABE).

Recognition:



The broad-based approach combined with professional specialisms provides our graduates the necessary edge in dealing with the building construction and development processes in a holistic manner. The globalization era is upon the School of HBP and inevitably brings with it the wind of change and challenges. The School acknowledges the need to understand and accommodate these challenges by re-aligning strategies and be innovative in various aspects of education and management. The integrated hybridized nature of the curriculum are maintained but the focus on teaching, learning, research, consultancy and administration will continuously be updated and innovated. The realization of the School's vision as a center of excellence in the Built Environment requires wholesome support and proper implementation of sound policies and strategies.

HBP's mission is to prepare a platform which can generate structures and society that are eco and environmental friendly, besides allowing for an academic legacy that will be respected, emulated and sustained.

There are eight major issues that have been identified with performances monitored in order to enhance efficiency and effectiveness periodically.

- 1. Human Resources To strengthen academic quality to the highest level. This can be exemplified by the recognition given to the academic staff in the field of building technology, quantity surveying, planning, interior design, construction management, building surveying and architecture. Academic staff are directly responsible in enhancing the quality of learning and teaching.
- 2. Teaching-Learning To enhance the quality of work and enable staff to quickly confront the world of information fast.
- 3. Research To be proactive in research and development at local and international level.
- 4. Internationalisation To develop mutual networks and linkages between individuals and universities.
- 5. Management To strive for a higher level of transparency, quality and productivity.
- 6. Finance To improve the sources of income.
- Infrastructure To enhance infrastructure capabilities by using up-to-date hardware components, building upon software licenses and allowing for the rapid movement of interactive experimental websites.
- 8. Partnership To enhance and improve upon the demand of offered courses.

Premised upon this over all strategy, it is hoped that the students of HBP will be sensitive to the current needs, able to adapt to new changes, can overcome future obstacles and most importantly, able to use their knowledge and experience in HBP to build and develop an environmentally-conscious society, and subsequently a 'healthy' world.

In general, HBP graduates are expected to contribute their expertise in various sectors as administrators and professionals of building and construction projects. Many graduates have also extended their studies to obtain higher level of professionalism as well as higher academic qualifications.

1.2 Vision of HBP

"Championing a sustainable tomorrow through holistic education and upholding a global mindset"

1.3 Mission

- To establish HBP as the best Built Environment School with emphasis on sustainability
- To produce outstanding graduates for the global market
- To position HBP as a centre of expertise in identified niche areas
- To be at the fore front of knowledge transfer and be relevant to the needs of the community (bottom billion)

1.4 Administrative Staffs

DEAN



Professor Dr. Aldrin Abdullah

DEPUTY DEAN



Professor Dr. Ahmad Sanusi Hassan (Academic)



Professor Sr Dr. Mastura Jaafar (Research)

MANAGER



Dr. Nor Zarifah Maliki (Networking and Alumni Liaison)



Assoc. Prof. Ir. Dr. Abdul Naser Abdul Ghani (Income Generation)

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CHAIRMAN: CLUSTER DESIGN



Assoc. Prof. Ar. Dr. Sharifah Fairuz Syed Fadzil (Chairman)

PROGRAMME HEAD



Dr. Mazran Ismail

(Architecture)



Dr. Safial Aqbar Zakaria (Interior Design)

CHAIRMAN: CLUSTER PLANNING



Assoc. Prof. Dr. Nurwati Badarulzaman (Chairman & Programme Head)

CHAIRMAN: CLUSTER TECHNOLOGY



Assoc Prof. Dr. Noor Faisal Abas (Chairman)

PROGRAMME HEAD



Dr. Norhidayah Md Ulang (Building Technology)



Sr Dr. Md Azree Othuman Mydin (Building Surveying)

CHAIRMAN: CLUSTER ECONOMIC & CONSTRUCTION



Sr Dr. Hasnanywati Hassan (Chairman)

PROGRAMME HEAD



Dr. Mohd Hanizun Hanafi (Construction Management)



Assoc. Prof. Sr Lim Yoke Mui (Quantity Survey)

PRINCIPAL ASSISTANT REGISTRAR



Mr. Abd. Manaf Muhamad Yunus

SENIOR ASSISTANT REGISTRAR



Mr. Iftitah Abdul Razak

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2.0 ACADEMIC SYSTEM AND GENERAL INFORMATION

2.1 Course Registration

Registration of courses is an important activity during the period of study at the university. It is the first step for the students to sit for the examination at the end of each semester. Signing up for the right courses each semester will help to facilitate the graduation of each student from the first semester till the final semester.

2.1.1 Course Registration Secretariat for the Bachelor Degree and University's Diploma Students

Student Data and Records Section (SDRP) Academic Management Division Registry (Level 1, Chancellory Building)

Tel. No.	:	04-653 2925/2924/2923
Fax No.	:	04-657 4641
E-Mail	:	sdrp@usm.my
Website	:	http://registry.usm.my/updr

The SDRP office is the Secretariat/Coordinator of course registration for the Bachelor Degree and Diploma Programme of the University.

Further inquiries regarding course registration activities for the first degree and diploma can be made at the office of the Student Data and Records Section. Please refer to the contact number above.

2.1.2 Course Registration Platform

(i) *E-Daftar* (E-Registration)

E-Daftar is a platform for on-line course registration. The registration is done directly through the Campus Online portal (https://campusonline.usm.my).

Registration under *E-Daftar* for Semester 1 usually starts 1-2 days after the release of 'Official' examination results of Semester 2 of the previous academic year. The system closes a day before Semester 1 begins (in September). *E-Daftar* registration for Semester 2 usually starts 1-2 days after the Semester 1 'Provisional' examination results are released until a day before Semester 2 begins (in February).

The actual timing of registration under *E-Daftar* will be announced by the Student Data and Records Section during the Revision Week of every semester and will be displayed on the respective Schools/Centres/Hostels' bulletin boards and in the USM's official website.

Under *E-Daftar*, students can register for any courses offered by USM, except co-curriculum courses. Registration of co-curriculum courses is still placed under the administration of the Director of the Centre for Co-Curriculum Programme at the Main Campus or the Coordinator of the Co-Curriculum Programme at the Engineering Campus and the Coordinator of the Co-Curriculum Programme at the Health Campus.

Co-Curriculum courses will be included in the students' course registration account prior to the *E-Daftar* activity, if their pre-registration application is successful.

(ii) Access to E-Daftar System

- a. *E-Daftar* System can be accessed through the Campus Online portal (https://campusonline.usm.my).
- b. Students need to use the E-Mail ID and password to access their profile page, which includes the *E-Daftar* menu.
- c. Students need to click on the *E-Daftar* menu to access and register for the relevant courses.
- d. Students are advised to print the course registration confirmation slip upon completion of the registration process or after updating the course registration list (add/ drop) within the *E-Daftar* period.
- e. The *E-Daftar* system can only be accessed for a certain period of time.
- f. Guidelines to register/gain access to the *E-Daftar* portal are available at the Campus Online portal's main page.

(iii) Online Course Registration (OCR) in Schools/Centres

OCR activities are conducted in the Schools/Centres and are applicable to students who are academically active and under Probation (P1/P2) status. Students who face difficulties registering their courses during the *E-Daftar* period can register their courses during the official period of OCR alternatively. Each school is responsible for scheduling this activity.

The official period for OCR normally starts on the first day of the semester (without the penalty charge of RM50.00). After this

official date, the registration will be considered late (a penalty of RM50.00 will be imposed if no reasonable excuse is given).

During the non-penalty period, OCR will be conducted at each School. After Week Six, all registration, including adding and dropping of courses will be administered by the Examination and Graduation Section Office (Academic Management Division, Registry).

2.1.3 The Frequency of Course Registration in One Academic Session

- (i) Normal Study Semester
 - 2 times per year (beginning of Semester 1 & Semester 2)
- (ii) <u>Long semester break</u> (about one month after the final examination of Semester **2**)
 - Once per year

2.1.4 General Guidelines before Students Register for Courses

- (i) Matters/Information/Documents required to be noted/considered/ referred to by students before course registration:
 - Refer to the respective School's website to get updated information for courses offered or course registration.
 - Decide on courses to be registered according to the semester as stipulated in the Study Programme Guide Book.
 - List of courses to be registered and number of units (unit value) for each course.
 - Provide Cumulative Statement of Grades (Cangred).
 - Construct Teaching and Learning Timetable for the registered courses (to avoid overlapping in timetable).
 - Read and comprehend the reminders regarding policies/general requirements for the course registration.
- (ii) The number of maximum and minimum units that can be registered in every semester **is** stated below:

Academic Status	Minimum Units	Maximum Units
Active	9	21
P1	9	12
P2	9	10

Determination of academic status in a semester is based on the students' academic performance in the previous semester (Grade Point Average, GPA):

- * GPA 2.00 & above = Active Academic Status
- * GPA 1.99 & below = Probation Academic Status (P1/P2)
- Students who meet the minimum period of residency (6 semesters for a 3 year programme, 7 semesters for a 3.5 year programme or 8 semesters for a 4 year programme) are allowed to register courses with a total of less than 9 units. The semester in which the student is on leave is not considered for the residency period.
- (iii) Type of course codes during registration:

Т	= Core courses	٦
Е	= Elective courses	
М	= Minor courses	i
U	= University courses	J
	2	

Grade and number of units obtained from these courses are considered for graduation

Two (2) other course codes are:

- **Y** = audit courses
- **Z** = prerequisite courses

Grade and number of units obtained from these courses are not considered for graduation.

- (iv) Advice and approval of the Academic Advisor
 - Approval from the Academic Advisor is required for students under Probation status before they are allowed to register during the OCR period. Probation students cannot access *E-Daftar* for registration.
 - Approval from the Academic Advisor is not required for students under Active Status to register courses through *E*-*Daftar*.
- (v) Students are not allowed to register and repeat any course for which they have achieved a grade 'C' and above.

2.1.5 Information/Document Given To All Students through Campus Online Portal (https://campusonline.usm.my)

- (i) The information of Academic Advisor.
- (ii) Academic information such as academic status, GPA value, CGPA value and year of study.
- (iii) Cangred and Course Registration Form.
- (iv) List of courses offered by all Schools/Centres.
- (v) Teaching and Learning Timetable for all Schools/Centres/Units from the three campuses.
- (vi) List of pre-registered courses which have been added into the students' course registration record (if any).
- (vii) Reminders about the University course registration policies/general requisites.

2.1.6 Registration of Language and Co-Curriculum Courses

- (a) Registration of Language courses through *E-Daftar* is allowed.
 - However, if any problem arises, registration for language courses can still be carried out/updated during the official period of OCR at the office of the School of Languages, Literacies and Translation.
 - All approval/registration/dropping/adding of language courses is under the responsibility and administration of the School of Languages, Literacies and Translation.
 - Any problems related to the registration of language courses can be referred to the School of Languages, Literacies and Translation. The contact details are as follows:

General Office	:	04-653 4542/)	
		5243/ 5248	for Main	ı
Malay Language Programme Chairperson	:	04-6533974	Campus	S
English Language Programme Chairperson	:	04-6533406	students	S
Foreign Language Programme Chairperson	:	04-6533396	J	
Engineering Campus Programme Chairperso	on	: 04-5995407		
	:	04-5996385		
Health Campus Programme Chairperson	:	09-7671252		

- (b) Registration for <u>co-curricular courses through *E-Daftar*</u> is not allowed.
 - ✤ Registration for co-curricular courses is either done through pre-registration before the semester begins or during the first/second week of the semester. Co-curricular courses will be included in the students' course registration account prior to the *E-Daftar* activity, if their pre-registration application is successful.
 - All approval/registration/dropping/adding of co-curricular courses is under the responsibility and administration of:

Director of the Centre for Co-Curricular Programme, Main Campus (04-653 5242/5243/5248)

Coordinator of the Centre for Co-Curricular Programme, Engineering Campus (04-599 5097/6385)

Coordinator of the Centre for Co-Curricular Programme, Health Campus (09-767 7547)

(c) **Dropping of Language and Co-Curriculum courses, if necessary, must be made within the first week**. After the first week, a fine of RM50.00 will be imposed.

2.1.7 Registration of 'Audit' Courses (Y code)

Registration for the 'Audit' course (Y code) is not allowed in the <u>E-Daftar</u>. It can only be done during the official period of OCR in the School or Centre involved. Students who are interested must complete the course registration form which can be printed from the Campus Online Portal or obtained directly from the School. Approval from the lecturers of the courses to be audited and the Dean/ Deputy Dean (Academic) (signed and stamped) in the course registration form is required.

Registration of 'Audit' courses (Y code) is <u>not included in the</u> <u>calculation of the total registered workload units</u>. Grades obtained from 'Audit' course are not considered in the calculation of CGPA and total units for graduation.

2.1.8 Registration of Prerequisite Courses (Z code)

Registration of Prerequisite courses (Z code) is <u>included in the total</u> registered workload (units). Grades obtained from the Prerequisite courses are not considered in the calculation of CGPA and units for graduation.

2.1.9 Late Course Registration/Late Course Addition

Late course registration or addition is not allowed after the official period of the OCR ends unless with valid reasons. General information on this matter is as follows:

- (i) Late course registration and addition are only allowed in the first to the third week with the approval of the Dean. Students will be fined RM50.00 if the reasons given are not acceptable.
- (ii) Application to add a course **after the third week** will not be considered, except for special cases approved by the University.

2.1.10 Dropping of Courses

Dropping of courses is allowed until the **end of the sixth week**.

For this purpose, students must meet the requirements set by the University as follows:

- (i) Dropping Course Form must be completed by the student and signed by the lecturer of the course involved and the Dean/Deputy Dean of their respective Schools and submitted to the general office of the School/Centre which is responsible for offering the courses involved.
- (ii) Students who wish to drop a language course must obtain the signature and stamp of the Dean of the School of Languages, Literacies and Translation, as well as the signature and stamp of the Dean of their respective schools.
- (iii) Students who wish to drop the Co-Curriculum courses must obtain the approval of the Centre for Co-Curriculum Programme and the signature and stamp of the Dean of their respective schools.
- (iv) The option for dropping courses cannot be misused. Lecturers have the right not to certify the course that the student wishes to drop if the student is not serious, such as poor attendance record at lectures, tutorials and practical, as well as poor performance in coursework. The student will be barred from sitting for the examination and will be given grade 'X' and is not allowed to repeat the course during the *Courses during the Long Vacation* (KSCP) period.

2.1.11 Course Registration Confirmation Slip

The course registration confirmation slip that has been printed/ obtained after registering the course should be checked carefully to ensure there are no errors, especially the code type of the registered courses. Any data errors for course registration must be corrected immediately whether during the period of *E-Daftar* (for students with active status only) or during the period of OCR at the Schools.

2.1.12 Revising and Updating Data/Information/Students' Personal and Academic Records

Personal and academic information for each student can be checked through the Campus Online portal (https://campusonline.usm.my). Students are advised to always check all the information displayed on this website.

- The office of the Student Data and Records Section must be notified of any application/notification for correction/updating of personal data such as the spelling of names (names must be spelled as shown on the Identification Card), Identification Card number and address (permanent address and correspondence address).
- The office of the Student Data and Records Section must be notified of any application/ notification for correction of academic data such as information on Major, Minor, MUET result and the course code.
- The office of the Examination and Graduation Section must be notified of any application/notification for correction of the examination/results data.

2.1.13 Academic Advisor

Each School will appoint an Academic Advisor for each student. Academic Advisors comprise academic staff (lecturers) of the school. Normally, the appointment of Academic Advisors will be made known to every student during the first semester in the first year of their studies.

Academic Advisors will advise their students under their responsibility on academic-related matters. **Important advice for the students includes the registration planning for certain courses in each semester during the study period**. Before registering the course, students are advised to consult and discuss with their Academic Advisors to determine the courses to be registered in a semester.

2.2 Interpretation of Unit/Credit/Course

2.2.1 Unit

Each course is given a value, which is called a **UNIT**. The unit is determined by the scope of its syllabus and the workload for the students. In general, a unit is defined as follows:

Type of Course	Definition of Unit
Theory	1 unit is equivalent to 1 contact hour per week for $13 - 14$ weeks in one semester
Practical/Laboratory/ Language Proficiency	1 unit is equivalent to 1.5 contact hours per week for $13 - 14$ hours in one semester
Industrial Training/ Teaching Practice	1 unit is equivalent to 2 weeks of training

Based on the requirements of Malaysian Qualifications Framework (MQF):

One unit is equivalent to 40 hours of student learning time

[1 unit = 40 hours of Student Learning Time (SLT)]

2.2.2 Accumulated Credit Unit

Units registered and passed are known as credits. To graduate, students must accumulate the total number of credits stipulated for the programme concerned.

2.3 Examination System

Examinations are held at the end of every semester. Students have to sit for the examination of the courses they have registered for. Students are required to settle all due fees and fulfil the standing requirements for lectures/tutorials/practical and other requirements before being allowed to sit for the examination of the courses they have registered for. Course evaluation will be based on the two components of coursework and final examinations. Coursework evaluation includes tests, essays, projects, assignments and participation in tutorials.

2.3.1 Duration of Examination

Evaluated Courses	Examination Duration
2 units	1 hour for coursework of more than 40%
2 units	2 hours for coursework of 40% and below
3 units or more	2 hours for coursework of more than 40%
3 units or more	3 hours for coursework of 40% and below

2.3.2 Barring from Examination

Students will be barred from sitting for the final examination if they do not fulfil the course requirements, such as absence from lectures and tutorials of at least 70%, and have not completed/fulfilled the required components of coursework. Students will also be barred from sitting for the final examination if they have not settled the academic fees. A grade 'X' would be awarded for a course for which a student is barred. Students will not be allowed to repeat the course during the *Courses during the Long Vacation* (KSCP) period.

2.3.3 Grade Point Average System

Students' academic achievement for registered courses will be graded as follows:

Alphabetic Grade	А	A-	B+	В	B-	C+	С	C-	D+	D	D-	F
Grade Points	4.00	3.67	3.33	3.00	2.67	2.33	2.00	1.67	1.33	1.00	0.67	0

Students awarded with a grade 'C-' and below for a particular course would be given a chance to improve their grades by repeating the course during the KSCP (see below) or normal semester. Students awarded with a grade 'C' and above for a particular course will not be allowed to repeat the course whether during KSCP or normal semester.

The achievement of students in any semester is based on Grade Point Average (GPA) achieved from all the registered courses in a particular semester. GPA is the indicator to determine the academic performance of students in any semester.

CGPA is the Cumulative Grade Point Average accumulated by a student from one semester to another during the years of study.

The formula to compute GPA and CGPA is as follows:

Grade Point Average =
$$\sum_{i=1}^{n} U_i M_i$$

$$\sum_{i=1}^{n} U_i$$

where:

n	=	Number of courses taken
Ui	=	Course units for course i
M _i	=	Grade point for course i

Example of calculation for GPA and CGPA:

	Course	Unit	Grade Point (GP)	Grade (G)	Total GP
Semester I	ABC XX1	4	3.00	В	12.00
	ABC XX2	4	2.33	C+	9.32
	BCD XX3	3	1.67	C-	5.01
	CDE XX4	4	2.00	С	8.00
	EFG XX5	3	1.33	D+	3.99
	EFG XX6	2	2.67	B-	5.34
		20			43.66

$$GPA = \frac{43.66}{20} = 2.18$$

	Course	Unit	Grade Point (GP)	Grade (G)	Total GP
Semester II	ABC XX7	3	1.00	D	3.00
	ABB XX8	4	2.33	C+	9.32
	BBC XX9	4	2.00	С	8.00
	BCB X10	4	2.67	B-	10.68
	XYZ XX1	3	3.33	B+	9.99
		18			40.99

$$GPA = \frac{40.99}{18} = 2.28$$

 $CGPA = \frac{\text{Total Accumulated GP}}{\text{Total Accumulated Unit}} = \frac{43.66 + 40.99}{20 + 18} = \frac{84.65}{38} = 2.23$

From the above examples, the CGPA is calculated as the total grade point accumulated for all the registered courses and divided by the total number of the registered units.

2.3.4 Courses During the Long Vacation (Kursus Semasa Cuti Panjang) (KSCP)

KSCP is offered to students who have taken a course earlier and obtained a grade of 'C-', 'D+', 'D', 'D-', 'F' and 'DK' only. Students who have obtained a grade 'X' or 'F*' are not allowed to take the course during KSCP.

The purpose of KSCP is to:

- (i) Give an opportunity to students who are facing time constraints for graduation.
- (ii) Assist students who need to accumulate a few more credits for graduation.
- (iii) Assist "probationary" students to enhance their academic status.
- (iv) Assist students who need to repeat a prerequisite course, which is not offered in the following semester.

However, this opportunity is only given to students who are taking courses that they have attempted before and achieved a grade as stipulated above, provided that the course is being offered. Priority is given to final year students. Usually, formal lectures are not held, and teaching is via tutorials.

The duration of KSCP is 3 weeks, i.e. 2 weeks of tutorial and 1 week of examination, all held during the long vacation. The KSCP schedule is available in the University's Academic Calendar.

The Implementation of KSCP

- (i) Students are allowed to register for a maximum of 3 courses and the total number of units registered must not exceed 10.
- (ii) Marks/grades for coursework are taken from the highest marks/the best grades obtained in a particular course in the normal semester before KSCP. The final overall grade is determined as follows:

Final Grade = The best coursework marks or grade + Marks or grade for KSCP examination

(iii) GPA calculation involves the **LATEST** grades (obtained in KSCP) and also involves courses taken in the second semester and those

repeated in KSCP. If the GPA during KSCP as calculated above is 2.00 or better, the academic status will be active, even though the academic status for the second semester was probation status. However, if the GPA for KSCP (as calculated above) is 1.99 or below, the academic status will remain as probation status for the second semester.

(iv) Graduating students (those who have fulfilled the graduation requirements) in the second semester are not allowed to register for KSCP.

2.3.5 Academic Status

<u>Active Status</u>: Any student who achieves a GPA of 2.00 and above for any examination in a semester will be recognised as ACTIVE and be allowed to pursue his/her studies for the following semester.

<u>Probation Status</u>: A probation status is given to any student who achieves a GPA of 1.99 and below. A student who is under probation status for three consecutive semesters (P1, P2, FO) will not be allowed to pursue his/her studies at the university. On the other hand, if the CGPA is 2.00 and above, the student concerned will be allowed to pursue his/her studies and will remain at P2 status.

2.3.6 Termination of Candidature

Without any prejudice to the above regulations, the University Examination Council has the absolute right to terminate any student's studies if his/her academic achievement does not satisfy and fulfil the accumulated minimum credits.

The University Examination Council has the right to terminate any student's studies due to certain reasons (a student who has not registered for the courses, has not attended the examination without valid reasons), as well as medical reasons can be disqualified from pursuing his/her studies.

2.3.7 Examination Results

A provisional result (pass/fail) through the Campus Online portal (campusonline.usm.my) and short message service (SMS) will usually be released and announced after the School Examination Council meeting and approximately one month after the final examination.

Enquiries regarding full results (grade) can be made through the Campus Online portal and short message service (SMS). The results will be released and announced after the University Examination Council meeting and is usually two weeks after the provisional results are released.

Students can print their official semester results document namely 'SEMGRED' through the portal "*Campus Online*" (campusonline.usm.my) during the second week of the following semester.

2.4 Unit Exemption

2.4.1 Unit Exemption

Unit exemption is defined as the total number of units given to students who are pursuing their studies in USM that are exempted from the graduation requirements. Students only need to accumulate the remaining units for graduation purposes. Only passes or course grades accumulated or acquired in USM will be included in the calculation of the Cumulative Grade Point Average (CGPA) for graduation purposes.

2.4.2 Regulations and Implementation of Unit Exemption

Diploma holders from recognised Public and Private Institutions of Higher Learning:

- (i) Unit exemption can only be given to courses taken at diploma level.
- (ii) Courses for unit exemption may be combined (in two or more combinations) in order to obtain exemption of one course at degree level. However if the School would like to approve only one course at the diploma level for unit exemption of one course at degree level, the course at diploma level must be equivalent to the degree course and have the same number of or more units.
- (iii) Courses taken during employment (in service) for diploma holders cannot be considered for unit exemption.
- (iv) The minimum achievement at diploma level that can be considered for unit exemption is a minimum grade 'C' or 2.0 or equivalent.
- (v) The total number of semesters exempted should not exceed two semesters.
- (vi) **In order to obtain unit exemption for industrial training**, a student must have continuous work experience for at least two years in the area. If a student has undergone industrial training

during the period of diploma level study, the student must have work experience for at least one year. The students are also required to produce a report on the level and type of work performed. Industrial training unit exemption cannot be considered for semester exemption as the industrial training is carried out during the long vacation in USM.

(vii) Unit exemption for university and option courses can only be given for courses such as Bahasa Malaysia (LKM400), English Language, Islamic and Asian Civilisations and as well as cocurriculum.

<u>IPTS (Private Institution of Higher Learning) USM Supervised/</u> External Diploma Graduates:

Students who are IPTS USM supervised/external diploma graduates are given unit exemption as stipulated by the specific programme of study. Normally, unit exemption in this category is given as a block according to the agreement between USM (through the School that offers the programme) with the IPTS.

Students from recognised local or foreign IPTA (Public Institutions of Higher Learning)/IPTS who are studying at the Bachelor's Degree level may apply to study in this university and if successful, may be considered for unit exemption, subject to the following conditions:

- (i) Courses taken in the previous IPT are equivalent (at least 50% of the course must be the same) to the courses offered in USM.
- (ii) Students taking courses at Advanced Diploma level in IPT that are recognised to be equivalent to the Bachelor's Degree course in USM may be considered for unit exemption as in Section 2.5.
- (iii) The total maximum unit exemption allowed should not exceed one third of the total unit requirement for graduation.

2.4.3 Total Number of Exempted Semesters

Total Units Exempted	Total Semesters Exempted
8 and below	None
9 - 32	1
33 to 1/3 of the total units for graduation	2

Semester exemption is based on the total units exempted as below:

2.4.4 Application Procedure for Unit Exemption

Any student who would like to apply for unit exemption is required to complete the Unit Exemption Application Form which can be obtained from the Examination and Graduation Section or the respective Schools.

The form must be approved by the Dean of the School prior to submission to the Examination and Graduation Section for consideration and approval.

2.5 Credit Transfer

Credit transfer is defined as the recognition of the total number of credits obtained by USM students taking courses in other IPTAs (Public Institution of Higher Learning) within the period of study at USM, and is combined with credits obtained at USM to fulfil the unit requirements for his/her programme of study. The transferred examination results or grades obtained in courses taken at other IPTAs will be taken into consideration in the Cumulative Grade Point Average (CGPA) calculation.

(a) Category of Students Who Can Be Considered for Credit Transfer

USM full-time Bachelor Degree level students who would like to attend specific Bachelor Degree level courses at other IPTAs.

USM full-time diploma level students who would like to attend specific diploma level courses at other IPTAs.

(b) Specific Conditions

(i) Basic and Core Courses

Credit transfer can only be considered for credits obtained from other courses in other IPTAs that are equivalent (at least 80% of the content is the same) with the courses offered by the programme.

Courses that can be transferred are only courses that have the same number of units or more. For equivalent courses but with less number of units, credit transfers can be approved by combining a few courses. Credits transferred are the same as the course units offered in USM. Average grade of the combined courses will be taken into account in the CGPA calculation.

(ii) Elective or Option Courses

Students may take any appropriate courses in other IPTAs subject to permission from the School as well as the approval of the IPTAs.

The transferred credits are credits obtained from courses at other IPTAs. No course equivalence condition is required.

(iii) Minor Courses

For credit transfer of minor courses, the School should adhere to either conditions (i) or (ii), and take into account the programme requirement.

(c) General Conditions

- 1) The total maximum units transferred should not exceed one third of the total number of units for the programme.
- 2) Credit exemption from other IPTAs can be considered only once for each IPTA.
- 3) The examination results obtained by a student who has taken courses at other IPTAs will be taken into account for graduation purposes. Grades obtained for each course will be combined with the grades obtained at USM for CGPA calculation.
- 4) Students who have applied and are approved for credit transfer are not allowed to cancel the approval after the examination result is obtained.

- 5) Students are required to register for courses at other IPTAs with not less than the total minimum units as well as not exceeding the maximum units as stipulated in their programme of study. However, for specific cases (e.g. students on an extended semester and only require a few units for graduation), the Dean may allow such students to register less than the minimum units and the semester will not be considered for the residential requirement. In this case, the CGPA calculation will be similar to that requirement of the KSCP.
- 6) USM students attending courses at other IPTAs who have failed in any courses will be allowed to re-sit the examinations of the courses if there is such a provision in that IPTA.
- 7) If the method of calculation of examination marks in the other IPTAs is not the same as in USM, grade conversions will be carried out according to the existing scales.
- 8) USM students who have registered for courses at other IPTAs but have decided to return to study in USM must adhere to the existing course registration conditions of USM.

2.5.1 Application Procedure for Attending Courses/Credit Transfer

USM students who would like to apply to attend courses/credit transfer at other IPTAs should apply using the Credit Transfer Application Form.

The application form should be submitted for the Dean's approval for the programme of study at least three months before the application is submitted to other IPTAs for consideration.

2.6 Academic Integrity

"Integrity without knowledge is weak and useless. Knowledge without integrity is dangerous and dreadful." - Samuel Johnson

Academic honesty in academic is important because it is the main pillar in ensuring that manners and ethics with regards to high academic integrity are preserved.

Universiti Sains Malaysia encourages its students to be respectful of and to ensure that any matter relating to academic integrity will be well-preserved. Universiti Sains Malaysia always encourages its students to ensure that manners, ethics and integrity would be essential in academics while focusing on their studies in Universiti Sains Malaysia. These are practices or acts that are considered as conducts which lack integrity in academics:

(a) Cheating

Cheating in the context of academics include copying in examinations, unauthorized use of information or other aids in any academic exercise without authorization or in a non-sincere manner. There are numerous ways and methods of cheating which include:

- Copying answers from others during a test or an exam.
- Any suspicious action that can be described as cheating or an attempt to cheat in an exam.
- Using unauthorized materials or devices without authorization (calculator, PDA, mobile phones, pager, or any smart device, and other unauthorized devices) during a test or an exam.
- Asking or allowing another student to take a test or an exam on behalf and vice-versa.
- Sharing answers or programmes for an assignments or projects.
- Purposely tampering with marked/graded after it has been returned, and then re-submitting it for remarking/regrading.
- Give command, to force, persuade, deceive or blackmail others to conduct research, do writing, programming or any task for personal gain.
- Submitting any identical or similar work in more than one course without consulting or prior permission from the lecturers concerned.
- (b) Plagiarism

The reputation of an academic institution depends on the ability to achieve and sustain academic excellence through the exercise of academic integrity. Academic integrity is based on honesty, trust, fairness, respect, and responsibility, which form the basis of academic work.

One aspect of the loss of academic integrity is due to plagiarism, which is the act of presenting published and unpublished ideas, writings, works or inventions of others in written or other medium, as one's own original intellectual endeavours without any clear acknowledgement of or reference to the author of the source.

A substantial portion of academic work and research are in the written form and the university is committed in the deterrence of plagiarism.

POLICY ON PLAGIARISM OF UNIVERSITI SAINS MALAYSIA

The University Policy on Plagiarism describes USM's strong commitment to uphold academic integrity in relation to plagiarism. It will come into effect when there is an infringement of academic conduct relating to plagiarism.

This policy acts as a guideline that both educates and prevents and can be used as the basis if anyone that is part of the university violates any rules and laws of the University.

The policy applies to all students, former students, staff and former staff which include fellows, post-doctorates, visiting scholars, as well as academic, non-academic, research, contract and temporary staff who study, serving or having served, or have graduated from the University.

Plagiarism is defined as the act of presenting, quoting, copying, paraphrasing or passing off ideas, images, processes, works, data, personal words or those of other people or sources without any proper acknowledgement, reference to or quotation of the original source(s). The acts of plagiarism include, but are not limited to, the following:

- Quoting verbatim (word-for-word replication of) works of other people.
- Paraphrasing another person's work by changing some of the words, or the order of the words, without due acknowledgement of the source(s).
- Submitting another person's work in whole or in part as one's own.
- Auto-plagiarising or self-plagiarism (one's own work or previous work) that has already been submitted previously for assessment, or for any other academic award and admitting it as newly-produced without citing the original content.
- Insufficient or misleading referencing of the source(s) that would enable the reader to check whether any particular work has indeed been cited accurately and/or fairly and thus to identify the original writer's particular contribution in the work submitted.

The University will take action of every report and offences relating to plagiarism and if the student is found guilty, the student can be charged by the university according to the Students Disciplinary Rules.

(c) <u>Fabrication</u>

Fabrication refers to a process of invention, adaptation or copying with the intention of cheating. This is an act of deceiving other people. Fabrication is somewhat related to matters which have been 'created' or altered. Invention or task outcome or academic work without acknowledgement, alteration, falsification or misleading use of data, information or citation in any academic work constitutes fabrication. Fabricated information neither represent the student's own effort nor the truth concerning a particular investigation or study, and thus violating the principle of truth in knowledge. Some examples are:

- Creating or exchanging data or results, or using someone else's results, in an experiment, assignment or research.
- Citing sources that are not actually used or referred to.
- Listing with intent, incorrect or fictitious references.
- Forging signatures of authorization in any academic record or other university documents.
- Developing a set of false data.
- (d) Collusion

Collusion refers to the cooperation in committing or to commit or to do work with negative intentions. Some examples of collusion include:

- Paying, bribing or allowing someone else to do an assignment, test/exam, project or research for you.
- Doing or assisting others in an assignment, test/exam, project or research for something in return.
- Permitting your work to be submitted as the work of others.
- Providing material, information or sources to others knowing that such aids could be used in any dishonest act.
- (e) <u>Other violations relating to academic integrity</u>
 - Arriving late to lecture, tutorial, class or other forms of teaching relating to their courses.
 - Sending or submitting any overdue assignment relating to their courses.
 - Hire someone else to do the assignment or thesis.
 - Carrying out business by providing service to write assignment or thesis of the students.
 - Any other violations that USM considers as violating academic integrity.

2.6.1 Consequences of Violating Academic Integrity

Students are responsible in protecting and upholding academic integrity in USM.

If in any specific event a student or students would encounter any incident that denotes academic dishonesty, the student(s) need to submit a report to the relevant lecturer. The lecturer is then responsible to

investigate and substantiate the violation and report the matter to the Dean of the School.

- (i) If any violation of academic integrity is considered as not of a serious nature, the Dean of the School can take administrative action on the students.
- (ii) However, if the violation is deemed serious by the School, this matter will be brought to the attention of the University Disciplinary Committee for appropriate measures to be taken.
- (iii) If a student is caught copying or cheating in an examination, the Investigation Committee on Copying/Cheating in Examinations will pursue the matter according to the university's procedures. If the investigation found that there is a case, the student(s) will be brought to the Secretariat of University Student Disciplinary Committee (Academic Cases) at Legal Office, Level 2, Building E42, Chancellory II, Universiti Sains Malaysia. Regarding this matter, the Universiti Sains Malaysia (Discipline of Students) Rules will be enforced.
- (iv) Measure 48 Measure Universiti Sains Malaysia (Discipline of Students) Rules provides that a student who had committed an inappropriate conduct and is found guilty could be sentenced with either or a combination of or other suitable penalty as listed:
 - (a) a warning ;
 - (b) a fine not exceeding two hundred ringgit;
 - (c) exclusion from any specific part or parts of the University for a specified period;
 - (d) suspension from being a student of the University for a specified period;
 - (e) expulsion from the University.
- (v) Any student(s) found guilty and is to be suspended from their studies within a given duration by the University Disciplinary Committee (Academic Matters) or the University Disciplinary Committee (General Matters), the maximum suspension period will not be accounted for them in the completion of their studies and while waiting for the verdict to be read.

2.7 USM Mentor Programme

The Mentor Programme acts as a support-aid that involves staff undergoing special training as consultants and guides to the USM community who would like to share their feelings and any psychosocial issues that could affect their social activities. This programme helps individuals to manage psychosocial issues in a more effective manner, which will eventually improve their wellbeing in order to achieve a better quality of life.

Objectives

- (a) To serve as a co-operation and mutual assistance mechanism for dealing with stress, psychosocial problems and many more in order to ensure the well-being of the USM community.
- (b) To inculcate the spirit of unity and the concept of helping one another by appointing a well-trained mentor as a social agent who promotes a caring society for USM.
- (c) To produce more volunteers to assist those who need help.
- (d) To prevent damage in any psychosocial aspect before they reach a critical stage.

2.8 Student Exchange Programme

2.8.1 Study Abroad Scheme

The student exchange programme is an opportunity for USM students to study for one or two semesters abroad at any USM partner institutions. Ideally, students are encouraged to participate in the exchange programme within their third to fifth semester (3 year degree programme) and within the third to seventh semester (4 year degree programme).

USM students who wish to follow the SBLN programme must discuss their academic plans with the Dean or Deputy Dean of their respective Schools and also with the International Mobility & Collaboration Centre (IMCC) (to ensure that credits obtained from the external higher education institution can be transferred as part of the credit accumulation for graduation).

Any student that follows the SBLN programme and violates any disciplinary act in the external higher education institution, can be penalised in accordance with the University (Discipline of Students) Rules if the matter is referred to USM.

For further information, please visit <u>www.imcc.usm.my</u> or contact the International Mobility & Collaboration Centre (IMCC) at +604 - 653 2777/2774.

2.8.2 Student Exchange Programme in Local Higher Education Institutions (RPPIPT)

This is a programme that allows students of Higher Learning Institutions to do an exchange programme for a semester among the higher institutions themselves. Students can choose any relevant courses and apply for credit transfers.

USM students who want to participate in RPPIPT have to discuss their academic plans with the Dean or Deputy Dean of their respective Schools as well with the Academic Collaboration Unit, Division of Academic and International (to ensure that credits obtained from the higher education institution in Malaysia can be transferred as part of the credit accumulation for graduation).

Any student who participates in RPPIPT and violates any of the institution's displinary rules can be penalised according to the University (Discipline of Students) Rules if the matter is referred to USM.

For further information, please visit <u>http://bheaa.usm.my/index.php/programmes/inter-university-exchange</u> or contact the Academic Collaboration Unit of the Academic and International Division at +604 - 653 2451.

2.9 Ownership of Students' Dissertation/Research Project/Theses and University's Intellectual Property

2.9.1 Ownership of Students' Dissertation/Research Project/Theses and University's Intellectual Property

The copyright of a dissertation/research project/thesis belongs to the student. However, as a condition for the conferment of a degree, the student gives this right unconditionally, directly but not exclusively, and free of royalties to the university to use the contents of the work/thesis for teaching, research and promotion purposes. In addition, the student gives non-exclusive rights to the University to keep, use, reproduce, display and distribute copies of the original thesis with the rights to publish for future research and the archives.

3.0 UNIVERSITY REQUIREMENTS

3.1 Summary of University Requirements

Students are required to take 15 - 22 units of the following University/Option courses for University requirements:

	University Requirements	Units
1	Bahasa Malaysia	2
2	English Language	4
3	 <u>Local Students</u> Islamic and Asian Civilisations (TITAS) (2 Units) Ethnic Relations (2 Units) Core Entrepreneurship* (2 Units) 	6
	<u>International Students</u> • Malaysian Studies (4 Units) • Option/ Bahasa Malaysia/ English Language (2 Units)	
4	Co-curricular /Skills Courses/Foreign Language Courses/Options	3 – 12
	 Students have to choose one of the following: Co-curricular** (1-10 units) Skills Courses/ Foreign Language Courses/Options 	
	Total	15 – 22

* Students from Schools which have a similar course as this are exempted from taking this course. The units should be replaced with an option course.

** Students from the School of Educational Studies are required to choose a uniformed body co-curricular package. Registration for co-curricular courses is compulsory for students from the School of Dental Sciences (SDS). The number of co-curricular units that need to be collected is three (3) units. The breakdown is as follows: (i) 2nd year students must register for one (1) unit of the co-curricular course in semester 1. (ii) 3rd year students must register for (1) unit of co-curricular course in semester 1 AND one (1) unit in semester 2 (further information can be obtained from the SDS Academic Office). Registration for co-curricular courses is compulsory for 1st year students from the School of Medical Sciences (SMS). The number of units that need to be collected for co-curricular courses is two (2) units. The breakdown is as follows: 1st year students must register for one (1) unit of a co-curricular course in semester 1 AND one (1) unit of a co-curricular course in semester 1 AND one (1) unit of a co-curricular course in semester 1 AND one (1) unit in semester 2 (further information can be obtained from the SDS.

Details of the University requirements are given in the following sections.

3.2 Bahasa Malaysia

(a) Local Students

The requirements are as follows:

• LKM400/2 - Bahasa Malaysia IV

All Malaysian students must take LKM400 and pass with the minimum of Grade C in order to graduate.

Entry requirements for Bahasa Malaysia are as follows:

No	Qualification	Grade	Level of Entry	Туре	Units	Status
1	 (a) SPM/ MCE/ SC (or equivalent qualification) (b) STPM/ HSC (or equivalent qualification) 	1 - 6 P/ S	LKM400	U	2	Graduation requirement

<u>Note</u>: To obtain credit units for Bahasa Malaysia courses, a minimum grade of C is required. Students may obtain advice from the School of Languages, Literacies and Translation if they have different Bahasa Malaysia qualifications from the above.

- (b) International Students
 - International students pursuing Bachelor's degrees in Science, Accounting, Arts (ELLS), Education (TESL), Housing, Building and Planning and English for Professionals.

All international students in this category are required to take the following courses:

Code	Туре	Units
LKM100	U	2

• International students (non-Indonesian) pursuing Bachelor's degrees in Arts.
All international students in this category are required to take the following courses:

Code	Туре	Units
LKM 100	Z	2
LKM 200	U	2
LKM 300	U	2

• International students (Indonesian) pursuing Bachelor degrees in Arts.

The Bahasa Malaysia graduation requirement for this category of students is as follows:

Code	Туре	Units
LKM200	U	2
LKM300	U	2

Note: Students must pass with a minimum grade C for type U courses.

3.3 English Language

All Bachelor degree students must take 4 units of English Language courses to fulfil the University requirement for graduation.

(a)	Entry	y Rec	uirements	for	English	Langua	ge Courses
~ ~	_						

No.	English Language Qualification	Grade	Level of Entry	Status
1	*MUET LSP401/402/403/4 04 † Discretion of Dean	Band 6 A - C	LHP 451/452/453/454/45 5/ 456/457/458/459	Compulsory/ Option/Type U (2 Units)
2	*MUET LSP300 † Discretion of Dean	Band 5 A - C	LSP 401/402/403/404	Compulsory/ Type U (2 Units)
3	*MUET LMT100 † Discretion of Dean	Band 4 A - C	LSP300	Compulsory/ Type U (2 Units)
4	*MUET † Discretion of Dean	Band 3/2/1 (Score 0 - 179)	LMT100/ Re-sit MUET	Prerequisite/ Type Z (2 Units)

- * MUET: Malaysian University English Test.
- [†] Students may obtain advice from the School of Languages, Literacies and Translation if they have different English Language qualifications from the above.

Note:

- Students are required to accumulate four (4) units of English for graduation.
- In order to obtain units in English Language courses, students have to pass with a minimum grade 'C'.
- Students with a Score of 260 300 (Band 6) in MUET must accumulate the 4 units of English from the courses in the post-advanced level (LHP451/452/453/454/455/456/457/ 458/459*). They can also take foreign language courses to replace their English language units but they must first obtain written consent from the Dean of the School of Languages, Literacies and Translation. (Please use the form that can be obtained from the School of Languages, Literacies and Translation.)
 [*The number of units for LHP457 is 4 and for LHP451, 452, 453, 454,
- 455, 456, 458 and 459 is 2.]
 Students with a score of 179 and below in MUET are required to re-sit MUET to improve their score to Band 4 or take LMT100 and pass with a minimum grade 'C'.

(b) English Language Courses (Compulsory English Language Units)

The English Language courses offered as University courses are as follows:

No	Code/Unit	Course Title	School (If Applicable)
1	LMT100/2	Preparatory English	Students from all Schools
2	LSP300/2	Academic English	Students from all Schools
3	LSP401/2	General English	Students from: School of Educational Studies (Arts) School of Fine Arts School of Humanities School of Social Sciences School of Languages, Literacies and Translation

4	LSP402/2	Scientific and Medical English	Students from: School of Biological Sciences School of Physics School of Chemical Sciences School of Mathematical Sciences School of Industrial Technology School of Educational Studies (Science) School of Medical Sciences School of Health and Dental Sciences School of Pharmaceutical Sciences
5	LSP403/2	Business and Communication English	Students from: School of Management School of Communication
6	LSP404/2	Technical and Engineering English	Students from: School of Computer Sciences School of Housing, Building and Planning School of Engineering
7	LDN 101/2	English For Nursing I	Students from the School of Health Sciences
8	LDN 201/2	English For Nursing II	Students from the School of Health Sciences

3.4 Local Students - Islamic and Asian Civilisations/Ethnic Relations/Core Entrepreneurship

(a) <u>Islamic and Asian Civilisations</u> (The course is conducted in Bahasa Malaysia)

It is compulsory to pass the following course (with a minimum grade 'C'):

HTU 223 - Islamic and Asian Civilisations (TITAS) (2 units)

This course aims to increase students' knowledge on history, principles, values, main aspects of Malay civilization, Islamic civilization and its culture. With academic exposure to cultural issues and civilization in Malaysia, it is hoped that students will be more aware of issues that can

contribute to the cultivation of the culture of respect and harmony among the plural society of Malaysia. Among the topics in this course are Interaction among Various Civilizations, Islamic Civilization, Malay Civilization, Contemporary Challenges faced by the Islamic and Asian Civilizations and Islamic Hadhari Principles.

(b) <u>Ethnic Relations</u> (The course is conducted in Bahasa Malaysia)

It is compulsory to pass the following course (with a minimum grade 'C'):

SHE 101 – Ethnic Relations (2 units)

This course is an introduction to ethnic relations in Malaysia. This course is designed with 3 main objectives: (1) to introduce students to the basic concepts and the practices of social accord in Malaysia, (2) to reinforce basic understanding of challenges and problems in a multi-ethnic society, and (3) to provide an understanding and awareness in managing the complexity of ethnic relations in Malaysia. At the end of this course, it is hoped that students will be able to identify and apply the skills to issues associated with ethnic relations in Malaysia.

(c) <u>Core Entrepreneurship</u> (The course is conducted in Bahasa Malaysia)

It is compulsory to pass the following course (with a minimum grade 'C'):

WUS 101 - Core Entrepreneurship (2 units)

This course aims to provide basic exposure to students in the field of entrepreneurship and business, with emphasis on the implementation of the learning aspects while experiencing the process of executing business projects in campus. The mode of teaching is through interactive lectures, practical, business plan proposals, execution of entrepreneurial projects and report presentations. Practical experiences through hands-on participation of students in business project management will generate interest and provide a clearer picture of the world of entrepreneurship. The main learning outcome is the assimilation of culture and entrepreneurship work ethics in their everyday life. This initiative is made to open the minds and arouse the spirit of entrepreneurship among target groups that possess the potential to become successful entrepreneurs. By exposing all students to entrepreneurial knowledge, it is hoped that it will accelerate the effort to increase the number of middle-class entrepreneurs in the country.

For more information, please refer to the Co-curriculum Programme Reference Book.

3.5 International Students - Malaysian Studies/Option

(a) <u>Malaysian Studies</u>

It is compulsory for all international students to pass the following course (with a minimum grade 'C'): SEA205E - Malaysian Studies (4 Units)

This course investigates the structure of the Malaysian system of government and the major contemporary trends in Malaysia. Emphasis will be given to the current issues in Malaysian politics and the historical and economic developments and trends of the country. The discussion begins with a review of the independence process. This is followed by an analysis of the formation and workings of the major institutions of government - parliament, judiciary, bureaucracy, and the electoral and The scope and extent of Malaysian democracy will be party systems. considered, especially in the light of the current changes and developments in Malaysian politics. The second part of the course focuses on specific issues: ethnic relations, national unity and the national ideology; development and political change; federal-state relations; the role of religion in Malaysian politics; politics and business; Malaysia in the modern world system; civil society; law, justice and order; and directions for the future.

(b) Option/Bahasa Malaysia/English Language (2 Units)

International students need to fulfil another 2 units of an option course or an additional Bahasa Malaysia/English Language course.

3.6 Co-Curriculum/Skills Courses/Foreign Language Courses/Options

Students have to choose one of the following (A/B):

(A) Uniformed/Seni Silat Cekak/Jazz Band Co-curricular Package (6 – 10 Units)

Students who choose to take packaged co-curricular courses are required to complete all levels of the package. It is compulsory for students from the School of Education to choose a uniformed body co-curricular package from the list below (excluding Seni Silat Cekak). The co-curricular packages offered are as follows:

• Palapes (Reserve Officers' Training Corps) Co-curricular Package (10 Units) (3 years)

Palapes Army	Palapes Navy	Palapes Air Force
WTD103/3	WTL103/3	WTU103/3
WTD203/3	WTL203/3	WTU203/3
WTD304/4	WTL304/4	WTU304/4

• Co-curricular Package (6 Units) (3 years)

Suksis (Students' Police Volunteers)	Seni Silat Cekak Malaysia	Jazz Band
WPD101/2	WCC123/2	WCC108/2
WPD201/2	WCC223/2	WCC208/2
WPD301/2	WCC323/2	WCC308/2

Kelanasiswa (Rovers)	Bulan Sabit Merah (Red Crescent)	Ambulans St. John (St. John Ambulance)	SISPA (Civil Defence)
WLK102/2	WBM102/2	WJA102/2	WPA103/2
WLK202/2	WBM202/2	WJA202/2	WPA203/2
WLK302/2	WBM302/2	WJA302/2	WPA303/2

(B) Co-curricular/Skills Courses/Options (1 – 6 Units)

All students are encouraged to follow the co-curricular courses and are given a maximum of 6 units for Community Service, Culture, Sports, Innovation and Initiatives and Leadership (Students from the School of Medical Sciences and School of Dentistry are required to register for a specific number of co-curriculum units and at specific times during their academic year (Please refer to subject 3.1 Summary of University Requirements). Students from the School of Education must take the uniformed co-curricular package [excluding Seni Silat Cekak]. Students who do not enrol for any co-curricular courses or who enrol for only a portion of the 3 units need to replace these units with skills/ option courses. The co-curricular, skills and option courses offered are as follows:

(i) Community Service, Culture, Sports, Innovation and Initiatives and Leadership Co-curricular Courses

Packaged (Students are required to complete all levels)				
Community Service (2 Years)	Jazz Band (3 Years)		Karate (3 Semesters)	Taekwondo (3 Semesters)
WKM101/2	WCC108/2		WSC108/1	WSC115/1
WKM201/2	WCC208/2		WSC208/1	WSC215/1
	WCC308/2		WSC308/1	WSC315/1
	Non-Packaged	(1 Se	emester)	
Culture			Spor	rts
WCC103/1 - Catan (Pair	ting)	WS	WSC105/1 - Bola Tampar (Volley Ball)	
WCC105/1 - Gamelan		WSC106/1 - Golf		
WCC107/1 - Guitar		WS	WSC110/1 - Memanah (Archery)	
WCC109/1 - Koir (Choir)		WSC111/1 - Ping Pong (Table Tennis)		
WCC110/1 - Kraftangan	(Handcrafting)	WS	SC112/1 - Renang	g (Swimming)
WCC115/1 - Tarian Moo (Modern Dan	len ce)	WSC113/1 - Aerobik (Aerobics)		
WCC116/1 - Tarian Tradisional (Traditional Dance)		WSC114/1 - Skuasy (Squash)		
WCC117/1 - Teater Moden (Modern Theatre)		WSC116/1 - Tenis (Tennis)		
WCC118/1 - Wayang Kulit Melayu (Malay Shadow Play)		WS	SC119/1 - Badmi	nton
WCC119/1 - Senaman Qigong Asas (Basic Qigong Exercise)				

Non-Packaged (1 Semester)			
WCC219/1 - Senaman Qigong Pertengahan (Intermediate Qigong Exercise)	WCC124/1 - Sepak Takraw		
WCC124/1 - Kompang Berlagu	WSC 125/1 - Futsal		
WCC122/1 - Seni Memasak (Culinary Arts)	WSC 126/1 - Bola Jaring (Netball)		
WCC127/1 - Kesenian Muzik Nasyid (Nasyid Musical Arts)	WSC 128/1 – Petanque		

	WSC 129/1 - Boling Padang (Lawn Bowl)
Innovation & Initiative	WSC 130/1 - Orienteering
WCC103/1 - Catan (Painting)	Leadership (Kepimpinan)
WCC110/1 - Kraftangan (Handcrafting)	WSC 127/1 - Pengurusan Acara 1 (Event Management 1)
WCC120/1 - Canting Batik (Batik Painting)	WSC 227/1 - Pengurusan Acara 2 (Event Management 2)
WCC121/1 - Seni Khat (Calligraphic Art)	Public Speaking
WCC122/1 - Seni Memasak (Culinary Arts)	WEC 101/1 – Pengucapan Awam
WCC125/1 - Seni Wau Tradisional (Traditional Kite Art)	WEC 101E/1 – Public Speaking
WCC127/1 - Kesenian Muzik Nasyid	WCC 129 – Latin Dance
(Art of Nasheed Music)	(Cha Cha)
WCC128/1 - Seni Sulaman & Manik Labuci (Embroidery & Beads Sequins Art)	
WCC 130/1 - Seni Fotografi SLR Digital (Digital SLR Photography Art)	
WCC/131/1 - Seni Suntingan Fotografi (Editing Photography Art)	
WCC132/1 – Seni Seramik (The Art of Ceramics)	

(ii) WSU 101/2 - Sustainability: Issues, Challenges & Prospect (2 units)

Course Synopsis

This course introduces and exposes students to the concepts of sustainable development. The course is aimed at ensuring that the ability of the next generation to fulfil their needs in the future will not be jeopardized, especially in an era of globalization that is filled with challenges and rapid advances in information technology. Sustainable development by definition, involves efforts to maintain the balance among the three important aspects, i.e. competitive economy, balanced ecosystem and social integration. For the economic aspect, it touches on the issues of development, economic growth, economic challenges of population, agriculture and industrial sector contributions, finance sector, and also information and technology. Environmental sustainability, on the other hand, focuses on forest and environmental management, marine resource management, eco-tourism, environmental degradation, natural phenomena, global warming, and also ethics in natural resource management. The social integration aspect emphasizes the role of the communities in practising sustainable development in daily life with health management, security (climate change, epidemics, crime and terrorism) and socio-economic network. Sustainable development models and case studies will be discussed too.

- (iii) HTV201/2 Teknik Berfikir (Thinking Techniques)
- (iv) Other options/ skills courses as recommended or required by the respective Schools (if any)
- (v) English Language Courses

The following courses may be taken as university courses to fulfil the compulsory English Language requirements (for Band 5 and Band 6 in MUET) or as skills/option courses:

No	Code/Unit	Course Title		
1.	LHP451/2	Effective Reading		
2.	LHP452/2	Business Writing		
3.	LHP453/2	Creative Writing		
4.	LHP454/2	Academic Writing		

No	Code/Unit	Course Title	
5.	LHP455/2	English Pronunciation Skills	
6.	LHP456/2	Spoken English	
7.	LHP457/4	Speech Writing and Public Speaking	
8.	LHP458/2	English for Translation (Offered only in Semester II)	
9.	LHP459/2	English for Interpretation (Offered only in Semester I)	

(vi) Foreign Language Courses

The foreign language courses offered by the School of Languages, Literacies and Translation can be taken by students as an option or compulsory courses to fulfil the number of units required for graduation. Students are not allowed to register for more than one foreign language course per semester. They must complete at least two levels of a foreign language course before they are allowed to register for another foreign language course. However, students are not required to complete all four levels of one particular foreign language course. The foreign language courses offered are as follows:

Arabic	Chinese	Japanese	German	Spanish
LAA100/2	LAC100/2	LAJ100/2	LAG100/2	LAE100/2
LAA200/2	LAC200/2	LAJ200/2	LAG200/2	LAE200/2
LAA300/2	LAC300/2	LAJ300/2	LAG300/2	LAE300/2
LAA400/2	LAC400/2	LAJ400/2	LAG400/2	LAE400/2

French	Thai	Tamil	Korean
LAP100/2	LAS100/2	LAT100/2	LAK100/2
LAP200/2	LAS200/2	LAT200/2	LAK200/2
LAP300/2	LAS300/2	LAT300/2	LAK300/2
LAP400/2	LAS400/2		

4.0 PROGRAMME STRUCTURE/CURRICULUM

4.1 Bachelor of Science (Housing, Building and Planning)

The School of Housing, Building and Planning (HBP) offers a curriculum that is unique amongst programmes of advanced education dealing with the built environment. Whereas curricula in architecture, quantity surveying, engineering or planning are generally based upon a professional training in one of these disciplines, the School eschews professional specialism in favour of a broadly based education cutting across both professional and disciplinary boundaries. As such, it is more correct to describe the broad focus of education at the School as a field of knowledge and skills, rather than the more narrowly focused concept of a single discipline. The students of HBP at the main campus USM and Politeknik Port Dickson (Offshore Programme) therefore draw upon many different disciplines during the course of their studies, in so far as they are all relevant to the activities of housing, building and planning.

Both the structure and content of the School's curriculum reflect the main aim of the School to develop integrative and creative skills across a broad spectrum of knowledge and activities dealing with built environment. The structure of the curriculum is based upon the unit system, whereby the individual student exercises a considerable degree of choice in arranging his/her own programme of studies, so long as he/she satisfies the minimum and maximum requirements for units to be taken in each subject area and course. In addition to the considerable latitude afforded by the unit system, in their second and third year of study, all students will continue to major in one of the offered programmes Architecture, Interior Design, Urban and Regional Planning, Building Technology, Construction Management, Quantity Surveying or Building Surveying.

Studio projects are the keystone of the curriculum providing the essential creative exercises by which all students, no matter their individual programmes, learn to integrate the many diverse skills and forms of knowledge that comprise the total field of housing, building and planning. Studio projects also provide the most important objective test of each student's proficiency and creativity. Further integration is provided by the special treatment given to the teaching of theory and methodology in the School. Rather than treating theory and methodology as separate from each other and from other subjects, the School takes the position that all subjects have a theoretical and a methodology component, to be dealt with as an integral part of each subject area. Both theory and practice are therefore identified in the curriculum as mutually inter-related components, cutting across and occurring at all levels of the curriculum.

These theoretical and practical components are grouped in the curriculum according to the following categories:

- 1. Courses in theory and methodology
- 2. Studio projects
- 3. Laboratory projects
- 4. Practical training
- 5. Research

Appendix A shows the summary of curriculum in the Bachelor of Science (HBP) programme

4.2 Study Path at The School of HBP

The study path of students from undergraduate to postgraduate level at the School of HBP is summarised as below:



4.3 School Requirements

4.3.1 Courses

The requirements for students to at the School of HBP are summarised as follows:

(A) Core Courses

These courses are mandatory for all students and they have to obtain a pass. These courses contain the fundamental topics of the School's curriculum and are coded 'T'.

(B) Elective Courses

Elective courses are alternative courses offered by the School. Students who have chosen to major in one of the programmes, are required to take certain related electives that are classified as priority. When this requirement is satisfied, the student may register for any other electives of their own choice. Code to be used is 'Y'.

(C) Practical Training Course

All B.Sc. (HBP) students are required to undergo Practical Training for a period of 12 weeks during their long term vacation in their second year. Practical training carries 6 units.

Candidates undergoing B.Arch. programme are required to fulfill a practical training requirement of 12 weeks at suitable places during their third year long vacation.

4.3.2 Unit Requirements

Unit requirement for graduation is as follows:-

(A) **Bachelor of Science** (Housing, Building and Planning with Honours) (3 years) (CM, BT, BS and QS)

B.Sc.(HBP) Programme	Units
Core Courses	72
Elective Courses	36
University Courses	19
Total	127

(B) **Bachelor of Science** (Housing, Building and Planning with Honours) (3 years) (Architecture)

B.Sc.(HBP) Programme	Units
Core Courses	90
Elective Courses	18
University Courses	19
Total	127

Bachelor of (Urban & Regional Planning) (4 years)	
Bachelor of Science (Urban & Regional Planning) Programme	Units
Core Courses	86
Elective Courses	36
University Courses	21
Total	143

(D)	Bachelor of Interior Architecture (4 years)			
	Bachelor of Interior Architecture Programme	Units		
	Core Courses	103		
	Elective Courses	21		
	University Courses	19		
	Total	143		

4.4 Course Duration

(A) **Bachelor of Science** (Housing, Building and Planning with Honours) (3 years) (Arch, CM, BT, BS and QS)

Period	B.Sc. (HBP)		
Minimum semesters	6 (3 years)		
Maximum semesters	10 (5 years)		

Bachelor of (Interior Architecture/Urban & Regional Planning) (4 years)

<u> </u>	
B.Sc. (HBP)
8 sem (4 14 sem (4 years) 7 years)
	B.Sc. (1 8 sem (4 14 sem (

For Core and Elective Courses, students obtaining grade F will be required to repeat the course. A grade of D- and above is considered as a passing grade.

For Studio Courses under the Core Courses, a grade of C and above is considered as a passing grade. Students obtaining grade C- and below will be required to repeat the course.

Students awarded with a grade 'C-' and below for a particular course may be given a chance to improve their grades by repeating the course during the KSCP or normal semester. Students awarded with a grade 'C' and above for a particular course will not be allowed to repeat the course whether during KSCP or normal semester.

4.5 Studio Courses

Studio courses are **mandatory** for all students to pass, i.e. with achievements of Grade C and above. Students obtaining Grade C- and below will be required to repeat the course. **CONSTRUCTION MANAGEMENT (42 Units)**

Code	Title
RMS	101/7 - Fundamentals of Construction Project Management Studio
RMS	102/7 - Construction Project Management Competency Studio
RMS	201/7 - Management Studio 1
RMS	202/7 - Management Studio 2
RMS	303/7 - Management Studio 3
RMS	304// - Management Studio 4
BUILI	ING TECHNOLOGY (42 Units)
Code	Title
RES	101/7 - Building Studio 1
RES	1027 - Building Studio 2
RES	2017 - Building Technology Studio 1
RES	2027 - Building Technology Studio 2 2027 - Building Technology Studio 2
RES	505/7 - Building Technology Studio 5
INTE	NOD A DCHITE CTUDE (A2 Unite)
Code	Title
DDC	101/7 Interior Architecture 1
RDS	101/7 - Interior Architecture 1
RDS	2017 - Interior Architecture Studiol
RDS	202/7 - Interior Architecture Studio 2
RDS	301/7 - Interior Architecture Studio 3
RDS	302/7 - Interior Architecture Studio 4
RDS	401/7 - Interior Architecture Studio 5
ARCH	ITECTURE (42 Units)
Code	Title
RAS	101/7 - Design Studio 1
RAS	102/7 - Design Studio 2
RAS	203/7 - Architecture Studio 3
RAS	2047 - Architecture Studio 4
RAS	305/7 - Architecture Studio 3
UDDA	S00/7 - Alchitecture Statuto 4
UKDA	The second
Code	Title
RPS	104/7 - Integrated Studio (Planning)
RP3 DDS	100/7 - Design Studio (Planning) 205/7 - Planning Studio 1
RPS	2067 - Planning Studio 2
RPS	307/ - Planning Studio 3
RPS	308/7 - Planning Studio 4
RPS	409/7 - Planning Studio 5
QUAN	TITY SURVEYING (42 Units)
Code	Title
RQS	101/7 - Quantity Surveying Studio 1
RQS	102/7 - Quantity Surveying Studio 2
RQS	203/7 - Quantity Surveying Studio 3
RQS	2047 - Quantity Surveying Studio 4
RQS	305/7 - Quantity Surveying Studio 5
RUS	S00/7 - Quantity Surveying Studio 6
BUILI	The SURVEYING (42 Units)
Code	101/7 Dividing Studio 1
RES	101// - Building Studio 1 102/7 - Building Studio 2
RBS	203/7 - Building Studio 1
RBS	2047 - Building Surveying Studio 1
RBS	305/7 - Building Surveying Studio 3
RBS	306/7 - Building Surveying Studio 4

4.5.1 Information on Course Code

Each course has a course code, which is made up of 3 alphabets and 3 numbers, as follows:-

R	Α	S	1	2	3
				Cou	rses in Series
				- 00	Studio
				10 -	Workshop/Laboratories
				20 -	Physical Environment Studies
				30 -	Theory and Methodology
				40 -	Cultural & Etiquette Studies
				50 -	Management Administration & Regulation
				60 -	Science and Technology
				70 -	Research and Practical
			Cour	se Lev	el
		Coi	irse Implei	nentat	ion:
		S	= Studio		
		В	= Worksh	iop/Lab	ooratories
		K	= Lecture	only	
		G	= Combin	ation o	of lectures and practicals
		Т	= Combin	ation o	of lectures &tutorial/seminar
		L	= Researc	h	
		Class	-: C 4		
		Cana			
	0 =	- Arch	ita atura		
	A =	= Alcli	n & Dogion	al Dian	ning
	P =	Corra	n & Region	ai Pian	ant
	M =	- Unis	ior Design	magem	ent
	D = E =	- Inter	lor Design	logy	
	E -	- Dunc	ning Technic	ing	
	Q = B =	- Quan	ling Survey	ing ing	
 	D =	- Dunc	ing Survey	mg	
R	- Code for	the Scl	hool of Hou	ısing, I	Building and Planning

4.6 List of Courses

4.6.1 Construction Management Programme

A. Core Courses (72 Units)

Code and T	itle		Unit	Semester	Year
RMS 101	-	Fundamentals of Construction Project	7	1	1
		Management Studio			
RMS 102	-	Construction Project Management	7	2	1
		Competency Studio			
RAG 121	-	Environmental Science I	3	1	1
RAG 132	-	Introduction to Built Environment & Human	3	1	1
		Settlement			
RMK 153	-	Principles of Construction Economics	3	1	1
RMK 156	-	Health, Safety and Environmental	3	2	1
		Management			
RAG 161	-	Building Construction I	3	1	1
REG 163	-	Theory of Structures I	3	2	1
RMS 201	-	Management Studio I	7	1	2
RMS 202	-	Management Studio 2	7	2	2
RMK 231	-	Building and Civil Engineering Quantities	3	1	2
RMK 252	-	Principles of Project Management	3	2	1
RUL 274	-	Compulsory Practical Training	6	2	2
RMS 303	-	Management Studio 3	7	1	3
RMS 304	-	Management Studio 4	7	2	3

B. Elective Courses (36 Units)

Code and T	itle		Unit	Semester	Year
REG 232	-	Land Surveying*	3	1	2
RMK 232	-	Pricing And Estimating*	3	2	2
RMK 254	-	Legal Studies*	3	1	2
REG 261	-	Building Services*	3	2	2
RAG 265	-	Building Construction 2*	3	2	2
RMK 336	-	Valuation*	3	2	3
RMK 353	-	Property Management*	3	1	3
RMK 354	-	Construction Law*	3	2	2
RMK 357	-	Land Administration	3	2	3
REG 360	-	Industrialised Building System (IBS)	3	2	3
REG 361	-	Methods of Construction*	3	1	3
RMK 362	-	Construction and Finance Management 1*	3	1	3
RMK 363	-	Construction Economics*	3	1	2
RMK 364	-	Construction and Finance Management 2*	3	2	3
RBG 351	-	Building Maintenance	3	1	3

4.6.2 Building Technology Programme

Code and T	ïtle		Unit	Semester	Year
RES 101	-	Building Studio I	7	1	1
RES 102	-	Building Studio 2	7	2	1
RAG 161	-	Building Construction I	3	1	1
REG 163	-	Theory of Structures I	3	2	1
RES 201	-	Building Technology Studio I	7	1	2
RES 202	-	Building Technology Studio 2	7	2	2
REG 232	-	Land Surveying	3	1	2
REG 261	-	Building Services	3	2	2
REG 266	-	Theory of Structures II	3	1	2
RUL 274	-	Compulsory Practical Training	6	2	2
RES 303	-	Building Technology Studio 3	7	1	3
RES 304	-	Building Technology Studio 4	7	2	3
REG 361	-	Methods of Construction	3	1	3
REL 370	-	Building Technology Studies	3	2	3
REG 371	-	Design of Stuctures*	3	1	3

A. Core Courses (72 Units)

B. Elective Courses (36 Units)

Code and T	itle		Unit	Semester	Year
RAG 121	-	Environmental Science I*	3	1	1
RAG 132	-	Introduction to Built Environment & Human	3	1	1
		Settlement*			
RMK 153	-	Principles of Construction Economics*	3	1	1
RQG 236	-	Measurement 1*	3	2	2
RQG 237	-	Measurement 2*	3	1	2
REG 265	-	Infrastructure Technology*	3	1	2
RMK 252	-	Principles of Project Management	3	2	1
RMK 231	-	Building & Civil Engineering Quantities	3	1	
RMK 354	-	Construction Law*	3	2	2
REG 360	-	Industrialised Building System(IBS)*	3	2	3
REG 363	-	Site Investigation*	3	1	3
RMK 364	-	Construction and Finance Management 2	3	2	2
REG 368	-	Road and Transportation*	3	1	3
REG 369	-	Steel Structures	3	2	3
REG 370	-	Building Forensic and Maintenance*	3	2	3
RBG 351	-	Building Maintenance*	3	1	3

4.6.3 Quantity Surveying Programme

Code and Title Unit Semester Year Quantity Surveying Studio 1 RQS 101 7 1 1 -ROS 102 Quantity Surveying Studio 2 7 2 1 -ROG 131 -Principles of Quantity Surveying 3 1 1 RAG 161 **Building Construction I** 3 1 1 -7 2 **ROS 203** Quantity Surveying Studio 3 1 _ 7 2 **ROS 204** Quantity Surveying Studio 4 2 -RQG 236 2 Measurement 1 3 1 -2 3 ROG 237 _ Measurement 2 1 2 2 **RUL 274 Compulsory Practical Training** 6 -2 3 RQG 358 **Professional Practice** 3 -3 3 RQG 356 Cost Management -1 3 RQS 305 Quantity Surveying Studio 5 7 1 -3 RQS 306 Quantity Surveying Studio 6 7 2 -3 RQL 371 -**QS** Final Year Project 6 1&2

A. Core Courses (72 Units)

B. Elective Courses (36 Units)

Code and T	itle		Unit	Semester	Year
RAG 121	-	Environmental Science 1*	3	1	1
RAG 132	-	Introduction to Built Environment & Human	3	1	1
		Settlement			
REG 163	-	Theory of Structures 1	3	2	1
RMK 153	-	Principles of Construction Economics*	3	1	1
RMK 156	-	Health, Safety and Environmental	3	2	1
		Management *			
RMK 252	-	Principles of Project Management*	3	2	1
RMK 254	-	Legal Studies*	3	1	2
REG 261	-	Building Services*	3	2	2
RQB 261	-	E-Measurement *	3	2	2
REG 265	-	Infrastructure Technology *	3	1	2
RAG 265	-	Building Construction 2	3	2	2
RMK 362	-	Construction and Finance Management 1*	3	1	2
RMK 354	-	Construction Law*	3	2	2
RQG 355	-	Management, Sustainability and	3	2	3
		Internationalisation*			
REG 361	-	Methods of Construction*	3	1	3

4.6.4 Bachelor of Urban and Regional Planning (4 year program)

Code and Title Unit Semester Year Integrated Studio (Planning) 7 **RPS** 104 -1 1 7 2 **RPS** 106 _ Design Studio (Planning) 1 RPK 131 -Principles of Planning 3 1 1 **RPK 133** Methods of Planning Analysis 3 2 1 Planning Studio 1 7 1 2 **RPS 205** _ Planning Studio 2 7 2 2 **RPS 206** -GIS dan CAD for Planning 3 2 2 **RPG 235** 3 7 1 Planning Studio 3 RPS 307 -7 2 3 Planning Studio 4 **RPS 308** _ 3 Theory and Philosophy of Planning 3 1 RPK 331 3 3 2 Methodology and Techniques of Research **RPK 333** _ 2 3 3 RPK 359 Planning Law -2 Planning Studio 5 7 4 **RPS** 409 2 RPK 439 Professional Practice in Urban Planning 3 4 -2 Urban and Regional Planning Research 4 4 **RPK 472** _ Project RUL 474 **Compulsory Industrial Training** 12 1 4 -

A. Core Courses (86 Units)

B. Elective Courses (36 Units)

Code and T	itle		Unit	Semester	Year
RAG 121	-	Environmental Science 1	3	1	1
RPK 123	-	Planning and Environmental Conversation	3	2	1
RAG 132	-	Introduction to Built Environment and	3	1	1
		Human Settlement			
RPK 221	-	Landscape Planning	3	1	2
RPK 223	-	Tourism Planning and Development	3	2	2
REG 232	-	Land Survey	3	1	2
RPK 232	-	Urban Design	3	2	2
RPK 238	-	Sustainable Development Planning	3	1	2
RPK 334	-	Traffic and Transportation Planning	3	1	3
RMK 336	-	Valuation	3	2	3
RPK 343	-	Social Aspects in Planning	3	2	3
RAK 345	-	Housing Studies	3	2	3
RPK 351	-	Urban and Regional Economics	3	1	3
RMK 357	-	Land Administration	3	2	3
RPK 435	-	Regional and Rural Planning	3	2	4

4.6.5 Interior Architecture

A. Core Courses (103 Units)

Code and Ti	tle		Unit	Semester	Year
RDS 101	-	Interior Architecture 1	7	1	1
RDS 102	-	Interior Architecture 2	7	2	1
RAG 161	-	Building Construction I	3	1	1
RDS 201	-	Interior Architecture Studio 1	7	1	2
RDS 202	-	Interior Architecture Studio 2	7	2	2
RAG 234	-	Computer Aided Design for Architecture	3	1	2
RDG 235	-	Ergonomics	3	1	2
REG 261	-	Building Services	3	2	2
RDB 217	-	Exhibition and Display	3	2	2
RDG 262	-	Interior Architecture Lighting	3	1	2
RDB 263	-	Interior Architecture Detailings and Finishes	3	2	1
RDS 301	-	Interior Architecture Studio 3	7	1	3
RDS 302	-	Interior Architecture Studio 4	7	2	3
RDB 314	-	Design Management	3	2	3
RDG 313	-	Design Workshop	3	1	2
RDG 323	-	Design Presentation Technique	3	2	2
RDG 334	-	Theory and History of Design	3	1	3
RDG 336	-	Professional Practice for Interior	3	2	3
		Architecture			
RDG 366	-	Furniture Design	3	2	3
RUL 474	-	Compulsory Industrial Training	12	1	4
RDS 401	-	Interior Architecture Studio 5	7	2	4
RDL 470	-	Interior Architecture Topical Studies	3	2	4

B. Elective Courses (21 Units)

Code and Title		Unit	Semester	Year	
RMK 153	-	Principles of Construction Economics*	3	1	1
RAG 132	-	Introduction to Built Environment & Human	3	1	1
		Settlement*			
RAG 121	-	Environmental Science 1 *	3	1	1
REG 163	-	Theory of Structures 1	3	2	1
RPK 221	-	Landscape Planning	3	1	2
RAK 232	-	Principles of Architectural Design	3	1	3
RMK 252	-	Principles of Project Management*	3	2	1
RAG 333	-	Advanced Computer Aided Architecture	3	1	3
		Design*			
RPK 333	-	Methodology and Techniques of Research	3	2	3
		*			

4.6.6 Architecture Programme

A. Core Courses (90 Units)

Code and T	itle		Unit	Semester	Year
RAS 101	-	Design Studio I	7	1	1
RAS 102	-	Design Studio 2	7	2	1
RAG 121	-	Environmental Science I	3	1	1
RAG 132	-	Introduction to Built Environment & Human	3	1	1
		Settlement			
RAG 161	-	Building Construction I	3	1	1
REG 163	-	Theory of Structures I	3	2	1
RAS 203	-	Architectural Studio 1	7	1	2
RAS 204	-	Architectural Studio 2	7	2	2
RAG 232		Architectural Working Drawing &	3	2	2
		Documentation			
RAG 234	-	Computer Aided Design for Architecture	3	1	2
RAK 232	-	Principles of Architecture Design	3	1	2
RAG 265	-	Building Construction 2	3	2	2
RUL 274	-	Compulsory Practical Training	6	2	2
RAG 322	-	Environmental Science 2	3	2	3
RAG 333	-	Advanced Computer Aided Architecture	3	1	3
		Design			
RAK 345	-	Housing Studies	3	2	3
RAS 305	-	Architectural Studio 3	7	1	3
RAS 306	-	Architectural Studio 4	7	2	3
RAK 344	-	History and Theory in Architecture 1	3	2	2
RAK 346	-	History and Theory in Architecture 2	3	1	3
RAL 371	-	Measured Drawing	3	1	3

B. Elective Courses (18 Units)

Code and T	itle		Unit	Semester	Year
RMK 153	-	Principles of Construction Economics*	3	1	1
RMK 252	-	Principles of Project Management*	3	2	1
REG 261	-	Building Services*	3	2	2
REG 266	-	Theory of Structures II*	3	1	2
RMK 354	-	Construction Law *	3	2	3
REG 360	-	Industrialised Building System (IBS)*	3	2	3

4.6.7	Building	Surveying	Programme
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Code and T	itle		Unit	Semester	Year
RES 101	-	Building Studio 1	7	1	1
RES 102	-	Building Studio 2	7	2	1
RAG 121	-	Environmental Science I	3	1	1
RAG 161	-	Building Construction I	3	1	1
RMK 153	-	Principles of Construction Economics	3	1	1
REG 163	-	Theory of Structures I	3	2	1
RBS 203	-	Building Surveying Studio 1	7	1	2
RBS 204	-	Building Surveying Studio 2	7	2	2
RBK 231	-	Principle of Building Surveying	3	1	2
RUL 274	-	Compulsory Practical Training	6	2	2
RBS 305	-	Building Surveying Studio 3	7	1	3
RBS 306	-	Building Surveying Studio 4	7	2	3
RBG 351	-	Building Maintenance	3	1	3
RBK 351	-	Professional Practice for Building Surveyor	3	2	3
RBL 371	-	Building Surveying Studies	3	2	3

B. Elective Courses (36 Units)

1
1
1
2
2
2
2
2
2
2
2
3
3
3
3

4.7 Course Synopsis

4.7.1 Commom Studios and Practical Training

RUL 274 – Compulsory Practical Training

This course emphasizes on compulsory practical training to students on matter related to practicing professional in related fields.

Learning Outcomes

At the end of the course students will be able to:

- (i) Identify tasks assign by firm or organization in professional manner
- (ii) Display the ability to solve problems base on working field
- (iii) Solve relevant design issues via teamwork

RUL 474 – Compulsory Practical Training

This course emphasizes on compulsory practical training to students on matter related to practicing professional in related fields.

Learning Outcomes

At the end of the course students will be able to:

- (i) Identify tasks assign by firm or organization in professional manner
- (ii) Display the ability to solve problems base on working field
- (iii) Solve relevant design issues via teamwork

4.7.2 Courses in Construction Management

RMS 101 – Fundamentals of Construction Project Management Studio

This course emphasizes on construction project life cycle and overall physical development processes. It entails development processes and the major players or stakeholders, concept of development appraisal and feasibility including evaluation of land suitable for development, property market, development cost, infrastructural needs, engineering and building services.

Learning outcomes:

At the end of the course, students will be able to:

- (i) Describe the life cycle of construction projects and the processes of physical development.
- (ii) Describes in detail the concept of physical development and evaluation of alternative solutions.
- (iii) Identify appropriate methods for physical development and the appropriateness of ideas towards the preparation of planning to coincide with the needs of the project.
- (iv) Reporting the findings in groups suitable physical development of the proposed location.

References:

- 1. Chadderton, D. V. (2013). Building Services Engineering. Taylor and Francis, UK.
- 2. Havard, T. (2013). *Financial Feasibility Studies for Property Development: Theory and Practice*. Taylor and Francis, UK.
- 3. Jagger, D., Ross, A., Smith, J., & Love, P. (2002). *Building Design Cost Management*. Wiley, UK.
- 4. Millington, A. (2013). *Property Development*. Taylor and Francis, UK.

RMS 102 – Construction Project Management Competency Studio

This course emphasizes the practice of project management competencies that are applied in the development of physical projects. Three main areas of knowledge in construction project management competencies are highlighted, namely technical, general management and psycho-social knowledge areas. In the area of technical knowledge, the concepts of scope management, contractual and legal administration, as well as management of resources in managing projects/physical development are introduced to the students. Within the knowledge area of general management, concepts based on risk management, quality management and productivity are introduced and discussed. Finally, concepts such as stewardship, group and teamwork, as well as ethics and professionalism within the context of psycho-social knowledge areas will be applied via the teaching and learning activities of the course. The deliverables of the physcosocial context are achieved through the implementation of project management competency practices learned by students in contributing towards society via execution of programs involving the Bottom Billion strata of society. These Bottom Billion associated programs will be a meaningful experience for the students in managing actual construction projects that may be more complex in the future without neglecting the needs and demands of marginalized groups within society.

Learning outcomes:

At the end of the course, students will be able to:

- 1. Identify the basic competencies and the professional management of construction projects needed in the management of physical development.
- 2. Explain the basic requirements of construction project management from technical perspective, general management and psycho-social aspect.
- 3. Implement appropriate physical development and meet the requirements, carried out in groups.

References:

- 1. CIOB. (2014). Code of Practice for Project Management for Construction and Development. Wiley, UK.
- 2. Collier, P. (2007). *Bottom Billion*. The Wiley-Blackwell Encyclopedia of Globalization, UK.
- 3. Heagney, J. (2016). *Fundamentals of project management*. AMACOM Div American Mgmt Assn. New York, United States.
- 4. Huth, M. W. (2013). *Understanding Construction Drawings*: Cengage Learning. Clifton Park, United States.
- 5. Lieu, D. K., & Sorby, S. A. (2015). Visualization, Modeling, and Graphics for Engineering Design: Cengage Learning. Clifton Park, United States.
- 6. Madsen, D. A., & Madsen, D. P. (2016). *Engineering Drawing and Design*: Cengage Learning. Clifton Park, United States.
- 7. Maguire, D. E. (2012). *Engineering Drawing from First Principles: Using AutoCAD: Elsevier Science*. Butterworth-Heinemann, UK.
- 8. Turner, R. (2016). *Gower Handbook of ProjectMmanagement*. Routledge. Taylor & Francis, UK.
- 9. Walker, A. (2015). Project Management in Construction: Wiley, UK.

RMK 153 – Principles of Construction Economics

This course emphasizes on market structure, supply and demand in marketing building industry. It introduces the economic concepts; main economic problems; demand, supply and market equilibrium; economic structure; cost and production are also being discussed.

Learning Outcomes

At the end of the course students will be able to:

- (i) Demonstrate the ability to relate economic principles to the construction industry market .
- (ii) Reproduce economic development models based on current situations .

- (iii) Study the problems within the construction industry based on the volatility of the economy system.
- (iv) Report the findings on the relationship between economy and the construction industry.

References:

- 1. Abdullah, F. (2004). Construction Industry and Economic Development : The Malaysia Scene, Penerbit UTM, Johor
- 2. Warren, M (1993). *Economics for the Built Environment*, Butterworth Heinemann, Great Britain
- 3. Ruddock, L. (1992). *Economics for Construction and Property*, Edward Arnold, Great Britain.
- 4. Beardshaw, J. (2001). Economics: A Students Guide, Financial Times Prentice Hall

RMK 156 - Health, Safety and Environmental Management

This course encompasses the identification and control of hazards and management supervision of health, safety and environment in workplace, with an emphasis on the construction industry.

Learning outcomes:

At the end of the course, students will be able to:

- (i) Explain the basic concepts of management of health, safety and the environment within organization.
- (ii) Explain relevant acts applicable in health, safety and the environmental management.
- (iii) Identify risks at construction sites and methods of controlling the risks.

References:

- 1. Department of Occupational Safety and Health (DOSH) (2017). *Guidelines of Occupational Safety and Health in Construction Industry (Management)*. Ministry of Human Resources, Malaysia.
- 2. Holt, A.S.J. and Allen, J. (2015). *Principles of Health and Safety at Work*. Routledge, UK.
- 3. Hughes, P., and Ferrett, E. (2012). *Introduction to Health and Safety at Work* (*Fourth Edition*). Routledge, UK.
- 4. Laws of Malaysia, Act 514 Occupational Safety and Health Act 1994. Malaysia.
- 5. Laws of Malaysia, Factories Machinery Act 1967. Malaysia
- 6. Reese, C.D (2015) Occupational Health and Safety Management: A Practical Approach. CRC Press, Taylor and Francis, UK.

RMS 201 – Management Studio 1

This foundation course is a studio based environment where students will be first introduced to the mainstay of project management which consist of the basic elements of project development. Students will be exposed to the different phases of the construction project as well as key elements of the process of managing projects. The studio will enable students to work within groups and/or individually to get a feel of the actual project team environment. This core subject will also delve into the internal and external factors that weight into project development and how these factors co-exist within the project environment.

Learning Outcomes

At the end of the course students will be able to:

- (i) Discover the basic elements of project management and development
- (ii) Organize the appropriate methods and to determine their suitability within the basic elements of project management and development
- (iii) Propose and present study findings on the basic elements of project management and development
- (iv) Report group study findings on the basic elements within the aspects of project management and development
- (v) Explain, report and evaluate project development processes

References

- 1. Housing Development Act (Revised) 2007
- 2. Uniform Building By-Laws (Revised) 2007
- 3. Laws Relating to Housing & Construction in Malaysia (1998). MDC Publishers
- 4. Kamarudin Mohd. Ali (1993). Tender dan Kontrak Untuk Pembinaan, DBP.
- 5. Ibrahim Wahab (1985). *Garispanduan dan Kriteria Untuk Perancangan*, Penerbit USM.

RMS 202 – Management Studio 2

This is the continuation of the foundation courses where students will be introduced to the costing processes, which consists of the basic elements of costing and estimating. Students will be exposed to the different types of the costing of projects. This course will be organised in two parts. Part One will expose students to the work of quantity surveyor in preparing taking off and bills of quantities. Part Two involves with pricing techniques used by contractors in pricing the tender documents. The studio will enable students to work within groups and/or individually to get a feel of the actual project team environment.

Learning Outcomes

At the end of the course students will be able to:

- (i) Discover estimation concepts as well as preparing construction project development costs
- (ii) Organize the appropriate methods of property development and to determine their suitability towards the preparation of construction project development cost estimates
- (iii) Propose and present study findings on the appropriate cost estimates for the projects studied
- (iv) Report group study findings on the appropriate cost estimates for the case study projects
- (v) Explain, report and evaluate project development processes

References

- 1. Ahamad Abdullah (2006). *Anggaran Kos Kerja Bangunan*. Pearson, Prentice Hall: Malaysia
- 2. Abdullah, A. dan Abdul Rashid, K. (2003). *Pengukuran Kuantiti Bangunan*. Pearson, Prentice Hall: Malaysia
- 3. *Malaysian Standard Method of Measurement of Building Works*. Second Edition (2000). Petaling Jaya: The Institute of Surveyor, Malaysia
- 4. Kamaruddin Mohd Ali (1993). *Tender dan Kontrak untuk Pembinaan*. Dewan Bahasa dan Pustaka, Malaysia

RMK 231 – Building and Civil Engineering Quantities

This course introduces the students to quantity measurement for building and civil engineering works based on SMM2 and CESMM measurement standards.

Learning Outcomes

At the end of the course students will be able to:

- (i) Prepare quantity measurements for buildings and civil engineering works using the standard measurement methods of SMM2 and CESMM
- (ii) Measure each element of building and civil engineering works in detail in order to be able to measure each quantity precisely
- (iii) Share and join other students in collecting the necessary information towards producing quantity measurement works

References:

- 1. The Institution of Surveyors (2000), *Malaysian Standard Method of Measurement of Building Works* 2nd edition, Petaling Jaya: ISM Malaysia.
- 2. CESMM
- 3. Rosli Abd Rashid (1996), *Pengenalan Ukur Kuantiti Binaan*, Kuala Lumpur: Dewan Bahasa dan Pustaka.
- 4. Chudley, R. (1988), Building Construction Handbook, Oxford : Heinemann Newnes
- Snape W.C. (1980), Measurement of Construction Work, 2nd Ed., London: Godwin Limited

RMK 252 – Principles of Project Management

This course discusses on managing the construction industry encompassing the methods of basic planning, monitoring and controlling use in project management.

Learning Outcomes

At the end of the course students will be able to:

- (i) Differentiate the various basic concepts within the aspects of management and organization
- (ii) Manipulate the organizational objectives and structure as well as to identify the organizational environment
- (iii) Explain the psycho-social aspects of management and organization
- (iv) Demonstrate the methods of project management

References

- 1. Levy, Sidney M. (2002). *Project Management in Construction*, 4th Ed. McGraw-Hill Professional
- 2. Hillebrandt, P. and Cannon, J. (1994). *The Management of Construction Firms Aspects of Theory*. The Macmillan Press Ltd.
- 3. Daft, R.K. (1993). Management. 3rd Ed. The Dryden Press
- 4. Helreigel, D., Slocum, W. (1992). *Management*, 6th Ed. Addision-Wesly Pub. Co.

RMK 254 – Legal Studies

In this course, students are exposed to the Malaysian legal system, laws that are relevant to construction projects, criminal law, contract law, company law, partnership law and of torts.

Learning Outcomes

At the end of the course students will be able to:

- (i) Demonstrate the elements of the Malaysian legal system
- (ii) Organize the legal conflicts and problems related to construction projects
- (iii) Demonstrate and apply the relevant legal provisions in the construction process
- (iv) Propose and review the current and most appropriate legal provisions in line with company and partnership laws as well as the Laws of Tort

References

- 1. Abdul Aziz Hussin, (2009). *Pengenalan Kepada Undang-Undang Kontrak*. Edisi Ke-2, Kuala Lumpur : Dewan Bahasa dan Pustaka
- 2. Abdul Rashid Ab. Aziz & Ab. Aziz Hussin, (2000). Aspek Undang-Undang Tort Dalam Projek Pembinaan : Pulau Pinang, Penerbit USM.
- 3. Beatson, J. (1998). *Anson's Law of Contract*, (1998), 27th Edition. Oxford : Oxford University Press.
- 4. Clerk & Lindsell, (1982). *The Law of Torts*. 5th Edition, London: Sweet and Maxwell Limited

RMS 303 – Management Studio 3

An appreciation of the needs of preliminary studies in property development and the integration of multi disciplinary member in the process. Students are required to apply various principle and techniques of quantity surveying, management, economics, facilities management, property valuation and project management in various projects, seminars and case studies. Project given are based on pre-contract and post-occupation periods covering preparation of feasibility studies, market studies, and legal aspects of property development and facility management. Students are introduced to the actual approach of conducting these studies on site.

Learning Outcomes

At the end of the course students will be able to:

- (i) Discover the concepts of property development and management
- (ii) Organize the appropriate property development and management methods as well as to determine their suitability towards preparing an accurate management report
- (iii) Propose and present study findings on suitable property development and management methods based on the sites of the case study projects
- (iv) Report group study findings on the practical property development and management approaches based on the site locations of the projects studied

References

- 1. The Aqua Group (1999). Tenders and Contracts for Building. Blackwell Publishing
- 2. Law Relating to Housing and Construction in Malaysia (1998). MDC Publishers
- 3. Kamarudin Mohd Ali (1993). *Tender dan Kontrak untuk Pembinaan*. Dewan Bahasa dan Pustaka
- 4. Abdul Hakin Mohamad dan Wan Min Wan Mat (1991). *Teknologi Penyenggaraan Bangunan*. Dewan Bahasa dan Pustaka

RMS 304 – Management Studio 4

This studio based foundation course is tailored to enable students to apply their knowledge in a practical approach with focus on property development and management. Students will be required to use actual real life study cases as their references in applying management techniques and tools. Students will also be exposed to the legal aspects of property development as well as financial costing and analysis. The course will also expose students to actual project site planning and organization with emphasis on management and problem solving. Students will also be introduced to project management planning and scheduling software.

Learning Outcomes

At the end of the course students will be able to:

- (i) Discover the practical management concepts and techniques of actual construction projects
- (ii) Organize the appropriate methods and to determine their practical suitability within the management of actual construction projects
- (iii) Propose and present study findings on practical management of actual construction projects
- (iv) Report group study findings on practical management aspects of actual construction projects

References

- 1. The Aqua Group (1999). Tenders and Contracts for Building, Blackwell Publishing
- 2. Laws Relating to Housing & Construction in Malaysia (1998). MDC Publishers
- 3. Abdul Hakim Mohamad & Wan Min Wan Mat (1991). *Teknologi Penyenggaraan Bangunan*, DBP.
- 4. Walker, A. (1989). *Project Management in Construction*, 2nd Edition, BSP Professional Book

RMK 336 – Valuation

This course introduces the students to the basic concept of valuation which covers the concept of value, the economic basis of property valuation, valuation and investment principles and factors affecting property value. Emphasis is given on the five valuation methods and their application to the main types of property and also valuation for legal purposes.

Learning Outcomes

At the end of the course students will be able to:

- (i) Distinguish and explain the factors that influence property value based on the different types of properties
- (ii) Explain the principles and fundamentals related to the field of valuation
- (iii) Demonstrate and explain the use of financial mathematical formulas involved in calculating property values based on specific valuation methods
- (iv) Identify and use the appropriate valuation methods according to the different types and purposes of property valuation

References

- 1. Eldred, G.W. (2002). Value Investing in Real Estate. John Wiley & Sons Ltd.
- 2. Scarrett, Douglas (1991). Property Valuation; the Five Methods. London. E & F.N.
- 3. Spon Isaac, D. and Steley, Terry (1991). Property Valuation Techniques. MacMillan
- 4. Millington, A.F. (1978). An Introduction to Property Valuation. Estate Gazette

RMK 353 – Property Management

This course introduces a diverse range of topics in the property management profession. These include the functions of property management, property market and legislations that influence the profession. Operational aspects like the elements of leasing; acquisition and disposal of property; record keeping and office organisation including the occupant's liabilities and real estate marketing techniques are also introduced. Besides that, the maintenance section offers an impact study of design on future building maintenance, the principle and techniques of its administration and management; maintenance budget; methods of systematic maintenance; maintenance process relating to the various building elements; and innovation in building maintenance management.

Learning Outcomes

At the end of the course students will be able to:

- (i) Distinguish the aspects of the property market as well as the components of property management
- (ii) Study and solve problems relating to the property market and management
- (iii) Explain and elaborate on the findings of property market and management studies
- (iv) Explain the conditions related to property market and management as well as to suggest methods of improvement according to the current needs of the construction scenario

References

- 1. Stapleton, T. (1981), Estate Management, Practice, London: Estates Gazette.
- 2. Thorncroft, M. (1965), Principles of Estate Mangement, London: Estates Gazette.
- 3. Scarrett, D., (1991), Pengurusan Harta, Kuala Lumpur: DBP.
- 4. Gurjit Singh (1996), Property Management in Malaysia, Kuala Lumpur: Times.
- 5. Lee, R., (1987), *Building Maintenance Management*, Oxford: BSP Professional Books.
- 6. Palmer, D. (2006), *Maintenance Planning and Scheduling Handbook*, New York: McGraw-Hill
- 7. Abdul Hakim Mohamad & Wan Min Wan Mat. (1991), *Teknologi Penyenggaraan Bangunan, Kuala Lumpur:*DBP.
- 8. Kelly, A. (2006), Strategic Maintenance Planning, Oxford: Butterworth-Heinemann.

RMK 354 – Construction Law

This course discusses building contracts, professionals, workmen compensation, and arbitration pertaining to property development including planning.

Learning Outcomes

At the end of the course students will be able to:

- (i) Discover the laws pertaining to the construction industry
- (ii) Dismantle the problems for each related law
- (iii) Demonstrate and apply the provisions of law at the work place.
- (iv) Explain and review the suitability of current law provisions

References

- 1. Abdul Aziz Hussin. (2006). *Ahli-ahli Profesional Projek Pembinaan*, Pulau Pinang: Penerbit Universiti Sains Malaysia.
- Abdul Aziz Hussin & Abdul Rashid Abdul Aziz, (2001), Undang-undang Pembinaan – Bon-bon Gerenti Dalam Kontrak Pembinaan, Pulau Pinang: Penerbit Universiti Sains Malaysia
- 3. Abdul Aziz Hussin & Abdul Rashid Abdul Aziz, (2000), *Aspek Undang-undang Tort Dalam Projek Pembinaan*, Pulau Pinang: Penerbit Universiti Sains Malaysia.
- 4. Abdul Aziz Hussin, (1997), *Undang-undang Berkaitan Rahsia Rasmi*, Kuala Lumpur:Dewan Bahasa dan Pustaka.

RMK 357 – Land Administration

This course aims to introduce the students to the current practices of land administration in Malaysia and to give an understanding to them about various issues that are related with land administration especially on its implication to property market and development process.

Learning Outcome:

- (i) Understand issues associated with the land administration system in Malaysia.
- (ii) Explain and discuss the need for effective and efficient land administration systems.
- (iii) Understand and analyse a range of procedures and documentations of the state role over land.
- (iv) Acknowledge and aware of the legal environment affecting land administration.

References

- 1. Jabatan Tanah dan Galian Persekutuan (1980). Buku Panduan Pentadbiran Tanah.
- 2. Ridzuan Awang (1994). *Undang-undang Tanah Islam: Pendekatan Perbandingan*. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- 3. Sihombing, J.E. (1999). *National Land Code: A Commentary*. Singapore/Kuala Lumpur: Malayan Law Journal.
- 4. Salleh Buang (2007). *Malaysian Torrens System*. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- 5. Teo and Khaw (1995). *Land Law in Malaysia; Cases and Commentary*. 2nd Edition. Malaysia: Butterworth.

RMK 362 – Construction and Finance Management 1

This course introduces the students to the importance and methods of financial analysis in construction. This subject emphasizes on the fundamentals and application of financial management in construction. Students are also exposed to the elements of accounting systems and financial statements as well as the available banking facilities in the market.

Learning Outcomes

At the end of the course students will be able to:

- (i) Analyze the importance of financial analysis.
- (ii) Organize the implementation of analytical methods of financial management in the construction industry
- (iii) Report the findings of financial analysis within an actual construction industry environment.

References

- 1. Moyer, R.C., McGuigan, J.R. and Rao, R.P. (2007). *Fundamental of Contemporary Financial Management*. Eagan, Minn: Thomson/ South-Western.
- 2. Peterson, S.J. (2005). *Construction Accounting and Financial Management*. Upper Saddle River. New Jersey. Prentice Hall.
- 3. Lasher, W.R. (2003). *Practical Financial Management*. 3rd Edition. Thomson, South-Western,
- 4. Frank, J. Fabozzi & Pamela P. Peterson (2003). *Financial Management & Analysis*. Upper Saddle River. New Jersey: Prentice Hall.

RMK 363 – Construction Economics

This course encompasses cost estimation, control and management in the design and construction process.

Learning Outcomes

At the end of the course students will be able to:

- (i) Point out the importance of the construction industry as well as its related processes
- (ii) Organize the theories and principles practised by all professionals within the construction industry in relation to construction economics
- (iii) Study and compare between the different techniques practised in construction economics)
- (iv) Demonstrate the aspects of construction project economic viability/feasibility

References

- 1. Ferry, D.J. et.al (1999). Cost Planning of Buildings (7th Edition), Blackwell Science.
- 2. Seeley, Ivor H (1996). *Building Economies* (4th Edition), MacMillan.
- 3. Ashworth Allan (1994). Cost Studies of Building (2nd Edition), Longman
- 4. Brandon, P.S. et. al (1992). *Quantity Surveying Techniques New Directions*, Blackwell Science.

RMK 364 – Construction and Finance Management 2

This course is a continuation of the previous semester's subject on construction management and finance. The main objective of this subject is to make students understand the impact of finance in construction. Basically this subject is divided into two main sections; which are: 1) Issues relating to organisation, contractual, administration, procurement methods and tendering, project planning and controlling, site management and communication; 2) Issues related to finance in construction management.

Learning Outcomes

At the end of the course students will be able to:

- (i) Classify the importance of construction and financial management.
- (ii) Organize the implementation of construction and financial management methods within the construction industry
- (iii) Report the findings of the analysis on construction and financial management within the context of the actual construction industry environment.
- (iv) Identify business potentials within construction projects and organizations.
- 1. Asry Yusof (1996). Memahami Asas Kewangan. Dewan Bahasa dan Pustaka
- 2. B.C. Ghosh (1990). Finance for Managers. Pelanduk Publication
- 3. Mott, Charles H. (1981). *Accounting and Financial Management for Construction*. Willey Interscience Series on Construction Management. John Willey and Sons
- 4. D.J. Leech (1982). *Economics & Financial Studies for Engineers*. Ellis Horwood Publisher
- 5. Abdul Rashid Abdul Aziz & Abdul Aziz Hussin (1999). Pengurusan Projek: Perspektif Industri Pembinaan.Penerbit USM
- 6. Abdul Hakim Mohamed & Ishamuddin Ahmad (1995). *Pengurusan Projek Binaan*. Dewan Bahasa dan Pustaka
- 7. Rusdi Mustafa (1992). Pengurusan Projek Pembinaan. Dewan Bahasa dan Pustaka

4.7.3 Courses in Building Technology

RES 101 – Building Studio 1

This course exposes students to the basic understanding of the role and contribution of various disciplines in the built environment. Students will be trained in all basic aspects of drawing, sketches, materials, building elements and building structures. Furthermore, this course will develop the creativity, communication skill and perception though development process that involves with site analysis, site planning, measured drawing, specification and detailing.

Learning Outcomes

At the end of the course students will be able to:

- (i) Explore and identify the roles of the actors in the built environment
- (ii) Identify the flow of development process flow
- (iii) Explain and apply basic technical drawing
- (iv) Explain the use of materials and building components, structural elements, building infrastructure and services

References

- 1. Francis D. K. Ching (2014), Building Construction Illustrated Paperback, John Wiley & Sons, Inc.
- Colin H. Simmons (2012), Manual of Engineering Drawing: Technical Product Specification and Documentation to British and International Standards, Butterwork Heinemman
- 3. Varghese, P.C (2010), Building Materials, PHI Learning Private Limeted, Delhi
- 4. Ching, F. D. K. (2010) Design Drawing 2nd Ed. New York: John Wiley & Sons, Inc.
- Ching, F. D. K. (2014) Building Construction Illustrated. 5th Ed. New York: John Wiley & Sons, Inc.

RES 102 – Building Studio 2

The overall objective of the course is to introduce students to the fundamental concepts, techniques and framework for the evaluation of development projects. This course will provide an understanding on process of property development such as market study, demand and supply analysis, site appraisal, analysis of project master plan, analogous cost estimation, site coordination and management as well as building and engineering plans approval.

Learning Outcomes

At the end of the course students will be able to:

- (i) Identify the main components of the project development process
- (ii) Carry out market study and site analysis in a group
- (iii) Propose concept and master plans in line with the requirements of the project
- (iv) Comprehend the main components of site coordination and management
- (v) Demonstrate the skills to interact and work as a team

References:

- 1. Rodney, O. (2007), Feasibility Studies Made Simple, Martin Books Pty Ltd
- 2. Kibert, C. (2012), *Sustainable Construction : Green Building Design and Delivery*, 3rd Edition, Wiley-Blackwell
- 3. Robinson, H., Symonds, B., Gilbertson, B. and Ilozor, B. (2015), *Design Economics* for the Built Environment: Impact of Sustainability on Project Evaluation. Wiley-Blackwell
- 4. Ching, F.D.K (2011), Building Construction Illustrated. Wiley-Blackwell
- 5. Awang, H., Othuman Mydin, M.A. (2016), *Construction Methods and Technology*, Penerbit USM.
- 6. Peurifot, R.L. et al. (1996). *Construction Planning, Equipment and Methods*. McGraw Hill.
- 7. Mastura, J. (2009), Panduan dan Prosedur Asas Cadangan Pembangunan Projek Perumahan
- 8. Mustafa, M. (2011), *Environmental Law in Malaysia*. Wolters Kluwer Law and Bussiness
- 9. Hall, F. (1994), *Building Services and Equipment*: Volume 1 (3rd Edition).

REG 163 – Theory of Structures I

This course comprise of the introduction of basic foundation of statics including concept of forces, distribution of forces, direct forces, moments, combination forces, polygons and triangular forces and equilibrium forces. This course also focuses on building frame structures, trusses using methods of force distribution, etc, in determining shear force, bending moments and deflection of static structure.

Learning Outcomes

At the end of the course students will be able to:

- (i) Identify the engineering properties of structure in critical way.
- (ii) Calibrate the method of solutions for structure and concepts of bending moment and shear force in beam.
- (iii) Study collectively about the forces in framework, stress in structure and methods of solution.

- 1. Morgan, W., Williams, D., Durka, F. & Al Nageim, H. (2002). *Structural Mechanics: Loads, Analysis, Design and Materials*. Prentice Hall.
- 2. Smith, P. (2001). An Introduction to Structural Mechanics. Palgrave Macmillan.
- 3. Hulse, R. & Cain. J. (2000). Structural Mechanics. Palgrave Macmillan.
- 4. Morgan, W. (1996). *Elements of Structures*, Edited by Burke, I.G. Pitmann.

RES 201 - Building Technology Studio 1

This course emphasizes on laboratory and site tests. Students will be exposed to the knowledge of soil mechanics, building materials, structural testing, analysis and design of structures. Students will also be exposed to technical report preparation.

Learning Outcomes

At the end of the course students will be able to:

- (i) Explain the characteristics of soil, building material and structure analysis for building construction requirements and problem solving.
- (ii) Conduct different types of soil test, building material, structure test and correlate with the construction.
- (iii) Identify and study test result and prepare technical report according to the requirements of related parties.

References

- 1. Morgan, W. and buckle, I.G. (1987). *Elements of Structure: An Introduction to the Principles of Building and Structural Engineering*. Longman
- 2. Neville, A.M. (1997). Properties of Concrete, 4th Edition. Prentice Hall
- 3. Mahyuddin Ramli (1992). *Pengujian Bahan dan Struktur*. Dewan Bahasa dan Pustaka.
- 4. Smith, G.N. (1982). *Elements of Soil Mechanics for Civil and Mining Engineers*. Granada
- 5. Vichers, B. (1983). *Laboratory Work in Soil Mechanics*, 2nd Edition. Granada Primavera

RES 202 - Building Technology Studio 2

This studio course emphasizes on building services, building science, building defects and indoor environment of buildings. Students will be exposed to the analysis of the impact of technology on environment during project planning or after implementation.

Learning Outcomes

At the end of the course students will be able to:

- (i) Elaborate the procedure and building services documents, building science, defects and the surroundings in building construction professionally.
- (ii) Sketch different types of building system in constructing building and solve any problem within teamwork.
- (iii) Differentiate and explain building services problems and defects towards the surroundings.

- 1. Hall, F. & Greeno, R. (2005). *Building Services Handbook*, 3rd Edition. Elsevier Butterworth-Heinemann
- 2. Chadderton, D.V. (2000). *Building Services Engineering*, 4th Edittion, E&FN Spon.

- 3. Wise, A.F.E. & Swaffield, J.A. (2002). *Water, Sanitary & Water Services for Building*, 5th Edition, Butterworth-Heinemann.
- 4. Cowan, H.J & Smith, P.R. (1983). *Environmental System*, Van Nostrand Reinhold International
- 5. Greeno, R. (1997). Building Services Technology and Design. Longman
- 6. Uniform Building By-Laws Malaysia (1984)

REG 232 – Land Surveying

This course covers the basic principles of surveying works including exploratory survey, level survey, traverse survey, theodolite survey, compass survey and tacheometric survey. Contour survey, contour development, determination of volumes in cut and fill works and also construction site survey will also be covered. Besides, introduction to GPS, control dan monitoring survey dan latest technology will also be introduced.

Learning Outcomes

At the end of the course students will be able to

- (i) Apply the basic principles of land survey.
- (ii) Analyze data and prepare land survey report.
- (iii) Determine the problems that exist in building engineering.
- (iv) Explain problems related to soil engineering and construction.

References

- 1. Bannister, A., Raymond, S. & Baker, R. (1998). Surveying. 7th Edition, Longman
- 2. Irvine, W. (1995). Surveying for Construction. 4th Edition, McGraw-Hill, London
- 3. Bannister, A.& Baker, R. (1995). *Surveying*. Longman Scientific & Technical
- 4. Wilson, R.J.P (1983). Land Surveying. McDonalds & Evans

REG 261 - Building Services

This course focuses on the efficiency of building services and the systems involved. The building services that are mainly highlighted in this course are lighting, heating and ventilating, air conditioning, security and alarm systems and fire detection and protection. Students will be exposed to the principles, components and knowledge to design an appropriate building service system for different types of buildings such as residential,offices and multi-storey buildings.

Learning Outcomes

At the end of the course students will be able to:

- (i) Elaborate every principles of basic building services component.
- (ii) Display the ability of analyzing and preparing building services in a teamwork.
- (iii) Propose teories and techniques in designing building services systems.

References

- 1. Hall, F. & Greeno, R. (2005). *Building Services Handbook*, 3rd Edition. Elsevier Butterworth-Heinemann
- 2. Wise, A.F.E. & Swaffield, J.A. (2002). *Water, Sanitary Waste Services for Building*. 5th Edition. Butterworth-Heinemann
- 3. Chadderton; D.V. (2000). Building Services Engineering. 4th Edition. E & FN Spon
- 4. Greeno, R. (1997). Building Services Technology and Design. Longman

REG 265 – Infrastructure Technology

This course focuses on the components of physical infrastructures that support the development of a nation. The examples of physical infrastructures are roads, power supplies, drainage and sewerage system. Students will be exposed to the principles, components and the knowledge to design the infrastructure system. This course also discusses the technology being applied to develop such infrastructure for the country by providing actual examples from the existing infrastructure and mega infrastructure projects in this country and overseas.

Learning Outcomes

At the end of the course students will be able to:

- (i) Explain the principles of each components of basic facilities needed for development.
- (ii) Manipulate the theories and techniques in designing the infrastructure system.
- (iii) Shape the infrastructure component and practice work professionally.

References

- 1. Lay, M.G. (2009). Handbook of Road Technology. 4th Edition. Spon Press
- 2. Chudley, R. & Greeno, R. (2005). *Construction Technology*. 4th Edition. Prentice Hall.
- 3. Geyer, F. & Okun (2004). Water & Waste Water Engineering. John Wiley
- 4. Garber, J.G. & Hoel, L.A. (2001). *Traffic and Highway Engineering*. CL Engineering

REG 266 – Theory of Structures II

This course focuses on the loading of structures and the relationship between stressstrain. Various types of loads and load-static, resultant force, moment and reaction theories will be discussed. Students will be exposed to analysis of beam reaction, shear and moment diagrams. Composite columns and beams analysis will also be covered. It also emphasized on the strength of materials in structures, analysis of determinate and indeterminate structures. Students are required to carry out laboratory experiments in addition to assignments and lectures.

Learning Outcomes

At the end of the course students will be able to:

- (i) Identify critically determinate and undeterminates structure and their characteristics.
- (ii) Unveil the concept of bending moment distribution and shear force, and also structure solving techniques.
- (iii) Study the material strength and building structure and also problem solving method professionally.

References

- 1. Morgan, W., Williams, D., Durka, F. & Al Nageim, H. (2002). *Structural Mechanics: Loads, Analysis, Design and Materials*. Prentice Hall
- 2. Bhatt, P. and Nelson, H.M. (1990). Marshall & Nelson's Structures. Longman
- 3. Morgan, W. and Buckle, I.G. (1987). *Elements of Structure: An Introduction to the Principles of Building and Structural Engineering*. Longman
- 4. Mosely, W. H., Bungey, J.H. and Hulse, R. (1999). *Reinforced Concrete Design*, 5th Edition. Palgrave Macmillan

RES303- Building Technology Studio 3

This is the first part of final year Building Technology studio. It will focus on the practical aspect of land and project development. It covers three (3) main approach namely training and workshop on planning and design of land development project, Next is exposure to common infrastructure provisions in land development and finally studies of building and infrastructure safety and security

Learning Outcomes

At the end of the course students will be able to:

- (i) Identify the difference of planning concept, design of land development approval process, in addition to imparting awareness on the role of component group in project construction.
- (ii) Elaborate and explain the needs of mechanical and electrical requirement and identify problems in building construction.
- (iii) Sketch water supply system and practical aspects in sanitary and sewerage construction based on the requirements of the authority and entrepreneuriaship orientatation.
- (iv) Elaborate and solve problems in land development through effective and professional leadership.

- 1. Sadgrove, B.M. (1993). Setting Out Procedures. CIRIA. Butterworth-Heinemann
- 2. Dowberry and Davis (1996). Land Development Handbook. McGrawHill
- 3. Colley, B.C. (1993). Practical Manual of Land Development. McGraw-Hill.

RES 304- Building Technology Studio 4

This course emphasizes on construction management and the process, taking off the quantity and costing and measurement of the quality of a workmanship of a construction base on the relevant approved standard. This course also focuses on the design of reinforced building structures both manually and using computer software.

Learning Outcomes

At the end of the course students will be able to:

- (i) Elaborate the steps in construction management and documentation effectively.
- (ii) Summarize the building structure design concept both manually and using computer software.
- (iii) Detail the building structure design based the current standard requirements.
- (iv) Plan and prepare quantity of working drawing and estimate the cost of the projects, and also solve cost estimation problem ethically .

References

- 1. Mosley, W.H., Bungey, J.H. & Hulse, R. (1997). *Reinforced Concrete Design*. 5th Edition. Palgrave Macmillan
- 2. Kong, F.K., Evans R.H., Cohen, E. & Roll, F. (1983). Handbook of Structural Concrete.Pitman.
- 3. Macginley, T.J. & Choo, B.S. (1990). *Reinforced Concrete: Design Theory and Examples*. E & FN Spon

REG 360 – Industrialised Building System (IBS)

The course introduces the concept of IBS as a sustainable construction in Malaysia. A comparative study of conventional and IBS building process and construction shall be introduced. Various IBS materials, technologies, financial and economic aspects will also be discussed in the course. Aspects of Modular coordination, Modular Design Rules and Structural Design concepts using components and assemblies will be introduced. Project management principles are also applied to IBS. Case study and site visits will be organised.

Learning Outcomes

At the end of the course students will be able to:

- (i) Explain the concept of IBS in building construction.
- (ii) Explain with figure the design concepts of IBS and modular coordination in building construction.
- (iii) Demonstrate the skills in applying financial and economic application of IBS.
- (iv) Elaborate and show the calculation of IBS Score.

- 1. Trikha & Abang Ali (2004). Industrialised Building Systems, UPM Press and CIDB
- 2. CIDB (2000). Modular Design Guide. CIDB Malaysia
- 3. Christian Meyer (1995). The Design of Building Structures. Prentice Hall.
- 4. CIDB (1999). Structural Precast Concrete Handbook. CIDB Malaysia

REG 361 - Methods of Construction

This course prepares students with the knowledge on the process and methods of construction. Students are given practical exposure on site management, earth work including cleaning, cut and fill, dewatering process from the construction site. They are also exposed to the basic design and preparation of concrete construction and removal of formwork for the prefabricated construction system, pre-stressed concrete construction and high rise construction

Learning Outcomes

At the end of the course students will be able to:

- (i) Identify construction characteristics and methods critically.
- (ii) Explain graphically the construction method and building material used in construction.
- (iii) Unveil and suggest the latest and suitable methods use in current construction industry.

References

- 1. Tomlinson, M.J. (2007). *Foundation Design and Construction*. Viewpoint Publication, London.
- 2. Mahyuddin Ramli and Noor Faisal Abas (2006). *Construction Technology in Developing Countries*. Universiti Sains Malaysia Press, P. Pinang
- 3. Neville, A.M. (1997). *Properties of Concrete*. 4th Edition Prentice Hall
- 4. Peurifot, R.L. et al. (1996). *Construction Planning, Equipment and Methods*. McGraw Hill

REG 363 – Site Investigation

This course encompasses soil suitability research theoretically and practically, requirements for stability and foundation types. Students will learn how to carry out analysis and how to implement basic foundation design by doing laboratory testing and site testing. This will ensure a safe foundation for building construction.

Learning Outcomes

At the end of the course students will be able to:

- (i) Elaborate soil suitability and carry out laboratory site investogations in group.
- (ii) Measure soil engineering properties and building and infrastructure stability.
- (iii) Propose the current design which is suitable with the site and its importance in building construction planning.

- 1. Mahyuddin Ramli (1992). Pengujian Bahan dan Struktur. Dewan Bahasa dan Pustaka
- 2. Meor Othman Hamzah and Mahyuddin Ramli (1992). Asas Mekanik Tanah. Universiti Sains Malaysia
- 3. Vichers, B. (1983). Laboratory Work in Soil Mechanics. 2nd Edition. Granada
- 4. Craigh, R.F. (1983). Soil Mechnaics. 3rd Edition. Van Nostrand Reinhold

REG 368 – Road and Transportation

This course comprises of the planning of road and transport system (Introduction to road category and hierarchy, road and land transport administration in Malaysia, road in land and development projects, route reserve, slope reserve and land acquisition); fundamentals of land transport planning (facilities design – other modes); road and transport system design (design standards and code, calculation of horizontal and vertical alignment, pavement design especially flexible pavement). The construction and technology including earthworks, slope and soil stabilization, hydraulics structures and calculations, traffic control devices and systems are also will be introduced. The material in road construction such as soil, aggregates, concrete, asphalt are also will be included.

Learning Outcomes

At the end of the course students will be able to:

- (i) Relate road administration category and land transport system with related rights and design work flowchart, site construction administration and roles played by various paties during construction.
- (ii) Identify the properties and uses of materials in road construction.
- (iii) Organize system, machinery and road construction technology and related land transportation system.
- (iv) Study the traffic growth, demonstrate the design of road geometry, road pavement and land transportation system.

References

- 1. Derucher, K.N., Korfiatis, G.P. and Ezeldin, A.S. (1998). *Materials for Civil and Highway Engineers*. 4th Ed. Prentice Hall
- 2. JKR Malaysia. Arahan-arahan Teknik Jalan
- 3. Colley, B.C. (1993). Practical Manual of Land Development. McGraw-Hill.
- 4. Ghani, A.N.A. (2009). Perancangan, Rekabentuk dan Pembinaan Jalan dan Lebuhraya. Modul/Text REG 366.

REG 369 – Steel Structure

The subject offers studies into the - steel structures, structural elements, structural design, design methods, design calculation, steel as construction materials-design considerations, steel section, steel properties, the basic of structural design limit state design principles, serviceability limit states, design of material strength, joint-basic concepts (connections)-types of connections, ordinary bolts, welded connections, further consideration in design of connections. Students are also exposed to axially loaded column-loads on compression members, classification of cross section, axially loaded compression member, beams- beam loads, classification of beam cross-sections, bending stresses and moment capacity, deflection of beams, beam connections, structural behavior of tension members, design of tension member.

Learning Outcomes

At the end of the course students will be able to:

- (i) Identify the characteristics of material, behavior and concepts of steel structure design.
- (ii) Unveil the behavior of the steel structure.
- (iii) Select the fabrication method, joint technique and installation procedure of steel structure.
- (iv) Solve the design of steel structure components and joints based on BS 5950 in hte most economic manner.

References

- 1. MacGinley, T.J (1988) Structural Steel work : design to limit state. Butterworth
- 2. British Standard 5950 (1997) British Standard Institute
- 3. David A. Nethercot, (2001) Limit States Design of Structural Steelwork. Spon Press
- 4. Peter Knowles (1987), Design of Steel Structuralwork. Surrey University Press

REG 370 – Building Forensic and Maintenance

This course covers on the introduction to building technology appraisal and its uses with reference to the building maintenance technology and building pathology performance. Building maintenance technology can be broadly defined as the application of scientific principles to the care and preservation of built asset. More specifically it incorporates the skills and knowledge attained through training, education and experience to inspect, manage, maintenance, clean, renovate, retrofit and restore buildings. Building pathology dealing with specific diagnosis, prognosis and repair issues associated with buildings and structures also will be discussed. It is embraces a holistic approach to the repair of building and structures. This involves a detailed understanding of how the structure is built, the materials of which it is constructed, how it has been used, how it has performed over time, and all the factors that have affected its current condition.

Learning Outcomes

At the end of the course students will be able to:

- (i) Analyze the building maintenance technology, building pathology, characteristics of building pathology and the tests involve.
- (ii) Check building defects and damages, give information on repair techniques, and discuss maintenance problems with the monitoring on the cost and sustainability continuously.
- (iii) Unveil and demonstrate building damage diagnosis methods professionally, taking into consideration the sensitivity of the society.

- 1. James Douglas & Bill Ransom (2007). *Understanding Building Failures*. Taylor & Francis
- 2. Susan Macdonald (2003). *Concrete Building Pathology*. Blackwell Publishing
- 3. Dobrawolski, J.A. (1998). Concrete Construction Handbook. ^{4th} Edition. McGraw Hill

- 4. Clive Briffett (1995). *Building Maintenance Technology in Tropical Climates*. Singapore University Press
- 5. Lee How Son & George C.S. Yuen (1993). *Building Maintenance Technology*. The Macmillan Press Ltd
- 6. Derek Miles & Paul Syagga (1987). *Building Maintenance A management manual*. Intermediate Technology Publication
- 7. Peter Harlow (1984). *Managing Building Maintenance*. The Chartered Institute of Building

REL 370 – Building Technology Studies

This course can help and guide students to prepare dissertation through the right research approach. Systematic and scientific research approach will be exposed to student based on following courses.

Learning Outcomes

At the end of the course students will be able to:

- (i) Explore the reading from building technology and construction field to generate research problem.
- (ii) Generate problems related to issues in building construction, and explore problem solving techniques to produce structured and systematic writings.
- (iii) Adapt research findings, measure performance and suggest solutions to research problem.
- (iv) Elaborate, recommend and present research findings in writing and verbal forms, that are relevant to the building technology.

References

- 1. Sharp, J.A. and Howard, K. (1996) *The Management of a Student Research Project*. Gower Publishing Ltd. Hants, England
- 2. Tan, W. (2001) Practical Research Methods. Practice Hall, Singapore
- 3. Salkind, N.J. (2003) Exploring Research. Person Education Inc., New Jersey, USA.
- 4. Glaser, B. (1992) *Basics of Grounded Theory Analysis: Emergence Versus*. Sociology Press, California, USA
- 5. Strauss, A. and Corbin, J (1998) *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. SAGE Publications Inc. California, USA.

REG 371 – Design of Structures

This is an introductory course to structural design and will cover major area of reinforced concrete design. Its includes structural components such as beams, columns and footings using the ultimate limit state design; serviceability limit state, application of building code of practice, BS 8110. Besides the RC design, the following topics of steel/timber will be outlined i.e. steel/timber grades, mechanical properties of steel/timber, steel/timber behavior in bending and compression members and steel/timber connector. Relevant code of practices for steel and timber are also highlighted.

Learning outcomes

At the end of the course the student will be able to:

- (i) Explain the behavior and characteristic of concrete, steel/timber
- (ii) Explain the basic concept of limit state design and its application in reinforced concrete, steel/timber
- (iii) Understand the serviceability of reinforced concrete and steel/timber structures
- (iv) Understand the method of RC design using the building code of practice

- 1. British Standard Institute (1997), Code of Practice for design and Construction of RC structures
- 2. British Standard Institute (2000), *Steelwork design guide*
- 3. Mosley, W.H., Bungey, J.H. & Hulse, R (1997), *Reinforced concrete design*, 5th edition, Palgrave Macmillan
- 4. Allen, A.H. (1988), Reinforced *concrete design to BS8110: simply explained*, Spoon Press
- 5. Nethercot, D.A (1992). Limit Design of Structural Steelwork, Van Nostrand Reinhold
- 6. Mat Lazim Zakaria (1992). *Rekabentuk struktur kayu menurut MS544*, Dewan Bahasa dan Pustaka.

4.7.4 Courses in Quantity Surveying

RQS 101 – Quantity Surveying Studio 1

This course introduces the entire property development proses, actors of the built environment, Technical drawing skills are also taught and understanding of building elements as well as creativity in model making is encouraged.

References

- 1. Lee, S., Trench, W. And Willis, A. (2014), Willis's Elements of Quantity Surveying, 12th Edition, Wiley-Blackwell, London
- Chudley R. And Greeno R. (2016), Building Construction Handbook. Taylor & Francis Ltd, New York
- 3. Huth, M.W. (2013), Understanding Construction Drawings. Delmar Cengage Learning, New York
- 4. Ching, F.D.K (2011), Building Construction Illustrated. Wiley-Blackwell, London
- 5. Mastura, J. (2009), Panduan dan Prosedur Asas Cadangan Pembangunan Projek Perumahan, Dian Darul Naim Sdn Bhd, Kota Bharu, Kelantan
- 6. Mustafa, M. (2011), Environmental Law in Malaysia. Wolters Kluwer Law and Bussiness, Netherlands
- Malaysia, (1984), Laws of Malaysia Act 33: Uniform Building By-Law, MDC Sdn Bhd, Kuala Lumpur
- 8. Malaysia, (1976), Town and Country Planning Act 172, Comissioner of Law Revision Malaysia, Kuala Lumpur
- 9. Malaysia, (2016), National Land Code (Amendment) Act 56 of 1965, Percetakan Nasional Malaysia Berhad, Kuala Lumpur

RQS 102 – Quantity Surveying Studio 2

This course provides an understanding on the building design morphology, characteristics of iconic buildings and mega projects, infrastructure works, building services, preliminary cost estimate & elemental cost analysis, and environmental issues in construction.

- 1. Ashworth, A., (2013), Cost Studies of Buildings, 5th Edition, Routledge, New York
- 2. Kibert, C., (2012), Sustainable Construction : Green Building Design and Delivery, 3rd Edition, Wiley-Blackwell
- Robinson, H., Symonds, B., Gilbertson, B. and Ilozor, B. (2015), Design Economics for the Built Environment: Impact of Sustainability on Project Evaluation. Wiley-Blackwell, United Kingdom
- 4. Greeno, R. And Hall, F. (2015), Building services handbook, 8th Edition. Routledge.
- Sklair, L., (2017), The Icon Project: Architecture, Cities, and Capitalist Globalization, Oxford University Press, United Kingdom

RQG 131 – Principles of Quantity Surveying

This course introduces the quantity surveying profession and their roles within the RIBA plan of work and construction process. It explains the impact of construction industry to the society, economy and environment. The course also covers basic understanding in cost estimating, building economics, various Standard Methods of Measurement and mensuration techniques.

References

- 1. Cartlidge, D. (2012), Quantity Surveyor's Pocket Book, 2nd Edition, Routledge, New York.
- 2. Sinclair, D. (2013), Guide to Using the RIBA Plan of Work 2013, RIBA Publishing, London.
- 3. Abdullah, A. And Abdul Rashid, K. (2003), Pengukuran Kuantiti Bangunan, Pearson Prentice Hall
- 4. Lee, S., Trench, W. And Willis, A. (2014), Willis's Elements of Quantity Surveying, 12th Edition, Wiley-Blackwell
- Holm, L. (2005), Construction Cost Estimating: Process & Practice, Pearson Prentice Hall
- 6. The Institution of Surveyors (2000), Malaysian Standard Method of Measurement of Building Works, 2nd edition, ISM Malaysia: Petaling Jaya

RQS 201 – Quantity Surveying Studio 2

This course introduces professional QS practices with emphasis on pre-contract aspects as well as exposes students to the work processes through projects that mirror the requirement in the industry. In this course, students will be introduced to the roles and duties of QS as well as building morphology and construction contracts. The course will also emphasize on pre-contract stage of work which includes taking-off and BQ preparation including the types of tender and tendering process. Students will be working in teams for certain projects where they will have the opportunity to develop leadership, communication, problem solving and team-working skills.

Learning Outcomes

At the end of the course students will be able to:

- (i) Describe the role that a quantity surveyor plays in the various stage of work in a construction project.
- (ii) Differentiate the various standard forms of contract available in the industry and to produce a tender document.
- (iii) Take-off quantities and produce bill of quantities for a building.
- (iv) Develop interactional skills and the ability to work effectively in a group.

- 1. The Institution of Surveyors (2000). *Malaysian Standard Method of Measurement of Building Works*, 2nd Edition, Petaling Jaya: The Institution of Surveyor, Malaysia.
- 2. Willis, C. J. and Newman, D. (1994). *Elements of Quantity Surveying* 8th edition, Oxford, England: BSP Professional Books.

- 3. Rosli Abd. Rashid (1996). *Pengenalan Ukur Kuantiti Binaan* Kuala Lumpur: Dewan Bahasa dan Pustaka.
- 4. Wilcox C. and Snape J.A. (1980). *Measurement of Construction Work* Vol. 1 & 2 Second Edition. London: George Godwin Limited.

RQS 202 – Quantity Surveying Studio 3

This course is an extension of RQS 201 and builds students in the skills and knowledge of quantity surveying works. This course includes both new and advance topics. New topics include introduction to calculation of price rates, preparation of cost estimates, procurement, preparation of fee proposal and building conservation. Advanced topics on tendering and construction contract will also be covered in this course. Students will be given opportunity to work in teams and debates on current issues to hone their soft skills. Field trips will be organised to enable students to gain first-hand experience in construction sites.

Learning Outcomes

At the end of the course students will be able to:

- (i) Describe the contents of a tender report as well as contract documents for construction projects and advise clients on suitable procurement methods for a project based on the requirements of the client.
- (ii) To apply the understanding in construction law to solve contractual disputes and problems.
- (iii) Take-off quantities and prepare bill of quantities using computer.
- (iv) Develop interactional skills and the ability to work effectively in a group.

References

- 1. The Institution of Surveyors (2000). *Malaysian Standard Method of Measurement of Building Works*. Second Edition, Petaling Jaya: The Institution of Surveyor, Malaysia.
- 2. Griffiths P. (2006). *Estimating and Tendering for Construction Works Contract Practice for Surveyor.* Butterworth Heinemann.
- 3. Robinson, N. M. (2002). *Construction Law in Singapore & Malaysia* 2nd Edition Butterworths Asis.
- 4. Ashworth, A. (2008). Pre-contract Studies. Wiley-Blackwell Publishers

RQG 236 – Measurement 1

This course provides knowledge and basic skills in measurement of a small building based on the Standard Method of Measurement for Building Works, 2nd Edition (SMM2). This course also explains the basic principles of building measurement according to SMM2 and covers the method of measuring quantities for all major building elements which includes substructure, superstructure, finishing, external works and Bills of Quantities (BQ) preparation.

Learning Outcomes

At the end of the course, students will be able to:

- (i) Demonstrate the usage of measurement technique systematically using Standard Method of Measurement for Building Works, 2nd Edition (SMM2).
- (ii) Measure quantity of each building elements in detail and accurately.
- (iii) Construct a detail and clear building elements description.

References

- 1. The Institution of Surveyors (2000), Malaysian Standard Method of Measurement of Building Works, 2nd edition, ISM Malaysia: Petaling Jaya
- 2. Abdullah, A. and Abdul Rashid, K. (2003), Pengukuran Kuantiti Bangunan, Pearson Prentice Hall
- 3. Ostrowski, S. D.C. (2013), Measurement using the New Rules of Measurement, Wiley-Blackwell
- 4. Lee, S., Trench, W. and Willis, A. (2014), Willis's Elements of Quantity Surveying, 12th Edition, Wiley-Blackwell

RQG 237 – Measurement 2

This course explains the principles of measurement and covers the methods of measuring quantities for sub-structure, structural frame and infrastructure works according to the Standard Method of Measurement for Building Works, 2nd Edition (SMM2) and the Malaysian Civil Engineering Standard Methods of Measurement (MyCESMM). This course is an extension from RQG 236 Measurement 1 and it explains the principles of measurement and covers the methods of measuring quantities for sub-structure, structural frame and infrastructure works such as basement, roadworks, drainage, sewer reticulation, water reticulation, structural steel, diaphragm walling, etc.

Learning Outcomes

At the end of the course, students will be able to:

- (i) Demonstrate measurement techniques systematically for sub-structure, structural frame and infrastructure works according to the Standard Method of Measurement for Building Works, 2nd Edition (SMM2) and the Malaysian Civil Engineering Standard Methods of Measurement (MyCESMM).
- (ii) Measure the quantity of sub-structure, structural frame and infrastructure works in detail and accurately.
- (iii) Construct a detail and clear description of the measured elements.

- 1. The Institution of Surveyors (2000), Malaysian Standard Method of Measurement of Building Works, 2nd edition, ISM Malaysia: Petaling Jaya
- 2. Construction Industry Development Board (2013), Malaysian Civil Engineering Standard Methods of Measurement (MyCESMM), CIDB, Kuala Lumpur
- 3. Abdullah, A. And Abdul Rashid, K. (2003), Pengukuran Kuantiti Bangunan, Pearson Prentice Hall

- 4. Ostrowski, S. D.C. (2013), Measurement using the New Rules of Measurement, Wiley-Blackwell
- 5. Lee, S., Trench, W. And Willis, A. (2014), Willis's Elements of Quantity Surveying, 12th Edition, Wiley-Blackwell

RQB 261 – E Measurement

This course provides hands-on training in using special software to organize quantities measured from hardcopy drawings and to generate the Bill of Quantity (BQ) upon completion of the entire taking-off process. It also offers the same hands-on experience in using CAD software to take-off quantities from CAD drawings and finally the use of BIM application to extract and organize quantities from 3D CAD drawings for BQ purposes.

Learning Outcomes:

At the end of the course, students will be able to:

- (i) Measure and organise quantities for the production of bill of quantities using customized softwares.Demonstrate the use of suitable cost management technique in each phase of the construction process
- (ii) Demonstrate techniques of measurement from 3D CAD drawings using softwares and related applications.
- (iii) Perform measurement using related software's based on project needs

References

- 1. The Institution of Surveyors (2000), Malaysian Standard Method of Measurement of Building Works, 2nd edition, ISM Malaysia: Petaling Jaya
- 2. Pittard, S. & Sell, P. (2016), BIM and Quantity Surveying, Routledge
- 3. Binalink (2015), Manual for Binalink, Kuala Lumpur
- 4. Wing, E., (2015), Autodesk Revit Architecture: No Experience Required, Wiley, Canada.
- 5. Duell, R., Hathorn, T., Hathorn, T.R. (2016). Autodesk Revit Architecture Essentials, Wiley, Canada
- 6. Eastman, C., Teicholz, P., Liston, K. (2011). BIM Handbook: A guide to Building Information Modeling for Owners, Managers, Designers, Engineers, and Contractors, Wiley, Canada.
- 7. Saxon, R., (2016). BIM for Construction Clients., RIBA Publishing
- 8. https://www.udemy.com/bim-training/

RQS 303– Quantity Surveying Studio 3

This course is a continuation of the course RQS 202. It introduces professional QS practices which emphasizes on post-contract aspects which include cost control, progress payment, variation order, extension of time, loss and expense and final account. Good site management practice is also covered in this course.

Learning Outcomes

At the end of the course, students will be able to:

- (i) Demonstrate the ability to control and monitor project cost based on actual construction work during post-contract stage.
- (ii) Propose solutions to issues related to the responsibilities of quantity surveyor during the post-contract stage including construction site issues.
- (iii) Relate contractual and legal matters in the management of a construction project.
- (iv) Present issues clearly and confidently.
- (v) Organise a team effectively and understand the role between leader and team members.

References

- 1. Lee, S., Trench, W. And Willis, A. (2014), Willis's Elements of Quantity Surveying, 12th Edition, Wiley-Blackwell
- 2. Cartlidge, D. (2012), Quantity Surveyor's Pocket Book, 2nd Edition, Routledge, New York.
- 3. Ashworth, A., Hogg, K. and Catherine, H. (2013) Willis's Practice and Procedure for the Quantity Surveyor, 13th Edition, London,
- 4. England: Wiley-Blackwell.
- 5. Towey, D. (2013), Cost Management of Construction Projects, Wiley-Blackwell.

RQS 304 – Quantity Surveying Studio 4

This course is a continuation from RQS 303 Studio Quantity Surveying 3 which equips the student with recent issues in the construction industry at the local and international level as a preparation for their future career. Students are exposed to the modus operandi, challenges and rewards of international practice, appointment of consultants, value management as well as contemporary issues. In line with the university to nurture entrepreneurship, students are required to come up with a mock business set up. To prepare the students when they leave the university, personal development lifelong learning and carrer planning are incorporated in the curriculum.

Learning Outcomes

At the end of the course students will be able to:

- (i) Differentiate work practices at local and international levels.
- (ii) Discuss professional practice of a quantity surveyor and job opportunities at professional and corporate level.
- (iii) display leadership skills in multidisciplinary setting.

References

- 1. Cartlidge, D. (2011) New Aspects of Quantity Surveying Practice, 3rd Edition, Routledge, Oxford
- 2. Hughes, G. (1998) Anatomy of Quantity Surveying, second edition, London: Construction Press.
- 3. Kelly, J., Male, S. and Graham D. (2010) Value Management of Construction Projects, Willey, London.
- 4. Shen, G.Q.P. and Yu A.E.W. (2015) Value Management in Construction and Real Estate: Methodology and Application, Routledge, New York.
- 5. Peh, L.C. and Low, S.P. (2013) Organization Design for International Construction Business, Springer, Singapore.
- 6. Smyth, H. (2011) Managing the Professional Practice: in the Built Environment, Wiley-Blackwell, London.
- 7. www.rics.org

RQG 355 – MANAGEMENT, SUSTAINABILITY AND INTERNATIONALISATION

This course focuses on three important areas namely, management, sustainability and internationalization related to construction industry. The management aspect covers entrepreneurship, leadership and organizational management. Sustainability includes green concept, heritage conservation and safety issues while internationalisation shall look into multi-lateral trade agreement and procurement. These aspects will be discussed in relation to its significance to a quantity surveyor.

Learning Outcomes:

At the end of the course, students will be able to:

- (i) Discover the theories and issues on management, sustainability and internationalisation in the context of quantity surveying.
- (ii) Practise critical thinking in discussing local and international contemporary issues to elevate the level of professionalism among quantity surveyors.
- (iii) Demonstrate an understanding of the needs of future generation and to appreciate built heritage
- (iv) Integrate management and entrepreneurial skills in the context of quantity surveying.

- 1. Kibert, C.J. (2016), Sustainable Construction: Green Building Design and Delivery, 4th Edition, Wiley
- 2. Forysth, M. (2013) Understanding Historic Building Conservation, Wiley
- 3. RICS (2003) Historic Building Conservation : RICS Guidance Note, 1st Edition, RICS
- 4. Goodhew, S. (2016) Sustainable Construction Process: A Resource Text, Wiley Blackwell
- 5. Zhao, X., Hwang, B.G. and Low, S. P. (2015). Enterprise Risk Management in International Construction, Springer, Singapore.
- 6. Peh, L. C. and Low, Sui Pheng (2013) Organisation Design for International Construction, Springer, Singapore.

RQG 356 - COST MANAGEMENT

This course provides the fundamental knowledge in cost management in both pre and post contract stages including risk management and whole life cycle costing. Cost management at pre-contract covers cost modelling, cost indices and cost budgeting while post-contract focuses on cost monitoring and cost control activities such as progress payment, extension of time, loss and expense, variation order and final account. Students will also be exposed to the theory of risk management and whole life cycle costing.

Learning Outcomes:

At the end of the course, students will be able to:

- (i) Demonstrate the skill to manage, control and monitor cost in a construction project.
- (ii) Demonstrate the use of suitable cost management technique in each phase of the construction process
- (iii) Explain theory of Whole Life Cycle Costing and risk management

References

- 1. Jaggar, D. et al (2002), Building Design Cost Management. Blackwell Science
- 2. Kirkam, R. (2008), Ferry and Brandon's Cost Planning of Buildings, 8th Edition, Blackwell Science
- 3. Ashworth, A. (2008), Pre Contract Studies, Wiley Blackwell
- 4. Ashworth, A. and Perera, S. (2015), Cost Studies of Buildings, 6th Edition, Routledge
- 5. Smith, J., Jagger, D., Love, P. (2016) Building Cost Planning for The Design Team, 3rd Edition, Routledge
- 6. Cartlidge, D. (2012), Quantity Surveyor's Pocket Book, 2nd Edition, Routledge, New York.
- 7. Seeley, I. (1995), Building Economics, 4th Edition, MacMillan
- 8. Seeley, I. (1996), Building Economics: Appraisal and Control of Building Design, Cost and Efficiency, MacMillan, New York

RQG 358 PROFESSIONAL PRACTICE FOR QUANTITY SURVEYORS

This course introduces the Quantity Surveyor Act and related professional bodies, followed by work ethics, values and responsibilities. Apart from that, this course also focuses on ethical conduct of the professional Quantity Surveyor and the relevance of various statutory instruments governing the profession. New and contemporary practice management concepts will be explored, apart from traditional service. A comparative analysis of the relevant institutions and establishing key performance indicators (KPI) for benchmarking, a critical analysis of the functions and purpose of the BQ and post contract documentations will be carried out. This course also emphasizes on negotiation skills, management of consultant team and the changing role of quantity surveyors.

Learning Outcomes:

At the end of the course students will be able to:

- (i) Explain the legal and professional practice related to Quantity Surveying in Malaysia.
- (ii) Integrate responsibility, value and ethics with quantity surveying professional practice.
- (iii) Demonstrate the ability to manage consulting team, client and to conduct negotiation.
- (iv) Display the ability to adapt to changes in the industry and technology advancement and be innovative in the dynamic environment.

References

- 1. Willis, C.J, Ashworth. A and Catherine. H., (2013), Practice and Procedure for the Quantity Surveyor (13th Edition), Wiley Blackwell Publications.
- Turner, Dennis F. (1996), Quantity Surveying Practice and Administration (3rd. Edition) George Godwin
 Saclay, Juan H. (2000). Quality Surgeying Practice, MacMillan

Seeley, Ivor H., (2000), Quality Surveying Practice, MacMillan.

- 3. Hughes, G. (1981), Anatomy of Quantity Surveying (2nd Edition), Construction Press
- 4. Jabatan Peguam Negara (2014), Construction Industry Payment & Adjudication (CIPA) Act, Kuala Lumpur

RQL 371 - QUANTITY SURVEYING FINAL YEAR PROJECT

This course equips the students with research skills and techniques, ability to work independently and to build interest in research work. Students are required to select an appropriate research topic that can come from a diverse range of areas that include construction contracts and contractual issues, professional practice, cost and estimating, procurement systems, among others.

Learning outcomes:

At the end of the course students will be able to:

- (i) Synthesise information gathered from the literature review to form problem statement and conceptual or theoritical statement.
- (ii) Identify critical issues for research and to propose appropriate research methodology
- (iii) Practice fluent and professional communication with respondents in order to obtain necessary data to be analyzed.
- (iv) Comply with research ethics in all stages of research process.
- (v) Work on the literature search, data collection and analysis through the optimum usage of technology.
- (vi) Demonstrate the ability to manage time, resources and data in completing the research project.

- 1. Sharp, J.A. and Howard, K. (2002) The Management of a Student Research Project, 3rd Edition, Gower Publishing Ltd. Hants, England.
- 2. Tan, W. (2001) Practical Research Methods, Practice Hall, Singapore.
- 3. Salkind, N.J. (2016) Exploring Research, 9th Edition, Person Education Inc., New Jersey, USA.
- 4. Strauss, A. and Corbin, J (1998) Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory, SAGE Publications Inc. California, USA
- Sekaran, U. & Bougie, R. (2016) Research Methods For Business: A Skill Building Approach, 7th Edition, John Wiley & Sons, Inc., New York.

4.7.5 Courses in Urban and Regional Planning

RPS 104 – Integrated Studio (Planning)

The studio project emphasises on the application of green and sustainable principles and design elements in the planning of urban space and urban neighbourhoods. Students are trained to think systematically and holistically based on broad readings and urban planning best practices from around the world, as well as to develop skills in architectural lettering, technical drawings 2D 3D and graphic communication. Students will conduct site analysis at actual location, prepare a concept plan and translate the sustainable design elements in a neighbourhoopd layout plan, in accordance with the provisions in the Town and Country Planning Act 1976 (Act 172) and the Housing Guidelines and Planning Standards prepared by the Department of Town and Country Planning, Ministry of Urban Wellbeing, Housing and Local Government.

Learning Outcome:

- (i) Knowledge of urban planning and understands the concept of form, space, structure, scale and function of space in a building, in the city, as well as the relationship (connectivity), circulation and access between space.
- (ii) Technical and graphics skills to prepare the key plan and base map for the site and area.
- (iii) Technical knowledge and skills to collect data relevant to the urban environment, conduct site analysis and presents results of the analysis graphically.
- (iv) Oral communication skills to present scale, function and urban space graphically using technical drawings and 2D and 3D models.

References

- 1. Ibrahim Wahab (1991) Perancangan Bandar: Aspek Fizikal dan Kawalan Pembangunan, Kuala Lumpur: Dewan Bahasa dan Pustaka.
- 2. Jabatan Perancang Bandar dan Desa Negeri Pulau Pinang (2007) Rancangan Struktur Negeri Pulau Pinang 2020, Pulau Pinang: JPBD.
- 3. Federal Department of Town and Country Planning Malaysia (2005). National Physical Plan, Kuala Lumpur: JPBD.
- 4. Jabatan Perancang Bandar dan Desa Semenanjung Malaysia (2008) Akta 172: Akta Perancangan Bandar dan Desa 1976, Kuala Lumpur: JPBD.
- 5. Lin, M. W. (1993) Drawing and Designing with Confidence: A Step-by-step Guide. New York: John Wiley & Sons, Inc.
- 6. Majlis Perbandaran Pulau Pinang (2008) Dasar-Dasar dan Garispanduan, Pulau Pinang: MPPP.

RPS 106 – Design Studio (Planning)

The studio project emphasises on the application of green and sustainable principles and design elements in the planning of urban space and urban neighbourhoods. Students are trained to think systematically and holistically based on broad readings and urban planning best practices from around the world, as well as to develop skills in architectural

lettering, technical drawings 2D 3D and graphic communication. Students will conduct site analysis at actual location, prepare a concept plan and translate the sustainable design elements in a neighbourhoopd layout plan, in accordance with the provisions in the Town and Country Planning Act 1976 (Act 172) and the Housing Guidelines and Planning Standards prepared by the Ministry of Urban Wellbeing, Housing and Local Government.

Learning Outcome:

- (i) Knowledge of urban planning and understands the concept of form, space, structure, scale and function of space in a building, in the city, as well as the relationship (connectivity), circulation and access between space.
- (ii) Technical and graphics skills to prepare the key plan and base map for the site and area.
- (iii) Technical knowledge and skills to collect data relevant to the urban environment, conduct site analysis and presents results of the analysis graphically.
- (iv) Oral communication skills to present scale, function and urban space graphically using technical drawings and 2D and 3D models.

References

- 1. Ibrahim Wahab (1991) Perancangan Bandar: Aspek Fizikal dan Kawalan Pembangunan, Kuala Lumpur: Dewan Bahasa dan Pustaka.
- 2. Jabatan Perancang Bandar dan Desa Negeri Pulau Pinang (2007) Rancangan Struktur Negeri Pulau Pinang 2020, Pulau Pinang: JPBD.
- 3. Federal Department of Town and Country Planning Malaysia (2005). National Physical Plan, Kuala Lumpur: JPBD.
- 4. Jabatan Perancang Bandar dan Desa Semenanjung Malaysia (2008) Akta 172: Akta Perancangan Bandar dan Desa 1976, Kuala Lumpur: JPBD.
- 5. Lin, M. W. (1993) Drawing and Designing with Confidence: A Step-by-step Guide. New York: John Wiley & Sons, Inc.
- 6. Majlis Perbandaran Pulau Pinang (2008) Dasar-Dasar dan Garispanduan, Pulau Pinang: MPPP.

RPK 131 – Applied Quantitative Methods

This course introduces the quantitative data analysis. The difference between the descriptive and inferential is explained. Students are being exposed to the methods and techniques of analyzing quantitative data. The method of analyzing descriptive and inferential will be explained and students are to summarize the research outcomes.

Learning Outcomes

- (i) Explain the concept and philosophy of sustainable design that influences the development of cities in Asia.
- (ii) Elaborate and differentiate various development and urban planning approaches from Western and Islamic perspectives.
- (iii) Demonstrate and execute the basic of preparing development plans at national, state and local levels towards preparation for planning permission.

(iv) Explain and relate the principles of regional and rural development process, and its linkages on economic, social, physical and environmental components.

References

- 1. Bryman, A. & Creamer, D. (1997). *Quantitative Data Analysis with SPSS for Windows: A Guide for Social Scientist.* London: Routledge.
- 2. Amir Hussin Baharuddin (1989). *Kaedah Kuantitatif Suatu Pengenalan*.Kuala Lumpur: Dewan Bahasa dan Pustaka.
- 3. De Vaus, D. A. (1986). Surveys in Social Research. London: Unwin Hyman.
- 4. Zainal Mat Saad (1985). Pengantar Statistik. Petaling Jaya: Fajar Bakti

RPK 133 – Principles of Planning

This course aims to enhance the students' understanding of the quantitative and qualitative techniques and models employed in urban and regional planning. The applications of these techniques and methods are shown in related case studies of population, employment, income, land use, housing, commercial, recreation, transportation and traffic circulation. The students will analyse the dynamic relationships that exist between attributes of overlapping concentrations of people and activities in cities and regions in order to prepare feasible spatial plans for the community based on quantitative and qualitative data analysis as well as evaluation of alternative plans.

Learning Outcome:

- (i) Knowledge of statistical methods, process of sampling and data collection instruments in the field to ensure data validity and reliability.
- (ii) Technical skills to organise collected data for data presentation.
- (iii) Thinking skills to link the theory and principles of population concentration and activities in an area and their implications for urban and regional planning.
- (iv) Oral communication skills and demonstrate the application of quantitative and qualitative models and methods in the analyses of population, employment, land use, housing, commercial, leisure, transport and traffic; and propose alternative plans to address planning problems.

- 1. Babbie, E.R. (2010). *The Practice of Social Research (12th edition)*. Belmont, CA: Wadsworth.
- 2. Berg, B.L. (2004). *Qualitative Research Methods for the Social Sciences*, 5th edition, Boston: Pearson.
- 3. Bryman, A. (1988). *Quantity and quality in social research*. London: Unwin Hyman.
- 4. Bryman, A. and Cramer, D. (1990). *Quantitative data analysis for social scientists*. London and New York: Routledge.
- Dane, F.C. (1990). *Research Methods*. California: Brooks/Cole Publishing Co. Denzin, N.K. and Lincoln, Y.S. (2000) (eds.). *Handbook of qualitative research (2nd edition)*. Thousand Oaks: Sage Publications.
- 6. De Vaus, D. (2002). Surveys in Social Research (5th ed.). London: Routledge.
- Frankfort-Nachmias, C. and Nachmias, D. (2000). *Research methods in the Social Sciences* (6th edition). New York: Worth Publishers.

- 8. Jackson, W. (1988). *Research Methods : Rules for Survey Design and Analysis*. Scarborough: Prentice-Hall Canada.
- 9. Klosterman, Richard E. (1990). *Community Analysis and Planning Techniques*. New York: Rowman and Littlefield Publishers, Inc.
- 10. Krueckeberg, Donald A. and Arthur L. Silvers (1974). Urban Planning Analysis: *Methods and Models*. New York: John Wiley and Sons.
- 11. Marsh, C. (1988). *Exploring Data : An Introduction to Data Analysis for Social Scientists*. Cambridge : Polity Press.
- 12. Oppenheim, A. N. (1992). *Questionnaire Design, Interviewing and Attitude Measurement*. London & NY: Continuum.
- 13. Ziesel, J. (1981). *Inquiry by Design: Tools for environment-behaviour research*. Cambridge: Cambridge University Press.

RPK 123 – Planning and Environment Conversation

This course covers aspects of environmental planning, management and conservation principles, planning process, and urban and rural land use concepts. The relationship between environmental quality and land use planning (urban and rural) will be studied. The analytical approach and control in planning, management and conservation taking into account social and physical factors will be given a special emphasis.

Learning Outcome:

- (i) Identify the principles and concepts of planning, management and conservation of the environment.
- (ii) Link critically the concepts of environmental planning in urban and rural development in Malaysia and global context.
- (iii) Propose solutions to issues in environmental planning and conservation.

- 1. Adams, William M. 2008. Conservation. Volumes 1-4. London: Earthscan.
- 2. Aiken, R. S., Leigh, C., Leinbach, C. & Moss, M. 1982. Development and Environment in Peninsular
- 3. Malaysia. New York & Singapore: McGraw Hill.
- 4. Botkin, Daniel B. & Keller, E. 2000. *Environmental Science: Earth as a Living Planet*. New York: John Wiley & Sons.
- 5. Clark, B. D. et al. 1980. Environmental Impact Assessment. London: Mansell.
- 6. Hamirdin b. Ithnin et al. 2008. Isu-isu Geografi Malaysia. Kuala Lumpur: Jabatan Geografi, Fakulti
- 7. Sastera dan Sains Sosial, Universiti Malaya. 416pp.
- 8. Katiman Rostam (ed). 2008. *Dinamika Sosial, Pembangunan and Persekitaran di Malaysia*. Kuantan, Malaysia: Pro Book Publication, 276pp.
- 9. McNeely, Jeffrey A. & Miller, K. 1984. *National Parks, Conservation and Development*. Washington: Smithsonian Institution Press.
- 10. Munn, R. E. (ed). 1979. Environmental Impact Assessment SCOPE Reports 5. Chichester: Wiley.
- 11. Newson, M. 1992. *Managing the Human Impact on the Natural Environment: Patterns and Processes.* London: Belhaven Press.

- 12. Park, C. C. 1980. Ecology and Environmental Management Studies in Physical Geography. London: Butterworth.
- 13. Sham Sani. 1993. Environment and Development in Malaysia: Changing Concerns and Approaches. Kuala Lumpur: ISIS Malaysia.
- 14. Sitarz, D. 1994. *Agenda 21: The Earth Summit Strategy to Save Our Planet*. Boulder, Colorado: Earth Press.
- 15. Snarr, M. T. & Snarr, D. N. 2005. *Introducing Global Issues*. Colorado: Lynne Rienner Publishers.
- 16. Undang-Undang Malaysia. Akta 127. 1974. Kualiti Alam Sekeliling.
- 17. Undang-Undang Malaysia. Akta 636 (pindaan 1985). Kualiti Alam Sekeliling.
- 18. Undang-Undang Malaysia. Akta 1102 (pindaan 2001). Kualiti Alam Sekeliling.
- 19. Wathern, P. 1992. Environmental Impact Assessment. New York: Routledge.

RPS 205 – Planning Studio 1

Planning Studio 1 focuses on acquiring research analytical skills as well as preparing technical reports.Students's ability to go through the planning process will be constantly monitored and developed. Their ability to partake research exercises will also be evaluated. Students will be given 'life relevant' projects where evaluation is based on their abilities to perform individually as well as in group.

Learning Outcomes

At the end of the course students will be able to:

- (i) Understand the planning process through the applications of real and hypotetical case studies.
- (ii) Build good relations and interactions with others as well as cooperate in more efective ways.
- (iii) Collect, analyze data and information and produce professional reports.
- (iv) Deliver ideas and make presentations more effective and confident using latest technologies.

References

- 1. Laseau, P. (2001). *Graphic Thinking For Architects & Designers 3rd Edition*. New York: John Wiley & Sons, Inc.
- 2. Mills, C. (2000). Designing With Models: A Studio Guide To Making And Using Architectural Design Models. New York: John Wiley & Sons, Inc.
- 3. Ching, F.D.K. (1996). Architecture: Form, Space & Order. New York: John Wiley & Sons, Inc.
- 4. Lin, Mike W. (1993). Drawing And Designing With Confidence: A Step-By-Step Guide. New York: John Wiley & Sons, Inc.

RPS 206 – Planning Studio 2

Planning Studio 2 prepares students with the knowledge on urban planning and the preparation of layout and master plan. It discusses on the application and development of new and old physical planning concepts and offers knowledge on site evaluations and the preparation and implementation of development proposals.

Learning Outcomes

At the end of the course, students will be able to:

- (i) Enhance the quality of work, presentations and planning design proposals.
- (ii) Expose students to alternative presentation aspects.
- (iii) Understand the planning and development process through real and hyphotetical aspects.
- (iv) Generate creative activities towards sustainable environment.
- (v) Deliver ideas and make presentations more effective and confident using latest technologies.

References

- 1. Laseau, P. (2001). *Graphic Thinking For Architects & Designers 3rd Edition*. New York: John Wiley & Sons, Inc.
- 2. Mills, C. (2000). Designing With Models: A Studio Guide To Making And Using Architectural Design Models. New York: John Wiley & Sons, Inc.
- 3. Ching, F.D.K. (1996). *Architecture: Form, Space & Order*. New York: John Wiley & Sons, Inc.
- 4. Lin, Mike W. (1993). Drawing And Designing With Confidence: A Step-By-Step Guide. New York: John Wiley & Sons, Inc.

RPG 235 – Geographic Infromation System and Computer Aided Design for Planning

This course utilizes geographic information system (GIS) and computer aided design (CAD) to produce maps and working plans. Hands-on learning approach is applied.

Learning Outcomes

At the end of the course, students will be able to:

- (i) Demonstrate the use of instructions in GIS and CAD software to produce maps and plans in a format that meets market requirements and standards.
- (ii) Describe and differentiate the concepts and features between GIS and CAD software.
- (iii) Prepare, analyze and present planning data and plans using GIS and CAD.
- (iv) Generate and manipulate primary and secondary data in the form of maps and plans from manual to digital using real-earth coordinates.

- 1. Environmental Systems Research Institute, Inc (1996). *Using Arcview GIS*. ESRI, Redlands, California, USA.
- 2. Demers, Michael N. (2005). *Fundamentals of Geographic Information Systems*. John Wiley & Sons Inc, USA
- 3. Omura, George (2006). *Mastering AutoCAD 2007 and AutoCAD LT 2007, Autodesk*. San Rafeal, California, USA

RPK 221 Landscape Planning

Landscape Planning is a course that emphasizes on the relationship between human beings and the environment with special focus on the aspect of assessment techniques, planning, design, and the used of planting materials in landscape planning. The course will focus on three respective parts.

Part one will expose students to the understanding of the relationship of human and its environment and problems associated with it. This will further expose the students to the historical aspects of human civilization; human desire to make changes to the existing landscape – especially the landscape that suits in with the desire to fulfill the esthetics and functional aspects of human habitation.

The second part of the lecture will focus on the approach and techniques in planning and assessing the landscape. The ecological approach adopted by Ian McHarg will be discussed and elaborated. This will include the techniques in inventory and the analysis of the landscape.

The last part will focus on landscape design, theories and principles of design within the framework and perimeters of environment and social changes. Students will also be able to learn in this course the aspect of landscape horticulture with the emphasis on the useof soft and hard landscape materials that is suitable to this tropical climate and cultures.

Learning Outcomes

- (i) Identify techniques in solving planning problems and landscape evaluation
- (ii) Propose solutions on environmental issues and limited resources at the planning stage.
- (iii) Lead, discuss, share informations and propose new ideas for the welfare of human habitat environment

References

- 1. Rutledge, A. (1981). A Visual Approaches to Park Design. NY Press.
- 2. Rutledge, A. (1986). Anatomy of Parks. Mc Graw&Hill
- 3. Waterman T. (2009). The Fundamentals Of Landscape Architecture. AVA Pub.
- 4. Jamel A. (2003). Koleksi Tanaman Hiasan Di Malaysia. Amber Solara Pub
- 5. McHargI. (1992). Design with Nature. New York J.Wiley.
- 6. Murat O. (2012) Landscape Planning, Publisher: InTech.

RPK 223 – Tourism Planning and Development

This course provides an overview of tourism planning and development through the examination of different types of tourism, tourism systems, processes and stages in sustainability context. The dynamic industry allows for real-time analysis of local, national, and international current events impacting upon the different industry sectors through a management frame of reference.

Learning Outcome:

- (i) Analyse the theories and models in tourism planning and development.
- (ii) Identify and analyse current issues of tourism development in the context of sustainable tourism.
- (iii) Study the impact of tourism development on the economy, environment and cultural values in relation to local and foreign case studies

References

- 1. Badaruddin Mohamed (2006). Pelancongan Mampan. Kuala Lumpur: DBP
- 2. Gunn, C.A. (2002). *Tourism planning: Basics, Concepts, Cases*. Fourth Edition. New York: Routledge.
- 3. Hall, C.M. (2000). *Tourism Planning: Policies, Processes and Relationships*. Harlow: Prentice Hall.
- 4. Inskeep, E. (1991). *Tourism Planning: An Integrated and Sustainable Development Approach*. New York: Van Nostrand Reinhold.
- 5. Mill, R.C. and Morrison, A.M. (1998). *The Tourism System: an Introductory Text*. New Jersey: Prentice-Hall.

RPK 232 - Urban Design

This course will concentrate on urban design from the perspective of town planning, architecture, history and heritage, economic as well as the policy that controls it. It covers the basic concepts in urban design and the transformation process from the proto and colonial period up to the 21 century. Urbanization method and practices implemented by the public and private sectors will be discussed.

Learning Outcome:

- (i) Differentiate the urban design concepts and approaches of the past till the present, as well as the design perspectives of Asian and European cities.
- (ii) Organise the basic concepts of urban design in the planning and development of cities.
- (iii) Evaluate plans and propose the best strategies in urban design.

References

- 1. Cliff Moughtin, R. Cuesta, C. Sarris, P. Signoretta, (1999). Urban Design: Method and Techniques.
- 2. Kementerian Perumahan dan Kerajaan Tempatan Malaysia,(2006) *Dasar Perbandaran Nasional*, Jabatan Perancangan Bandar dan Desa, Kuala Lumpur.
- 3. Hassan,A.S.,(2005), *Rekabentuk Bandar di Semenanjung Malaysia Kuala Lumpur dan Bandar Baru di Sekitarnya*,Penerbit USM.
- 4. Gallion, E. (1975), *The Urban Pattern*, D. Nostrand Company, New York, Toronto, London
- 5. Larice, M,(editor), (2005) *The Urban design Reader*, University of California, USA, Routledge, Taylor & Francis Group.
- 7. Hall, Peter, (1988), Cities of Tomorrow, Oxford, Blackwell.

RPK 238 – Sustainable Development Planning

This course adopts a multidisciplinary approach to propagate innovative, "out-of-thebox" development plans and spatial planning decisions which contribute to the delivery of sustainable development and planning in contemporary and future human settlements. Both global and local factors that influence the process and trends of planning and development are identified to uphold the structure and framework of sustainable urban and regional dynamics. The course covers multi-disciplinary subjects of environmental design and planning, environmental economic management, spatial planning, socioeconomic planning and sustainable development. This holistic framework enables students as prospective stakeholders to devise strategies to establish a rational organisation of space, people and activity within a cleaner and healthier environment. The management of change, transitions, and development is a central problem in sustainable development planning. This course will allow students to engage the potential for change that is rooted in human organisations and to bring multiple actors into interaction across organizational boundaries.

Learning Outcome:

- (i) Explain the process and trends that shape the planning structure and activity in urban and regional development, as well as identify issues and problems related to urban and regional holistically.
- (ii) Analyse planning policy and development indicators to measure performance over time and space in terms of demography, mobility, settlement, employment, poverty alleviation, entrepreneurship and local economic development.
- (iii) Identify the role and functions of stakeholders involved in the decision making process in the city and region

- 1. Asian Development Bank, 2010. Urban Development in Asia: Special Report. *Development Asia*, 3 (4), pp. 1-40.
- 2. DCLG (Department for Communities and Local Government, UK), 2012. *National Planning Policy Framework*, London: DCLG.
- IPCC (Intergovernmental Panel on Climate Change), 2014. Climate Change 2014:Impacts, Adaptation and Vulnerability. Available at http://ipccwg2.gov/AR5/images/uploads/WG2AR5_SPM_FINAL.pdf
- 4. IISD (International Institute for Sustainable Development), 2012. Solutions for Improved Human Well-being. Available at http://www.iisd.org/pdf/2012/annrep_2011_2012_en.pdf
- 5. Inam, A. 2014. Designing Urban Transformation. New York: Routledge.
- 6. James, P., Magee, L., Scerri, A. & Steget, M.B., 2015. Urban Sustainability in *Theory and Practice: Circles of Sustainability*. London: Routledge.
- Kong, L., 2010. Making Sustainable Creative/Cultural Space in Shanghai and Singapore. *Geographical Review 99* (1): 1–22. doi:10.1111/j.1931-0846.2009.tb00415.x.
- 8. NIC-USA (National Intelligence Council), 2008. *Global Trends* 2025:A *Transformed World*. Available at http://www.dni.gov/nic/NIC_2025_project.html
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- 10. UN-Habitat, 2012. *State of the Worlds' Cities 2012/2013 Prosperity of Cities*. Malta : Progress Press Ltd. Available at http://sustainabledevelopment.un.org/content/documents/745habitat.pdf
- 11. UNU-IHDP & UNEP, 2012. Inclusive Wealth Report 2012. Measuring progress toward sustainability. Cambridge: Cambridge University Press.

RPS 307 – Planning Studio 3

Projects conducted in this studio involve the preparation of physical plans by utilizing planning process mechanism so that a more holistic approach can be employed. Students will prepare a concept plan proposal and alternative layout plans taking into consideration the current economic reality, justification for plan evaluation, and estimated cost for development plan proposal.

Learning Outcome:

- (i) Investigate planning issues and problems from a holistic paradigm, including physical, social, cultural, economic, environmental, technology etc.
- (ii) Elaborate and apply the principles of sustainable development and Local Agenda 21 in local planning context.
- (iii) Identify and analyse the planning problem and produce a conceptual framework for the layout plan preparation.
- (iv) Understand and participate in organisation, leadership, entrepreneurship and decision making.

References

- 1. American Planning Association (2006). *Planning and Urban Design Standards, Student Edition.* Hoboken, NJ: John Wiley & Sons.
- 2. Babbie, Earl R. (1990). Social Research Method, 2nd edition, Belmont, CA.: Wadsworth
- 3. Babbie, Earl R. (2001). *The Practice of Social Research*,9*h edition*, Belmont, CA.: Wadsworth
- 4. Berke, Philip R., David R. Godshalk, and Kaiser, Edward J. (2006). *Urban Land Use Planning (5th ed.)* Chicago: University of Illinois Press.
- 5. Dept. of Town and Country Planning Malaysia (2005). National Physical Plan, KL:JPBD
- 6. Dept. of Town and Country Planning Malaysia Planning Standards, KL:JPBD

RPS 308 – Planning Studio 4

Projects conducted in this studio involve the preparation of physical plans such as Structure Plan, Local Plan, Special Area Plan, etc, as documented in the Town and Country Planning Act Malaysia (1976) (Act 172). Comprehensive and in-depth understanding of related planning issues and problems from the physical, social, economic, and environmental aspects. As an extension of Planning Studio 3, it focuses on "live" projects to allow students to utilize knowledge, skills and intellectual resources in conceptualizing the planning problems at stake. It allows students to formulate feasible solutions and policy measures to address specific planning problems in accordance with the principles of sustainable development.

Learning Outcome:

- (i) Explain the planning system and process at local and regional level.
- (ii) Investigate planning issues and problems in a holistic manner, including physical, social, and economic aspects; and synthesise the relationships among sectors.
- (iii) Produce a conceptual framework to address planning problems including research design, preparation of development plans, plan assessment and cost estimates.
- (iv) Propose strategies and policies through the preparation of development plans as a planning team.

References

- 1. American Planning Association (2006). *Planning and Urban Design Standards, Student Edition.* Hoboken, NJ: John Wiley & Sons.
- 2. Babbie, Earl R. (1990). Social Research Method, 2nd edition, Belmont, CA.: Wadsworth
- 3. Babbie, Earl R. (2001). *The Practice of Social Research,9h edition*, Belmont, CA.: Wadsworth
- 4. Berke, Philip R., David R. Godshalk, and Kaiser, Edward J. (2006). *Urban Land Use Planning (5th ed.)* Chicago: University of Illinois Press.
- 5. Dept. of Town and Country Planning Malaysia (2005). National Physical Plan, KL:JPBD
- 6. Dept. of Town and Country Planning Malaysia Planning Standards, KL:JPBD

RPK 331 – Theory and Philosophy of Planning

This course introduces and exposes students to the basis of planning philosophies and theories utilized within the planning fields throughout the world. Learning and understanding will be based on the experiences of the developed nations that could be applied to the developing countries particularly to the Malaysian planning scenario. Emphasis will also be given to the roles of planners in relation to the current theories and philosophies of planning.

Learning Outcome:

- (i) Understand the origins of planning and its evolution till the present time.
- (ii) Introduce the philosophical background and political reality in urban planning with the concept and aspects of pluralism and multi-dimensional development.
- (iii) Adapt methods and techniques of analysis and critical assessment for decisionmaking.
- (iv) Balance both the physical and social aspects of development in city planning.

- 1. Paris, Chris (1982). Critical Readings in Planning Theory, Pergamon Press, Oxford.
- 2. Faludi, Andreas (1973). *Planning Theory*, Pergamon Press, Oxford.
- 3. Goh, Ban Lee (1991). Urban Planning in Malaysia History, Assumptions and Issues, Tempo Publishing.
- 4. Bunnell, Tim, Drummond, B.W & K.C. Ho, (eds.) (2002). *Critical Reflections on Cities in Southeast Asia*, Brill Times Academic Press, Singapore.
- 5. Kotkin, Joel (2005). *The City A Global History*, Modern Library.

RPK 333 – Methodology and Techniques of Research

The course objective is to introduce the process and elements of scientific research; data collection methods and analyses as well as report preparation. Research process includes scientific characteristics and measurements. Research elements include understanding the roles of concepts, hypotheses and theories in research. Students should also be able to understand the data collection methods, analysis and sampling procedures.

Learning Outcome:

- (i) Understand the process and elements of scientific research, methods of data collection and analysis of data/information and the preparation of research reports.
- (ii) Demonstrate the applications of research methods and techniques.
- (iii) Describe and relate the applications of research methods and techniques in relevant professional fields.
- (iv) Adopt methods and techniques of data analysis and critical assessment for decisionmaking.

References

- 1. Babbie, E., (2005) Practice of Social Research (Collection Editions)
- 2. Dawson C (2007) A Practical Guide to Research Methods 3rd Edition
- 3. Black, Thomas, R.,(1993) Evaluating Social Science Research, Sage Publication, London
- 4. Kidder,L.H. dan Judd,C.M.,(1986) Research Methods in Social Relations, 5th edition, HRW International
- 5. May, T. (1993) Social Research, Open University Press, Buckingham
- 6. Shipman, M., (1981) The Limitations of Social research, 2nd edition, Longman
- 7. Marsden, D. dan Oakley, P. (eds),(1990) Evaluating Social Development Projects, Oxfam, Oxford
- 8. Tacq, J., (1997) Multivariate Analysis Techniques in Social Science Research, Sage Publications, London
- 9. de Vaus, D.A., (1986) Surveys in Social Research, George Allen and Unwin, Boston
- 10. Kamaruddin Ngah (1988) Kaedah Penyelidikan: Panduan Mudah Kerja Luar, Fajar Bakti

RPK 334 – Traffic and Transportation Planning

This undergraduate seminar course reflects various social issues related to the development field, generally, and in the field of housing, building and planning, specifically. In general, discussions with sociological tinge will be conducted such as: social change and social planning; social and physical development, relationship between the two social issues and questions related to housing and community planning; social aspects of urban structure. Measurement of social cost and benefit, contribution of social indicators, from the perspective of social change and their usage in the fields of housing and planning. Students are required to choose from a selected few topics, within the Malaysian context, for their seminar paper presentation purposes.

Learning Outcome:

- (i) Identify the concepts, principles and processes of traffic and transportation planning in the context of socio-economic-political dimensions of the city and region.
- (ii) Investigate the dynamic planning process and identify trends that shape and influence the planning structure and activity using traffic management techniques and urban and regional transport, and assess development trends over time and space.
- (iii) Relate and predict the implications of planning policy and development associated with travel and mobility, human settlement, employment, land use and local economic development.
- (iv) Present the findings of the analysis and discuss the issues and problems of traffic and urban and regional transport from a holistic perspective to propose the best strategy over time.
- (v) Review the role of the stakeholders involved in the planning process through a study of traffic and transportation with team members at site.

References

- 1. Conyers, Diana (1982). Introduction to Social Planning in the Third World, John Wiley, New York.
- Stein, Jay M. (ed) (1995). Classic Readings in Urban Planning, McGraw-Hill Inc. New York.
- 3. Hardy, Dennis (1991). From Garden Cities to New Towns, Chapman & Hall, London.
- 4. Hardy, Dennis (1991). From New Towns to Green Politics, Chapman & Hall, London.
- 5. Goh, Ban Lee (2002). Non –Compliance A Neglected Agenda in urban Governance, Institute Sultan Iskandar, Skudai, Johor.

RPK 343 – Social Aspects in Planning

This course focuses on various social issues related to land development in general, and in the field of housing, building and planning, specifically. In general, discussions with sociological tinge will be conducted such as: social change and social planning; social and physical development, relationship between the two social issues and questions related to housing and community planning; social aspects of urban structure. Measurement of social cost and benefit, contribution of social indicators, from the perspective of social change and their usage in the fields of housing and planning will be conducted. Students are required to choose from a selected few topics, within the Malaysian context, for their seminar paper presentation purposes.

Learning Outcomes

At the end of the course students will be able to:

- (i) Describe and understand the dimensions of social planning and development.
- (ii) Explore and identify the subjects related to social planning evolution from developed world exeriences.
- (iii) Balance physical development with social development in city planning focusing on sustainable development concept.
- 1. Conyers, Diana (1982). *Introduction to Social Planning in the Third World*, John Wiley, New York.
- 2. Stein, Jay M. (ed) (1995). *Classic Readings in Urban Planning*. McGraw-Hill Inc. New York.
- 3. Hardy, Dennis (1991). From Garden Cities to New Towns. Chapman & Hall, London.
- 4. Hardy, Dennis (1991). From New Towns to Green Politics. Chapman & Hall, London.
- 5. Goh, Ban Lee (2002). Non –Compliance A Neglected Agenda in urban Governance. Institute Sultan Iskandar, Skudai, Johor

RPK 351 – Urban and Regional Economics

This course focuses on concept and theories of urban and regional economy and their application to urban and regional spatial structure. Students will be introduced to methods in economic analysis of urban and regional growth, and evaluation of economic impacts of urban and regional development. Further explanation will focus on the development of strategies and policies for urban and regional development.

Learning Outcomes

At the end of the course, students will be able to:

- (i) Explain theories and concepts of urban and regional economics
- (ii) Apply analytical methods for urban and regional economics for alternative solutions.
- (iii) Analyse the economic growth of cities and regions as well as the issues and problems in structural and spatial context.
- (iv) Establish policies and strategies for urban and regional development.

References

- 1. Richardson, H.W., Pitman. (1979). Regional and Urban Economics.
- 2. McCann, Philip, Oxford University Press. (2001). Urban and Regional Economics.
- 3. O'Sullivan, A., Irwin. (1996). Urban Economics.
- 4. Ghani Salleh, Utusan Publication & Distributors. (2000). Urbanisation and Regional Development in Malaysia..
- 5. Mills, E.S. and Hamilton, B.W., Harper Collins. (1994). Urban Economics.
- 6. Button, K.J., Macmillan Press. (1981). Urban Economics: Theory and Policy.

RMK 357 – Land Administration

This course aims to introduce the students to the current practices of land administration in Malaysia and to give an understanding to them about various issues that are related with land administration especially on its implication to property market and development process.

Learning Outcome:

- (i) Understand issues associated with the land administration system in Malaysia.
- (ii) Explain and discuss the need for effective and efficient land administration systems.
- (iii) Understand and analyse a range of procedures and documentations of the state role over land.
- (iv) Acknowledge and aware of the legal environment affecting land administration.

References

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- 2. Ahmad Ibrahim dan J. Sihombing (1989). The Centenary of The Torrens System In Malaysia, Malayan Law Journal.
- 3. Das, S.K.(1963). The Torrens System In Malaya, Singapore: Malayan Law Journal Ltd.
- 4. Jabatan Tanah Dan Galian Persekutuan (1980). Buku Panduan Pentadbiran Tanah.
- 5. Mohd Salleh Abbas (1968). Prinsip Perlembagaan dan Pemerintahan Di Malaysia. Kuala Lumpur, Dewan Bahasa dan Pustaka.
- 6. Ridzuan Awang (1994). Undang-undang Tanah Islam: Pendekatan Perbandingan. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- 7. Salleh Buang (2007). Malaysian Torrens System. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- 8. Sihombing, J.E. (1999). National Land Code: A Commentary. Singapore/Kuala Lumpur: Malayan Law Journal.
- 9. Teo Keang Sood (1993). Hak Milik Strata Di Malaysia. Dewan Bahasa dan Pustaka, Kuala Lumpur.
- 10. Teo and Khaw (1995). Land Law in Malaysia; Cases and Commentary. 2nd Edition. Malaysia: Butterworth.
- 11. Wong, David, S.Y.(1975). Tenure And Dealings In The Malay States. Singapore University Press.
- 12. Pekeliling semasa Pentadbiran Tanah Persekutuan. www.kptg.my
- 13. National Land Code 1965 (Act 56) and Regulations. MDC Publishers Sdn. Bhd. Amendments up to 15 October 2010.
- 14. Land Acquisition Malaysia. International Law Book Services.
- 15. Federal Constitution. As at 5th January 2012. International Law Book Services.

RPK 359 – Planning Law

The central focus of the course is the provisions of the Town and Country Planning Act 1976 providing the enabling powers to make plans, control development and administer the planning machinery which supports the activity of town planning. Other laws, in particular the Federal Constitution, National Land Code 1965, environmental laws and administrative laws will be discussed in relation to how it affects town planning. In particular, this course is concerned with how planning decisions must fulfill various legal doctrines and principles for good governance and good decision-making with reference to mandates to protect and enhance resources in line with sustainable development

principles. Case studies from planning case law will form a major component of the teaching method in this course to critically examine the questions posed in the course outline.

Learning Outcome:

- (i) Understand the doctorine and principles of law and jurisprudence.
- (ii) Explain the legal basis for the conduct of urban planning.
- (iii) Apply the principles of compliance with urban planning laws.
- (iv) Evaluate and interpret the results of court cases related to urban planning.

References

- 1. Desmond Heap, (1996). An Outline of Planning Law. London : Sweet and Maxwell.
- 2. Salleh Buang, (1992). Malaysian Torrens System. KL : Dewan Bahasa & Pustaka
- 3. AE Telling and RMG Duxbury, (1993). (9th Edition), Planning Law and Procedure, London : Butterworths
- 4. J Cameron Blackhall, Planning Law and Practice, (1998). London : Cavendish Publishing Ltd.
- 5. Lee Lik Meng, Abdul Mutalip and Alip Rahim, (1990). Town Planning in Malaysia – History and Legislation. USM – monograph.

RPK 439 – Professional Practice in Urban Planning

The course is carried out in 1 semester in a duration of 14 weeks of lecture. It include professional work ethics, service and responsibilities, legal aspect, office management, consultancy, project management and investment. Teaching approached are towards a wider scope of discipline as practiced by a professional Urban Planner. These involved several aspects of development sectors such as property development, socio-economy, industries, tourism, agriculture, engineering, architecture and recreation. To achieve this goal, the course outline will be related to the current professional urban planning practices in Malaysia and being recognized to be applicable at the national and international level. The teaching components that have been introduced have taken into account other professional discipline such as engineering and architecture and should be applicable to fulfill the standards and requirement of a recognized practicing urban planner. Contract management system, appointment of consultants, job specifications, finance, work ethics, planning submission and corporate system of private and public sectors are also being introduced. Teaching approached are by lectures, expert lecture, workshop and academic field trip.

Learning Outcome:

- (i) Identify and understand the principles and mechanism of the development process and implementation approach based on best practices in Malaysia and abroad.
- (ii) Assess the implications of adopted regulations and guidelines and obtain feedbacks from various aspects of the development components and be accountable for each action.

- (iii) Provide justifications based on ethics and codes of best practice in urban planning and other fields of consultation
- (iv) Analyse and compare between urban planning best practices and success stories.
- (v) Develop new and innovative ideas for universal design.

- 1. Rancangan Fizikal Negara
- 2. Laporan Dasar Perbandaran Negara, 2006
- 3. Manual Piawai Perancangan ,Jabatan Perancang Bandar & Desa, Ibu Pejabat.
- 4. Akta Perancang Bandar dan Desa, 1976, Akta 172
- 5. Akta Perancang Bandar, 1995, Akta 538
- 6. Stephen Harris,1989, 'Town Improvement & Tourism-A Case Study of Eden and Twofold Bay' 'An Environmental Planning & Management Series ,Vol 8
- 7. Jabatan Percetakan Nasional Bhd, Akta Perancangan Bandar dan Desa, Akta 172 (Pindaan) ,1995
- 8. Manuel Baud-Bovy and Fred Lawson. (1998). *Tourism and Recreation Handbook of Planning and Design*, Reed Educational & Publishing Ltd, Oxford
- 9. Edward J.Kaiser, David R.Godschalk, F.Stuart Chapin. Jr. (1995) Urban Land Use *Planning*, Univ. of Illinois Press, Chicago.
- 10. Cliff Moughtin.(1999) Urban Design Street and Square, Plant & Trees Press, Oxfoxd. [P711.4237A]
- 11. Chris Couch. (1990) Urban Renewal Theory and Practice, Macmillan Edu.Ltd.

RPS 409 – Planning Studio 5

Studio project emphasizes the use of planning concept, methodology and process to produce a development plan, such Special Area Plan for any area as required by Town and Country Planning Act 1976 (Act 172). Lay-out, implementation and action plans are generated based on comprehensive analysis of physical, social, economic and environmental issues and problems.

Learning Outcome:

- (i) Understand the principles, methodology and planning process to produce development plans, such as the Local Plan and Structure Plan for an area.
- (ii) Identify planning issues and problems in a holistic approach, including physical, social, economic and environment aspects through teamwork.
- (iii) Apply analytical methods to solve problems as a planning team.
- (iv) Prepare program implementation, action plan and development strategy of an area.

- 1. Jabatan Perancang Bandar dan Desa Negeri Pulau Pinang (2007) Rancangan Struktur Negeri Pulau Pinang 2020, Pulau Pinang: JPBD.
- 2. Federal Department of Town and Country Planning Malaysia (2005). National Physical Plan, Kuala Lumpur: JPBD.
- 3. Jabatan Perancang Bandar dan Desa Semenanjung Malaysia (2003) Garis Panduan dan Piawaian Perancangan: Reka Bentuk Imej Bandar, Kuala Lumpur: JPBD.
- 4. Jabatan Perancang Bandar dan Desa Semenanjung Malaysia (2008) Akta 172: Akta

Perancangan Bandar dan Desa 1976, Kuala Lumpur: JPBD.

5. Majlis Perbandaran Pulau Pinang (2008) Dasar-Dasar dan Garispanduan, Pulau Pinang: MPPP.

RPK 472 – Urban and Regional Planning Research Project

Urban and Regional Planning Research Project is a starting point for interior design students to get involved in specific research areas. The research conducted is a test to evaluate students' understanding of the courses or subjects that have been followed in the urban and regional planning program throughout the academic year, as well as to train the students to master the right techniques of writing a thesis and the process of conducting a research based on the writing system that is required by the university and the urban planning professional bodies. Moreover, it is also a turning point for the students to get familiar with the writing skill, which is very important in their career life after graduation. Thus the process of research and writing will help students to gather information for any matters relating to writings.

Learning Outcome:

- (i) Conceptualise the research process at an early stage, including data collection techniques and selection of topic that is relevant to issues and theories of urban and regional planning in Malaysia.
- (ii) Formulate and propose research methodology that is appropriate to the research title.
- (iii) Conduct data collection utilising intrapersonal skills.
- (iv) Analyze data and report results of analysis.
- (v) Prepare a dissertation in accordance with the graduation requirements using information technology/multimedia.
- (vi) Conduct oral presentation and explain research findings during viva-voce.

- 1. Bryman, A., (1988). Quantity and Quality in Social Research, Unwin Hyman, London.
- Bulmer, M., Warwick, D.P., (1983). Social Research in Developing Countries; Survey and Censuses in The Third World. John Wiley & Sons Ltd., Chichester, U.K
- 3. Bulmer, M., (1984). Sociological Research Methods, Macmillan London.
- 4. Casley, D.J. and Lury, D.A., (1984). Data Collection in Developing Countries. Claredon Press, Oxford, U.K
- 5. Moore, G.T., Tuttle, D.P., & Howell S.C., (1985). Environmental Design Research Directory, Praeger, New York.
- 6. Nachmias, D. & Nachmias, C.F., (1992). Research Methods in the Social Science, St. Martin Press, U.K.
- 7. Patton, M., (1990). Qualitative Evaluation and Research Methods, Sage Publication, London
- 8. Peil, M., (1982). Social Science Research Method, Hodder and Stoughton, London
- 9. Pocock, D., (1978). Images of the Urban Environment, Columbia University Press,

New York.

- 10. Turabian, K. (2007). A Manual for writers of Term papers, Thesis and dissertation (7th Edition), Univ. of Chicago Press, Chicago, U.S.A.
- 11. White, E., (1983). Site Analysis: Diagramming Information for Architectural Design, Architectural Media, USA.
- Yin, R., (1989). Case Study Research & Methods, Sage Publications, London. Zeisel, J., (1984). Inquiry by Design, Tools for Environmental Behaviour Research, Monterey, California.

RPK 435 – Regional and Rural Planning

The course explores the concepts of regional and rural planning while addressing the issues of regional inequality, rural economic development and rural sustainability. Methods of analysis are employed to investigate regional and rural growth and to evaluate economic impact. Application of regional and rural development theories and evaluation of balanced development concept. Formulation of regional and rural growth strategies and policies that are balanced in terms of economy, rural and environmental sustainability.

Learning Outcome:

- (i) Understand the concepts and theories of regional and rural planning.
- (ii) Explain the processes that shape and influence the planning and development of regions and rural areas.
- (iii) Synthesise the growth of regions and rural areas by studying regional imbalances, economic impact and sustainability of rural development.
- (iv) Formulate policies and strategies for regional and rural area development with a balance of sustainable economy, rural area and the environment.

- 1. D. Barry Dalal-Clayton, David Dent, Olivier Dubois (2003), *Rural Planning in Developing Countries*, Earthscan
- 2. Daniels, T. (2007), The Small Town Planning Handbook, APA Planners Press
- 3. Arendt, R. (1994) *Rural by Design; Maintaining Small Town Character*, APA Planners Press
- 4. Andres Duany, Jeff Speck, Mike Lydon (2009), *The Smart Growth Manual*, McGraw-Hill Professional
- 5. Bendavid-Val, A. (1991) *Regional and Local Economic Analysis for Practitioners*, 4th Edition, Prager: New York.
- 6. Ahris Yaakup (penterjemah) J. Glasson (1990) *Pengenalan Perancangan Wilayah*, DBP: Kuala Lumpur.
- 7. Abdul Mutalib Abdullah dan Abdul Ghani Salleh (Penterjemah) H.W. Richardson (1993) *Ekonomi Wilayah dan Bandar*, DBP: Kuala Lumpur
- 8. Cloke, P.J. (1979) Key Settlement in Rural Areas, Methuen: London.
- 9. Ghani Salleh (2000) *Urbanisation and Regional Development in Malaysia*, Utusan Publications and Distributors: Kuala Lumpur
- 10. Spinager, D (1986) Industrialisation Policies and Regional Economic Development in Malaysia, OUP:Singap

4.7.6 Courses in Interior Architecture

RDS 201 - Interior Architecture Studio 1

This course stresses on the proper planning of interior space from various space categories such as commercial, institutional, hospitality, residential facilities. The training to manage projects is introduced to the students to strengthen the students' knowledge in preparation for the practical training at the end of the semester. The exposure is undertaken to fulfill the working market requirements.

Learning Outcomes

At the end of the course students will be able to:

- (i) Identify the hiearchy of space and the interior design elements
- (ii) Apply the understanding of design skills and team work.
- (iii) Differentiate the level of solving problems in accordance to the types of projects, starting from concept, space planning until presentation.

References

- 1. Francis D. K. Ching, (2012), 3rd. ed., Interior Design Illustrated, New Jersey: John, Wiley & Sons Inc.
- 2. Francis D. K. Ching, (2014), 4th. ed., Architecture: Form, Space, and Order, New Jersey: John, Wiley & Sons Inc.
- 3. Hunt Slonem, (2014), When Art Meets Design, London: Assouline Publishing.
- 4. Maureen Mitton, (2012), 4th. ed., Interior Design Visual Presentation: A Guide to Graphics, Models and Presentation Techniques, New Jersey: John, Wiley & Sons Inc.
- 5. Susan J. Slotkis, (2012), 2nd. ed., Foundations of Interior Design, New York: Fairchild Books.

RDS 202 - Interior Architecture Studio 2

This course stresses on the proper planning of interior space from various space categories such as commercial, institutional, hospitality, residential facilities. The training to manage projects is introduced to the students to strengthen the students' knowledge in preparation for the practical training at the end of the semester. The exposure is undertaken to fulfill the working market requirements.

Learning Outcomes

At the end of the course students will be able to:

- (i) Link human factor, physical factor and emotional factor in interior design.
- (ii) Give respond to space and human senses.
- (iii) React with design environment more effectively

- 1. Linda O'Shea, et.al, (2013), reprint ed., The Interior Design Reference & Specification Book: Everything Interior Designers Need to Know Every Day, Minneapolis, MN: Rockport Publishers.mm
- 2. Lydia Cline, (2012), SketchUp for Interior Design: 3D Visualizing, Designing, and Space Planning, New Jersey: John, Wiley & Sons Inc.
- 3. Martyn Thompson, (2012), Interiors, London: Hardie Grant Books.
- 4. Richard Mishaan and Judith Nasatir, (2014), Artfully Modern: Interiors, New York: The Monacelli Press.
- 5. Wim Pauwels, (2014), Timeless Architecture & Interiors, Enghien, Belgium: Beta-Plus Publishing.

RDB 217 – Exhibition and Display

This course is a 100% course work. Its aim is to introduce the students to the principles of designing an exhibition as well as techniques of displaying objects. The design aspects include theory, concept, function, exhibition categories, planning, special effect techniques, art installation and techniques to present ideas through construction works.

Learning Outcomes

At the end of the course students will be able to:

- (i) Apply the principles of display design in interior design.
- (ii) Appreciate the different aspects of design display, including theory, concept, function and exhibition categories.
- (iii) Apply the arts of display and the technique of presentation which is infused through technical drawings.

References

- 1. Morgan, C.L. (1997). Expo: Trade Fair Stand Design. New York: RotoVision.
- 2. Boschi, A. (ed.). (2001). *Showrooms*. London: teNeues.
- 3. Retail Interiors (Interior Design Library). (1998). Gloucester: Rockport Publishers.
- 4. *Visual Merchandising*. (2002). Cincinnati: Media Group International.
- 5. Manroe, C.O. (1997). *Uncluttered: Storage Room by Room*. New York: Friedman/Fairfax.
- 6. Rikuyosha, (2013), Display, Commercial Space & Sign Design, Tokyo: Azur Corporation

RDG 235 – Ergonomics

The human factors of man, physical and emotional. Examination of how human senses are affected by space, form, colour, light, sound and motion. Study of the ecology of man and how tools, products and systems affects his behaviour and environment.

Learning Outcomes

At the end of the course students will be able to:

- (i) Incoorporate humanfactors, physical and emotion into interior spaces.
- (ii) Respond to the space and human sense.
- (iii) Respond to the design environment more effectively.

References

- G. Salvendy (2012), Handbook of Human Factors and Ergonomics. 4th Edition, John Wiley & Sons, Hoboken, New Jersey
- 2. Kroemer, K. H. E and Grandjean, E. (2003), Fitting the task to the Human, A textbook of Occupational Ergonomics, fifth edition, Taylor and Francis.
- 3. Stephen, P. (2002), Body space: Anthropometry, Ergonomics and Design of Work, Second Edition, Taylor & Francis
- 4. Bridger, R. S. (2009), Introduction to Ergonomics, 3rd Edition, CRC Press
- 5. Panero, J &Zelnik, M. (1979), Human Dimensions & Interior Space, Whitney library of Design
- 6. D. Maclead (1995), The ergonomics Edge, Van Nostrand Reinhold

RDB 263 Interior Architecture Detailings and Finishes

The course is the continuation from Building Construction 1. It will emphasize the detailing and construction for interior design. The scope includes building system, renovations, materials, detailing for finishes inclusive of floors, walls, ceilings and vertical circulations. Soft furnishings are also emphasized. Renovations, partitions are inclusive for wall detailing.

Learning Outcomes

- (i) Selecting and presenting the suitability of types of finishing materials/finishings in the building system of building design by utilising entrepreneurial knowledge/skills in solving sustainability issues.
- (ii) Elaborating types of materials, components, and systems details of the construction of building design.
- (iii) Illustrating thinking/cognitive/reasoning skills in analyzing types of finishing materials/ finishings in the construction of building design to produce the best outcome and decision with an effective cost.

- 1. Corky Binggeli, (2011), Interior Graphic Standards: Second Edition, Hobeken, New Jersey: John, Wiley & Sons Inc.
- 2. David Kent Ballast, (2011), Interior Construction & Detailing for Designers and Architects, Belmont: Professional Publications.
- 3. Lisa Godsey, (2012), 2nd. ed., Interior Design Materials and Specifications, New York: Fairchild Books.
- 4. Lorraine Farrelly, (2012), Materials and Interior Design, London: Laurence King

Publishing Ltd.

5. Michael Forsyth and Lisa White, (2011), Interior Finishes and Fittings for Historic Building Conservation, Hoboken, NJ: Wiley-Blackwell.

RDS 301 – Interior Design Studio 3

This course offers continuous understanding of current technological theory, current market demand and services in design aspects. Elements such as structures, construction, design details and application techniques are emphasised. Each project stresses on concept development, methods and systematic solutions. Proposed project includes commercial and institutional designs which are more realistic. The course objectives are as follows:

- (i) To understand Green Building index (GBI) and Universal Design (UD) in architecture and interior design.
- (ii) To explore various concepts of design and space planning.
- (iii) To be able to design furniture.
- (iv) To be able to estimate design and construction costs.

Learning Outcomes

- (i) Explaining and applying Green Building Index (GBI) and Universal Design (UD) in interior architecture planning.
- (ii) Explaining clearly the form, space, function, and interior themes in the proposal of designing commercial or institutional buildings.
- (iii) Proposing the construction of interior space of commercial or institutional buildings and being able to draft business/entrepreneurial planning.
- (iv) Displaying communication and teamwork capabilities.

- 1. Zevon, S. (1997). Inside Architecture. Rockport: Mitchell Beazley.
- 2. Pegler, M. (1992). Storefronts & Facades. New York: Retail Reporting.
- 3. Pegler, M. (2001). Stores of the Year. New York: Visual Reference.
- 4. Cook, P. & George Rand. (1989). *Morphosis*. New York: Rizzoli.
- 5. Visual Merchandising. (2002). Cincinnati: Media Group International.
- 6. Retail Interiors. (1998). Gloucesterr: Rockport.
- 7. Andreini, L. ed. (2000). *Cafes & Restaurants*. Kempen: teNeues Verlag GmbH + Co KG
- McGowan, M. (2004). *Interior Graphic Standards*: Student Edition. New Jersey: John Wiley & Sons, Inc.
- 9. Piotrowski, C. (2004). *Becoming an Interior Designer*. New Jersey: John Wiley & Sons, Inc.
- 10. Hannah, B. (2004). *Becoming a Product Designer*. New Jersey: John Wiley & Sons, Inc.
- 11. Gordon, G. (2003). Interior Lighting for Designers. New Jersey: John Wiley & Sons, Inc.
- 12. Christine M. Piotrowski, (2011), Problem Solving and Critical Thinking for Designers, New Jersey: John, Wiley & Sons Inc.

RDS 302 – Interior Design Studio 4

This course is a comprehensive schematic project inclusive of design theories, concept and costing. Its aims is to test the students' ability as interior designer. Projects undertaken lean heavily on the students' interests. Interior design projects considered are those with an area of not less than 25,000 sq. ft. Students are encouraged to communicate with actual clients. Hence, the students are guided in preparing their portfolios.. The course objectives are as follows:

- (i). To understand all design theories and concepts related to interior design themes.
- (ii). To enhance knowledge in building technologies and services..
- (iii). To express spatial relationships and finished materials.
- (iv). To produce scaled models of proposed interior design.
- (v). To express and offer wide variety of activities and spaces.
- (vi). To be able to communicate with various professionals involved in interior design.
- (vii). To be able to display and present interior design proposals.
- (viii). To be able to complete a schematic project which covers all aspects of interior design from space planning, design solution to detailed constructions and project costing.

Learning Outcomes

- (i) Explaining and applying design concepts and interior architecture planning
- Unraveling and explaining clearly aspects of cultural heritage in interior design, interior landscape, construction materials, finishings, furniture, and the lighting of interior architecture.
- (iii) Proposing the cost of design and the construction of interior based on space, function, and interior design landscape.
- (iv) Displaying communication and teamwork capabilities that subsequently nurture leadership skills.

- 1. Zevon, S. (1997). Inside Architecture. Rockport: Mitchell Beazley.
- 2. Pegler, M. (1992). Storefronts & Facades. New York: Retail Reporting.
- 3. Pegler, M. (2001). Stores of the Year. New York: Visual Reference.
- 4. Cook, P. & George Rand. (1989). Morphosis. New York: Rizzoli.
- 5. Visual Merchandising. (2002). Cincinnati: Media Group International.
- 6. Retail Interiors. (1998). Gloucesterr: Rockport.
- 7. Andreini, L. ed. (2000). *Cafes & Restaurants*. Kempen: teNeues Verlag GmbH + Co KG
- 8. McGowan, M. (2004). *Interior Graphic Standards*: Student Edition. New Jersey: John Wiley & Sons, Inc.
- 9. Piotrowski, C. (2004). *Becoming an Interior Designer*. New Jersey: John Wiley & Sons, Inc.
- 10. Hannah, B. (2004). *Becoming a Product Designer*. New Jersey: John Wiley & Sons, Inc.
- 11. Gordon, G. (2003). Interior Lighting for Designers. New Jersey: John Wiley & Sons, Inc.
- 12. CREAM (2012). Guide to Green Building Design in Malaysia. Kuala Lumpur: Construction Research Institute of Malaysia (CREAM).

RDB 314 – Design Management

The emphasis of this course is on the understanding of materials and technology, their uses, sources and their relation to interior architecture. It stresses the responsibility of the designer to adapt to evolving technologies to his needs from the early process of designing until the product/design is marketed/implemented.

Learning Outcomes

At the end of the course students will be able to:

- (i) Correlate the whole process of product development from idea generation, product specification, communication, product status, until completion.
- (ii) Respond to various characteristics of creativity and the creative individuals.
- (iii) Differentiate the characteristics of bad product or product failure effectively.

Reference

- 1. T.Levitt (1986), *The Marketing Imagination*. Macmillac Inc.
- 2. Hollins, B & Pugh Stuart, (1990), *Successful Product Design*. Butterworth & Co. Ltd.
- 3. Baxter, (1995), Product Design. Practical Methods for the Systematic Development of New Products. Chapman & Hall, London.
- 4. Majaro,S. (1992), *Managing Ideas for Profit: The Creative Gap*. McGraw-Hill Interim Ltd
- 5. CIPD. Center for Innovative in Products Development. http://web/mit.edu/cipd/

RDG 313 – Design Workshop

This course expands by visual awareness, developing visual techniques and tools for research and designing in black and white. Practical training and assignments include design and execution of a n appropriate communication covering formal, functional and technical solutions to design problems. The emphasis is on presentation, materials, methods, form and design development. The course comprises of tehniques and process of design in 2-D presentations. The course objectives are as follows:

Learning Outcomes

At the end of the course students will be able to:

- (i) To enhance the interior design studio presentation in black and white.
- (ii) To understand tones, hues, shades and shadows.
- (iii) To expose the students to interior design presentation.
- (iv) To know how to communicate graphically through means of rendering, sketching and drawing.
- (v) To understand rendering and exploiting it through the creation and the setting of mood, environment, ambience and identity of a space in black and white.
- (vi) To understand materials through black and white rendering.
- (vii) To be able to communicate verbally in enhancing the graphic communication ability.

- 1. Ching, Francis D.K. (1979). *Architecture: Form, Space & Order*. New York: Van Nostrand & Reinhold.
- 2. Kautzky, Ted. (1979). *The Ted Kautzky Pencil Book*. New York: Van Nostrand & Reinhold.
- 3. Levinson, Frances. (1983). *Architectural Rendering Fundamental*. Miami: Mc Graw Hill.
- 4. O'Connell, William. (1985). *Graphic Communications in Architecture*. Champaign: Stipes.
- 5. Portet, Tom & Sue Goodman. (1982). *Manual of Graphic Techniques 2*. New York: Scribners.
- 6. Simmons III, Seymour & Marc S.A. Winer. (1977). *Drawing: The Creative Process*. New Jersey; Prentice Hall.

RDG 323 – Design Presentation Techniques

This course exposes the students to coloured presentation techniques that are available and applicable in market. It stresses on various media that are applied by interior designers as tools for presentation. The media applied are coloured pencil, watercolour, marker, computer enhanced and computer generated presentation, in producing final presentations. These skills enhance the creative thinking in designing. The course objectives are as follows:

Learning Outcomes

At the end of the course students will be able to:

- (i) To enhance the interior design studio presentation in colour.
- (ii) To understand colours, tones, hues, shades and shadows.
- (iii) To expose the students to interior design presentation.
- (iv) To know how to communicate graphically through means of colour rendering, sketching and drawing.
- (v) To understand rendering and exploiting it through the creation and the setting of mood, environment, ambience and identity of a space in colour focusing on texture, materials and finishes.
- (vi) To understand materials through colour rendering
- (vii) To be able to communicate verbally in enhancing the graphic communication ability.

- 1. Ching, Francis D.K. (1979). *Architecture: Form, Space & Order*. New York: Van Nostrand & Reinhold.
- 2. Kautzky, Ted. (1979). *The Ted Kautzky Pencil Book*. New York: Van Nostrand & Reinhold.
- 3 Levinson, Frances. (1983). *Architectural Rendering Fundamental*. Miami: Mc Graw Hill.
- 4. O'Connell, William. (1985). *Graphic Communications in Architecture*. Champaign: Stipes.
- 5. Portet, Tom & Sue Goodman. (1982). *Manual of Graphic Techniques 2*. New York: Scribners.

- 6. Simmons III, Seymour & Marc S.A. Winer. (1977). *Drawing: The Creative Process*. New Jersey; Prentice Hall.
- 7. Carter, David. (1998). The Complete Paint Book. London: Conran Octopus.
- 8. Roddon, Guy. (1995). *Pastel Painting Techniques*. London: Burlington.
- 9. Drpic, Ivo D. (1988). Sketching and Rendering Interior Spaces. New York: Whitney.

RDG 334 – Theory and History of Design

The course covers the development of interior design from an early date to the present. The course aims to introduce and explore different theoretical perspectives on contemporary society and culture to examine historical issues relevant to the production of Interior Design and related fields. It also aims to develop the student's intellectual and critical awareness to enable students to become familiar with information sources, and develop their research and design ability.

Learning Outcomes

At the end of the course students will be able to:

- (i) Explore the distinctive theoretical perspectives in the contemporary society and their culture which are relevant to interior design.
- (ii) Link the social, cultural and political events in interior design in accordance with the period of occurrence.
- (iii) Have critical awareness on how design effects the society and their culture.
- (iv) Understand the contemporary design and the role of designers in pioneering local design culture.

References

- 1. Sparke, P. (1987) *Design in Context*. Quarto Publishing plc.
- 2. Doordan, D.P. (1995). Design History; an Anthology. The MIT Press.
- 3. Sparke, P. (1986). An Introduction to Design & Culture in the Twentieth Century. Routledge, London.
- 4. Sir Banister Fletcher, (1996). *A History of Architecture*. 20th Edition, Architectural Press
- 5. Moffet, M, Fazio, M & Wodehouse, L. (2003). *A World History of Architecture*. Laurence King Publishing.
- 6. Blakemore, R.G. & Rabun, J.L. (1997). *History of Interior Design and Furniture: From Ancient Egypt to Nineteeth-Century Europe*. John Wiley and Sons, Inc.

RDG 336 – Professional Practice for Interior Architecture

The course introduces the creative potential of designing related to interior architecture. Exposure to the aspects of professionalism of interior design : the Architect Act 1967, the registration of Professional Interior Designer with L.A.M. and the professional code of conduct of behaviour and responsibility, the work scope of the society, and professional fees; the appointment and relationship with clients, consultants and contractors. It emphasises administrative, legal and financial aspects of Interior Design Practice. Projects will be designed to challenge pre-conceptions, release creative potential, develop analytical thinking and co-operative working environment.

Learning Outcomes

At the end of the course students will be able to:

- (i) Understand the professional relationship of interior design with the other professions working as a team.
- (ii) Respond to the need of understanding of rules and by-laws which are related with contact documentation.
- (iii) Plan and execute the scope of interior design services including fees and compensations.

References

- 1. Roland Ashcroft, (1992). Construction for Interior Designers.
- 2. Victor Papanek, (1995). *The Green Imperative*.
- 3. Pearson D., (1989). The Natural House Book.
- Piotrowski, Christine M. (2001). Professional practice for interior Designers- 3rd Ed. New York: John Wiley & Sons, Ltd.
- 5. H.Siegel, (1982). A Guide to Business Principles and Practicesfor Interior Designer.
- 6. Roland Ashcroft, (1992). *Construction for Interior Designers*.
- 7. Victor Papanek, (1995). The Green Imperative.
- 8. Pearson D., (1989). The Natural House Book.
- 9. H.Siegel, (1982). A Guide to Business Principles and Practices for Interior Designer.
- 10. L.A.M. Lembaga Arkitek Malaysia. http://www/LAM.gov.my/

RDG 366 – Furniture Design

Furniture is one of the important component in the interior design field. This course will assist students' understanding in designing the furniture, trend in design and the relevant history for the design of furniture in relation to the ways of completing the design process.

Learning Outcomes

At the end of the course students will be able to:

- (i) Understand the methods of choosing appropriate furniture including arbitrating the appropriate function, technology, manufacturing, presentation, visual and safety to the clients.
- (ii) Display the skill of choosing the appropriate type of furniture.
- (iii) Acquire the basic knowledge regarding materials, technique and the trend of traditional, eastern and western style of furniture.

- 1. Kilmer, W.O. & Kilmer, R. (2003) *Construction Drawings and Details for Interiors*. John Wiley & Sons.
- 2. Pile, J. (2005) A History of Interior Design. Laurence King Publishing's. Second Edition.
- 3. Richard T. Bynum & Danial L. Rubino (1998). *Handbook of Alternative Materials in Residential Construction*. Mc-Graw-Hill.

- 4. Byars, M. (2005), The Best Tables, Chairs and Lights. RotoVision.
- 5. Fuad-luke, A. (2004). *The Eco-Design Handbook*. Thames abd Hudson. New Edition.
- 6. Saville, L. (2006). Design Secrets: Furniture., Rockport Publishers.

RDS 401 Interior Architecture Studio 5

Students are given the freedom to choose the theme of their interest. They are guided in ensconcing the necessary process, elements and principles in the comprehensive project. Horizontal and vertical circulations for users are inclusive in the space planning layout. The course accentuates the social, cultural, sustainability and the universal needs. The course is in parallel with the Dissertation Course which focuses on research and fact findings on the chosen site, as well as critical analyzing in achieving the comprehensive solution.

Learning Outcomes

- (i) Translate the schematic projects comprehensively
- (ii) Design comprehensive projects starting from concept until cost presentations
- (iii) Display confidence and professionalism
- (iv) Built potential design while exploring wider scope

RDL 470 Interior Architecture Topical Studies

Interior Architecture Topical studies writing is a starting point for interior design students to get involved in specific research areas. The research conducted is a test to evaluate students' understanding of the courses or subjects that have been followed in the interior design program throughout the academic year, as well as to train the students to master the right techniques of writing a report and the process of conducting a research based on the writing system that is required by the university and the interior design professional bodies. As we all know the research conducted in this topical study is a continuation of the design studio, where all the data and information collected and discussed in this topical study can help the students in the design process and thus can support the design report writing on the whole. Moreover, it is also a turning point for the students to get familiar with the writing skill, which is very important in their career life after graduation. Thus the process of research and writing will help students to gather information for any matters relating to writings.

Learning Outcomes

- (i) Organising research and forming established solutions with regards to research findings
- (ii) Displaying ethical behavior in research outcomes
- (iii) Linking information as well as embracing new ideas systematically
- (iv) Able to defend arguments in presentation outcomes based on research findings and project spearheading

- 1. Bryman, A., (1988). Quantity and Quality in Social Research, Unwin Hyman, London.
- Bulmer, M., Warwick, D.P., (1983). Social Research in Developing Countries; Survey and Censuses in The Third World. John Wiley & Sons Ltd., Chichester, U.K
- 3. Bulmer, M., (1984). Sociological Research Methods, Macmillan London.
- 4. Casley, D.J. and Lury, D.A., (1984). Data Collection in Developing Countries. Claredon Press, Oxford, U.K
- 5. Moore, G.T., Tuttle, D.P., & Howell S.C., (1985). Environmental Design Research Directory, Praeger, New York.
- 6. Nachmias, D. & Nachmias, C.F., (1992). Research Methods in the Social Science, St. Martin Press, U.K.
- 7. Patton, M., (1990). Qualitative Evaluation and Research Methods, Sage Publication, London
- 8. Peil, M., (1982). Social Science Research Method, Hodder and Stoughton, London
- 9. Pocock, D., (1978). Images of the Urban Environment, Columbia University Press, New York.
- 10. Turabian, K. (2007). A Manual for writers of Term papers, Thesis and dissertation (7th Edition), Univ. of Chicago Press, Chicago, U.S.A.
- 11. White, E., (1983). Site Analysis: Diagramming Information for Architectural Design, Architectural Media, USA.
- Yin, R., (1989). Case Study Research & Methods, Sage Publications, London. Zeisel, J., (1984). Inquiry by Design, Tools for Environmental Behaviour Research, Monterey, California.

4.7.7 Courses in Architecture [LAM Part I]

The BSc HBP (Architecture) degree is recognized and accredited by two professional bodies. The first one is from the Board of Architects Malaysia or Lembaga Arkitek Malaysia (LAM) equivalent to the Part I architectural qualification. The second is the international recognition from the Chartered Association of Building Engineers (CABE) from the United Kingdom (UK) which is a leading body for professionals specializing in the design, construction, evaluation and maintenance of buildings. Students graduating with BSc HBP (Architecture) have the good qualification necessary to be employed locally and abroad.

RAS 101 - Design Studio 1

This course exposes the students to the basic elements and principles used in designing works. Students are guided to come up with spatial designs based on basic design elements and principles learned from exercising projects either individual or in group works. Students are then to exhibit, and to explain their design works.

Learning Outcomes

At the end of the course students will be able to:

- (iv) Explain basic elements and principles of design
- (v) Exhibit design works by using the understanding of basic elements and principles of design
- (vi) Present the outcomes of comprehensive architectural design project individually or in group

- 1. Ching, F. D. K. (1990) Drawing, A Creative Process. New York: Van Nostrand Reinhold.
- Ching, F. D. K. (2007) Architecture: Form, Space & Order. 3rd Ed. New York: John Wiley & Sons, Inc.
- 3. Ching, F. D. K. (2009) Architectural Graphics. 5th Ed. New York: John Wiley & Sons, Inc.
- 4. Ching, F. D. K. (2010) Design Drawing 2nd Ed. New York: John Wiley & Sons, Inc.
- 5. Ching, F. D. K. & Eckler J.F. (2013) Introduction to Architecture. 3rd Ed. New York: John Wiley & Sons, Inc.
- 6. Ching, F. D. K. (2014) Building Construction Illustrated. 5th Ed. New York: John Wiley & Sons, Inc.
- Doyle, M. E. (1999). Color Drawing: Design Drawing Skills and Techniques for Architect, Landscape Architects and Interior Designers. 2nd Ed. New York: John Wiley & Sons, Inc.
- 8. Wahab, I. (1991). Perancangan Bandar: Aspek Fizikal dan Kawalan Pembangunan, Kuala Lumpur: Dewan Bahasa dan Pustaka.
- 9. Illingworth, J.R. (1993). Construction Methods and Planning. London: E & FN Spon
- 10. Kaspirin, R. (1999). Design Media: Techniques for Watercolor, Pen & Ink, Pastel and Colored Marker. New York: John Wiley & Sons, Inc.

- 11. Laseau, P. (2001). Graphic thinking for architects & designers 3rd ed. New York: John Wiley & Sons, Inc.
- 12. Lin, M. W. (1993). Drawing and Designing with Confidence: A Step-by-step Guide. New York: John Wiley & Sons, Inc.
- 13. Mills, C. (2000). Designing with Models: A Studio Guide to Making and Using Architectural Design Models. New York: John Wiley & Sons, Inc.
- 14. Uddin, M. S. (1997). Axonometric and Oblique Drawing: A 3D Construction, Rendering and Design Guide. New York: McGraw Hill

RAS 102 - Design Studio 2

The objective of the course is to train students to become an architect. The course emphasises the basic understanding of the processes involved in the development of architectural design and planning. The designs to be created must take into consideration all the needs of functionality, aesthetics, technology, eco-friendly, and sustainable; through the process of data collection, analysis of the site, and also its synthesis. The course will also emphasise the need to understand the fundamental aspects of space layout (both external and internal), forms, and also landscaping. Students will be exposed to the underlying implementation of a small-scale construction project. However, it is limited to only a one-storey (1) building. The students will also be guided to understand the critical processes of the formation of an idea, concept, design, material selection, choice of construction methods, and the application of technology to the design. Therefore, the course is designed in such a way to support students to be able to produce, showcase, and report on an architectural design created.

Learning Outcomes

At the end of the course students will be able to:

- (iv) Explain design concept based on elements and principles of architectural design
- (v) Exhibit appropriate small scale architecture design that shows the basic needs, function, hierarchy, aesthetic, technology and site analysis
- (vi) Elaborate the outcomes of comprehensive architectural design project individually or in group

- 1. Ching, F. D. K. (1990) Drawing, A Creative Process. New York: Van Nostrand Reinhold.
- Ching, F. D. K. (2007) Architecture: Form, Space & Order. 3rd Ed. New York: John Wiley & Sons, Inc.
- 3. Ching, F. D. K. (2009) Architectural Graphics. 5th Ed. New York: John Wiley & Sons, Inc.
- 4. Ching, F. D. K. (2010) Design Drawing 2nd Ed. New York: John Wiley & Sons, Inc.
- 5. Ching, F. D. K. & Eckler J.F. (2013) Introduction to Architecture. 3rd Ed. New York: John Wiley & Sons, Inc.
- 6. Ching, F. D. K. & Binggeli, C. (2012) Interior Design Illustrated. 3rd Ed. New York: John Wiley & Sons, Inc.

- Ching, F. D. K. (2014) Building Construction Illustrated. 5th Ed. New York: John Wiley & Sons, Inc.
- 8. Doyle, M. E. (1999). Color Drawing: Design Drawing Skills and Techniques for Architect, Landscape Architects and Interior Designers. 2nd Ed. New York: John Wiley & Sons, Inc.
- 9. Wahab, I. (1991). Perancangan Bandar: Aspek Fizikal dan Kawalan Pembangunan, Kuala Lumpur: Dewan Bahasa dan Pustaka.
- 10. Illingworth, J.R. (1993). Construction Methods and Planning. London: E & FN Spon
- 11. Kaspirin, R. (1999). Design Media: Techniques for Watercolor, Pen & Ink, Pastel and Colored Marker. New York: John Wiley & Sons, Inc.
- 12. Laseau, P. (2001). Graphic thinking for architects & designers 3rd ed. New York: John Wiley & Sons, Inc.
- 13. Lin, M. W. (1993). Drawing and Designing with Confidence: A Step-by-step Guide. New York: John Wiley & Sons, Inc.
- 14. Mills, C. (2000). Designing with Models: A Studio Guide to Making and Using Architectural Design Models. New York: John Wiley & Sons, Inc.
- 15. Uddin, M. S. (1997). Axonometric and Oblique Drawing: A 3D Construction, Rendering and Design Guide. New York: McGraw Hill

RAG 121 – Environmental Science 1

This course discusses on physical environmental issues and its measurement methods. It targets students to understand the physical environment in a holistic form, reviewing the condition and the quality of the national physical environment and the negative effect of unbalanced development. It also gives students the understanding of the interrelationship between environmental issues and climatic or ecological building design especially for the tropics. The students are also expected to understand the simple quantitative and qualitative evaluation methods on human comfort condition for the tropics. They are also expected to understand various aspect of natural or passive buildings' environmental or indoor climatic control such as natural ventilation, day lighting, shading design, heat flow, energy, noise control and acoustic.

Learning Outcomes

At the end of the course students will be able to:

- (i) Identify environmental issues of the country, current environmental problems including pollution issues and their relation with built environment
- (ii) Show skills in using basic measuring tools to measure climatic elements qualitatively or quantitatively in evaluating thermal comfort
- (iii) Study basic function and natural ventilation strategy, basic principles of natural lighting and its expectation, solar radiation control with shading design and principles of heat gain and heat loss in the building

References

1. Abdul Malek Abdul Rahman et al. (2009). *Towards A Low-Energy Building Design For Tropical Malaysia*. USM Press.

- 2. Ken Yeang, (2006). Ecodesign: A Manual for Ecological Design. Wiley- Academy.
- 3. Mat Santamouris (editor), (2006). Environmental Design of Urban Buildings: An Integrated Approach.
- 4. Christian S. (editor) (2003). *In Detail Solar Architecture*. Birkhauser Publisher for Architecture, Munchen.

RAG 132 – Introduction to Built Environment & Human Settlement

This course introduces the origins of human settlement on a various scales. The theory of the built environment and the regulations associated with it will be discussed.

Learning Outcomes

At the end of the course students will be able to:

- (i) Relate the elements in built environment with the history of human settlement.
- (ii) Understand and practice regulations associated with built environment.
- (iii) Respond in the way of group discussion about issues associated with human settlement.

References

- 1. Wendy R. Mcclure (Author), Tom J. Bartuska (Editor), (2007). *The Built Environment: a Collaborative Inquiry Into Design and Planning*, Hoboken : John Wiley & Sons.
- 2. N.J. Habraken and J. Teicher, (editors)(2000). *The Structure of the Ordinary: Form and Control in the Built Environment*. MIT Press.
- 3. J. Charles and J. Kibert, (1999). *Reshaping the Built Environment: Ecology, Ethics, and Economics.* Island Press.
- 4. N. Crowe, (1997). *Nature and the Idea of a Man-made World: An Investigation into the Evolutionary Roots of Form and Order in the Built Environment, MIT Press.*

RAG 161 – Building Construction 1

This course introduces basic comprehension pertaining to building and materials used in the building components, beginning with systems, basic structure and its building relationship. It covers the main component of substructure, superstructure and roof systems.

Learning Outcomes

At the end of the course students will be able to:

- (i) Identify construction materials which used in constructions.
- (ii) Organise types of materials suitable for constructions and sketch construction system in simple way.
- (iii) Propose materials and construction system which are suitable for building constructions.

- 1. Edward, A & Joseph I (2004). Fundamentals of Building Construction Material & Methods. 4th Edition, John Wiley & Sons, USA.
- 2. Seeley, I.H. (1995). *Building technology*. 5th Edition, Mac Millan.
- 3. Walton, D.W. (1987). *Building Construction: A Handbook for Diploma Students*. Mac Millan.
- 4. Francis DK Ching, (2008) *Building Construction Illustrated*, Van Norstrand-Reinhold.

RAS 203 – Architecture Studio 1

This studio course emphasizes on basic elements and principles used in building and environmental designs. Students are guided to come up with spatial designs based on design elements learned from exercising problem based projects, either individual or in groups. This course is a learning process of designing one to two storey buildings with an expression of architectural concept based on design and planning principles, physical structures, energy efficient technologies & services, internal & external circulations, and ecological & sustainable design. Students are also exposed to the right planning process and schematic design development in completing architectural studio projects using manual architectural graphic presentation.

Learning Outcomes

At the end of the course students will be able to:

- (i) Show understanding of design elements and principles in architectural design
- (ii) Explain the ecological and sustainable design based on basic understanding of building technology, structure and building services
- (iii) Show understanding of the design and planning process in producing schematic drawing for building up to 2 storeys with specific usage
- (iv) Suggest a site planning that is appropriate with site context based on individually or collaboratively done site analysis
- (v) Produce architectural drawings of building design and its spaces based on design concept and appropriate site planning

- 1. Laseau, P. (2001). *Graphic Thinking For Architects & Designers 3rd Edition*. New York: John Wiley & Sons, Inc.
- 2. Mills, C. (2000). Designing With Models: A Studio Guide To Making And Using Architectural Design Models. New York: John Wiley & Sons, Inc.
- 3. Ching, F.D.K. (1996). Architecture: Form, Space & Order.New York: John Wiley & Sons, Inc.
- 4. Lin, Mike W. (1993). Drawing And Designing With Confidence: A Step-By-Step Guide. New York: John Wiley & Sons, Inc.

RAS 204 – Architecture Studio 2

This course focuses on designing buildings up to three storey height with significant architectural concept based on design and planning principles that suit with building typology and site context. It also aims to strengthen students understanding on energy efficient and environmentally friendly building technology, structure and basic building services. The course also exposes the students to the design of public buildings with ecological and sustainable building approaches. Students are also required to exhibit and explain their design which is produced using computer aided architectural graphic presentation and other appropriate techniques.

Learning Outcomes

At the end of the course students will be able to:

- (i) Illustrate the understanding of design elements and principles in architectural design
- (ii) Justify the ecological and sustainable design based on basic understanding of building technology, structure and building services
- (iii) Show understanding of the design and planning process in producing schematic drawing for building up to 3 storeys with general and specific usage
- (iv) Suggest a site planning that is appropriate with site context based on individually or collaboratively done site analysis
- (v) Produce architectural drawings of building design and its spaces based on design concept, appropriate site planning and Universal Design

References

- 1. Laseau, P. (2001). *Graphic Thinking For Architects & Designers 3rd Edition*. New York: John Wiley & Sons, Inc.
- 2. Mills, C. (2000). Designing With Models: A Studio Guide To Making And Using Architectural Design Models. New York: John Wiley & Sons, Inc.
- 3. Ching, F.D.K. (1996). Architecture: Form, Space & Order.New York: John Wiley & Sons, Inc.
- 4. Lin, Mike W. (1993). Drawing And Designing With Confidence: A Step-By-Step Guide. New York: John Wiley & Sons, Inc.

RAK 232 - Principles of Architectural Design

The course encompasses the scope and definition of architecture language and vocabulary which includes elements of architecture design such as lines, shapes, color, texture, space, volume and scale. It also touches on architectural principles such as unity, contrast, proportion, harmony, balance, dominance and subordination, gradation; time and sequence. The course uses selected examples from historical and contemporary architecture to show relationship between form and function, technology, art, society and other elements and their effect on design. The course also covers case studies of important contemporary and past figures in architecture.

Learning Outcomes

At the end of the course students will be able to:

- (i) Define the architectural elements and principles.
- (ii) Interpret and sketch the product critically.
- (iii) Relate and report the architectural element and principles with the case studies.

- 1. Zulkifli Hanafi, (1985). Kompendium Sejarah Seni Bina Timur. USM
- 2. Zulkifli Hanafi, (1986). Prinsip-prinsip Rekaan Seni Bina. USM
- 3. Zulkifli Hanafi, (1988). Tokoh-tokoh Seni Bina Moden. USM
- 4. D.K.Ching, Francis, *Architecture, Form, Order & Space*, 2nd Edition, Van Nostrand Reinhold, 1993.
- 5. Faulkner, Waldron. Architecture and colour. New York: John Wiley-Interscience, 1972.

RAG 232 – Architectural Working Drawing and Documentation

This course exposes students to the role and status of drawings and other documents in the legal, contractual, administrative and technical context through the various project stages from pre-contract to post-contract. Students will be introduced to information structuring for working (submission/tender/contractual/production) drawings, schedules, detailing and specifications.

Learning Outcomes

At the end of the course students will be able to:

- (i) Identify the role and status of drawings and other documents in the legal, contractual, administrative and technical context through the various project stages from precontract to post-contract.
- (ii) Draw clearly and comprehensively using correct graphic symbology to convey accurate instructions on built form, sizing, technology, materials, construction suitable for statutory, contractual and building purposes.
- (iii) Select between different materials, finishes and technology to best reflect client or project requirements and aspirations. Write in a succint and concise manner, a specification document describing the quality of workmanship and material to be used with a set of project drawings.

- 1. Bowyer, Jack (1985). *Practical Specification Writing for Architects and Surveyors* 2nd ed., Hutchinson & Co., London.
- 2. Ayers, C (1975). Specifications: for Architecture, Engineeering and Construction USA.
- 3. Willis, A.J. (1971). *Specification Writing for Architects and Surveyors* 6th edition, GB.
- 4. Dunham, C.W. (1971). *Contracts, Specification and Law for Engineers* 2nd edition, McGrawHill, New York.
- 5. Goldsmith, G. (1948). Architect's Specifications AIA. Washington D.C., USA.

RAG 234 – Computer Aided Design for Architecture

This course gives exposure and training to students on how to produce two dimensional architectural drawings like plans, elevations, sections and detailings using the application of technology and computer aided software (AutoCAD).

Learning Outcomes

At the end of the course students will be able to:

- (i) Develope 2 dimensional architectural drawing skills using AutoCAD software.
- (ii) Produce drawings using the available commands in the AutoCAD software and having the ability to use all the commands to produce drawings.
- (iii) Discusse as a team and presenting the edited and printed drawings according to required scale and paper sizes.

References

- 1. Hassan, Ahmad Sanusi, (2011). *Two Dimensional AutoCAD Design Drawings* Five Star Publisher.
- 2. Thomas, Robert M. (1991). Encyclopedia AutoCAD Sybex Tech Asian Edition.
- 3. Omura, George. (2000). Mastering AutoCAD 2000 Premium. Edition. Sybex.
- 4. Snyder, James. (1998). Architectural Construction Drawings with AutoCAD. John Wiley and Sons.
- 5. ____, (2015). AutoCAD 2015. User's Manual. USA: Autodesk Inc.

RAG 265 – Building Construction 2

This course is a continuation of Building Construction 1 with emphasis on more complex building systems and advanced material. The scope covers construction systems from sub-structure such as pilings, retaining walls and basement constructions. It also elaborate on super structure of in-situ reinforced concrete, precast concrete as well as steel frames and their various component from columns, beams and floorings such as two-way, oneway, ribbed, waffle and precast slabs as well as composite floors. This course also outlines the wide span roof structures, construction and finishes. It also covers on stateof-the-art building envelope and finishes such as curtain walling and different types of claddings.

Learning Outcomes

At the end of the course students will be able to:

- (i) Elaborate on types of materials, components and details of construction system.
- (ii) Illustrate and explain critically, the systems according to appropriate use for construction and detailings.
- (iii) Collect and analyse case study data through observation and interviews as well as report and present information in a critical manner.

References

 Edward, A & Joseph I (2004). Fundamentals of Building Construction Material & Methods,4th Edition, John Wiley & Sons, USA.

- 2. Warszawski, A (1999). Industrialised and Automated Building System, A Managerial Approch, E & FN Spon, London.
- 3. Everett, A. (1994). *Materials*, 5th Edition, Fed. Res. Bank of Boston.
- 4. Illingworth, JR (1993). Construction Methods and Planning, E & FN Spon, London
- 5. Uniform Building By-Laws 1985, Laws of Malaysia.

RAS 305 – Architecture Studio 3

The course guides the students to acquire a solid understanding of the design process involving medium storey buildings located in rural or natural environment. Exposure focuses on a sustainable and ecological approach to the planning and design of the site and building architecture. Guidance is given to integrate environmental friendly structure, building services, technology, materials and construction.

Learning Outcomes

At the end of the course students will be able to:

- (i) Explain through graphics the elements and principles of architectural design with sustainable and ecological concept.
- (ii) Give response through presentation on existing site planning and building design based on analysis of form, space, aesthetic, technology, structure, building services, material and construction
- (iii) Reproduce individually and collaboratively, the site planning and design, form and space by using the design elements and principles based on the sustainable and ecological concept.
- (iv) Sketch the architectural building form and spaces with integration of structure, building services, technology, material and construction based on the sustainable and ecological concept.

References

- 1. Kilbert, C.J.(2005). *Sustainable Construction: Green Building Design and Delivery*. New Jersey: John Wiley & Sons, Inc.
- 2. McHarg, I.(1992). Design with Nature. New York: John Wiley & Sons Inc.
- 3. Pearson, D.(2001). *New Organic Architecture: The Breaking Wave*. London: Gaia Books Limited.
- 4. Halliday, S.(2007). Sustainable Construction. Oxford: Butterworh-Heinemann.
- 5. Yeang, K.(2007) . *Eco Skyscrapers*. Australia: The Images Publishing Group Pty Ltd.

RAS 306 – Architecture Studio 4

Students are guided to acquire a sound understanding of the processes, elements and principles involved in the urban design context. Freedom are given to handle projects involving a comprehensive planning and design of a building which focuses on the integration of structure, building services, technology, materials and construction in an urban area. Students will be exposed to elements and principles or urban design with urban infill characteristics.

Learning Outcomes

At the end of the course students will be able to:

- (i) Sketch the elements and principles of design and urban planning
- (ii) Give response through presentation on existing site planning and urban design based on analysis of form, space, aesthetic, historical aspects and heritage building.
- (iii) Reproduce individually and collaboratively, the site planning and design, form and space by using the urban design elements and principles for midrise building that comply with local council guidelines and Uniform Buildin By Law (UBBL)
- (iv) Sketch the architectural building form and spaces with the integration of sustainable structure, building services, technology, material and construction that suit with local climate and culture

References

- 1. Lagro Jr., James A & Lin, Mike W.(1999). *Site Analysis Drawing & Designing with Confidence*. Asia.
- 2. Antoniades, Anthony,(1992). *Poetic of Architecture: Theory of Design*. Van Nostrand Reinhold.
- 3. Lynch, Kelvin, (1961). The Image of The City. MIT Press.

RAG 322 - Environmental Science 2

This course starts by understanding the building physical environment specifically, starting with building ventilation, decay and deterioration, heat control and light, building maintenance and energy saving. Its understanding is reinforced through evaluating the quality of building environmental control passively and actively, and method of integrating the whole building system. It is then related to the understanding of the design needs based on climate through innovative design solutions which have successfully being developed and adopted in the current building design.

Learning Outcomes

At the end of the course students will be able to:

- (i) Use environmental measuring instruments and analyse the data that have been collected
- (ii) Relate the theory of basic environmental science with the reality of environmental problem facing by the building
- (iii) Explain the causes of environmental problem occurred in the building and suggest the way to solve it
- (iv) Analyse and summarize the outcomes of the study and present it critically

- 1. Abdul Malek Abdul Rahman et al. (2009). *Towards A Low-Energy Building Design For Tropical Malaysia*. USM Publisher.
- 2. KenYeang (2006). Ecodesign: A Manual For Ecological Design. Wiley Academy.

- 3. Mat Santamouris (editor) (2006). Environmental Design of Urban Buildings: An Integrated Approach.
- 4. Christian S. (editor) (2003). *In Detail Solar Architecture*. Birkhauser Publisher for Architecture, Munchen.

RAG 333 – Advanced Computer Aided Architecture Design

This course is to develop skills and creativity in documenting 3 dimension working drawing, report and animation clip in architecture and interior design using special software

Learning Outcomes

At the end of the course students will be able to:

- (i) Produce drawings of building elements in 2 dimension, 3 dimension and animation using appropriate menus of computer software.
- (ii) Creatively suggest and produce 3D building plan through animation presentation aided by computer software

References

- 1. Hassan, Ahmad Sanusi.(2010) Module Teaching: Architectural Movie Animation, Unpublished Handbook (digital). Universiti Sains Malaysia.
- 2. _____, (2015).3D Studio Max 15: User's Manual. USA: Autodesk Inc.
- 3. _____, (2015).AutoCAD 2015: User's Manual. USA: Autodesk Inc.
- 4. Hassan, Ahmad Sanusi. (2002). *Lukisan Dua Dimensi AutoCAD*. Penang: Five Star Publisher.
- 5. _____, (2010). Audiograbber: User's Manual. USA: Audiograbber Inc.
- 6. ____, (2015). Window Movie Maker, USA: Microsoft Inc.

RAK 344 – History and Theory of Architecture 1

This course covers design history and theory in architecture from Early Middle East to Renaissance civilisation (before modern period) using 'timeline context of architectural chronology' which contains architecture of Pagan, Christianity, Islam, Hindu, Buddha, Taoism and Shinto religion in Middle East, Europe, Africa, India, South East Asia and East Asia.

Learning Outcomes

At the end of the course students will be able to:

- (i) Summarize architectural styles based on 'timeline context of architectural chronology' starting from early civilization in Middle East, Europe, Islam, India, China until Renaissance
- (ii) Present the fact and explanation of history and theory based on systematic methodology regarding architectural styles and design.

References

1. Ching, F.D.K., Jarzombek M. & Prakash V. (2011). A Global History of

Architecture. 2nd edition. New Jersey: John Wiley and Sons Inc.

- 2. Fletcher, Banister. (1999). A History of Architecture. 20th edition. Edited by Cruickshank, Dan. New Delhi: CBS Publishers & Distributors.
- 3. Trachtenberg, M. & Hyman, I., (1986), Architecture: From Prehistory to Post-Modernism/The Western Tradition. New York: Harry N. Abrams Inc.
- 4. Kostof, Spiro. (1995). *A History of Architecture*. 2nd edition. Oxford: Oxford University Press.
- 5. Abdul Ghani, Muhammad Ilyas. (2003). *Sejarah Mekah (History of Makkah)*. translated by Mesyhadi, Anang Rikza, Jakarta: Menteri Agama Republik Indonesia.
- Al-Ahmadi, Abdul Rahman. (1990). "Bangunan Kuno Masjid Kampung Laut: Hubungannya dengan Campa dan Demak" (Old Building Kampung Laut Mosque: Its relation to Champa and Demak". Warisan Kelantan IX (Kelantan Heritage IX). Edited by N.M. Nik Mohd. Salleh. Kota Bharu: Kelantan State Museum Corporation.
- 7. Boyd, A. (1962). Chinese Architecture and Town Planning. London.
- 8. Govinda, Lama Anagarika. (1976). *Psycho-cosmic Symbolism of the Buddhist Stupa*. Emeryville: Dharma Press.
- 9. Dawson, Barry & Gillow, John. (1994). *The Traditional Architecture of Indonesia*. London: Thames and Hudson Ltd.
- 10. Knapp, Ronald G. (1989). China's Vernacular Architecture: House Form and Culture. Honolulu: University of Hawaii Press.
- 11. Kuban, Dogan. (1974). *Muslim Religious Architecture: Part 1 The Mosque and Its Early Development*. Edited by P.V. Baaren, L. Leertouwer, F. Leemhuis & H. Buning. Leiden: E.J. Brill.
- 12. Leacroft, Helen & Richard. (1976). *The Buildings of Early Islam*. London: Hodder & Stoughton.
- 13. ____, Tillotson, G.H.R. (ed.) (1998). *Paradigms of Indian Architecture*. Surrey: Curzon Press.

RAK 345 – Housing Studies

This course discusses housing concepts, policies and human settlements. It explains the relationship between urbanization and housing, including the housing qualities and needs. The course also gives an overview on housing resources such as land, finance and technological aspects. It exposes the students to the housing strategies and alternative approaches, including project planning with feasibility studies and site analysis, as well as its social and physical aspects. In addition, it also touches on the several issues of housing such as the implementation of the government's housing transformation plans like OSC, CCC, housing sustainability, house typology and other various concepts of housing, and also explains the rationales of the enforcement of relevant acts and laws involved in the housing imdustry.

Learning Outcomes

At the end of the course students will be able to:

- (i) Identify housing concepts and connect them with physical conditions of existing housing development.
- (ii) Explain the causes and effects of policy and regulations implementation in an effort

to improving housing delivery and supply to the public

(iii) Propose solutions to the existing housing issues that have been identified from the field study conducted in group

References

- 1. French, Hilary, (2006). *New Urban Housing*. Laurence King Publishing Ltd, United Kingdom.
- 2. Goodchild, Barry, (1997). *Housing and Urban Environment: A Guide to Housing Design, Renewal, and Urban Planning.* Blackwell Science Ltd, London.
- 3. Colquhoun, I. and Fauset, P.G. (1991).*Housing Design in Practice*. Longman Scientific and Technical, Harlow, Essex.
- 4. Day, C. (1993). *Places of the Soul*. The Aquarian Press, London.
- 5. Howard, E. (1985). Garden Cities of Tomorrow. Attic, Eastbourne.
- 6. An Introduction to Housing Layout: A GLC Study. The Architectural Press, London (1978).
- 7. Habraken, N.J. (1971). *Supports: An Alternative to Mass Housing*. The Architectural Press, London.
- 8. David Drakakis Smith, (1981). *Perbandaran Perumahan dan Proses Pembangunan* (Terjemahan: Alip Rahim dan Rahmat Azam Mustafa), USM, P.Pinang.
- 9. Abdul Hakim Mohamed, (1990). *Perancangan Projek Binaan*. Dewan Bahasa dan Pustaka, Kuala Lumpur
- 10. Nabeel Hamidi, (1991). *Housing Without Houses*. Van Nostrand Rteinhold Publication
- 11. Ghani Salleh and Meng, LL. (1997). Low Cost Housing in Malaysia. Utusan Publication

RAK 346 – History and Theory Of Architecture 2

This course covers history and theory in architecture from pre-colonial time to the present day discussing on the Malay, colonial and modern architecture and their influences to developments of architectural design in Malaysia. This understanding is important which provides conceptual description linked with theory to the design of contemporary architecture rooted from architectural development through history in Malaysia.

Learning Outcomes

At the end of the course students will be able to:

- (i) Critically correlate history and theory of architecture styles based on'timeline context of architectural chronology' of Malaysia
- (ii) Differentiate Malaysia architectural theories by reproducing sketches and explanation of history based on systematic methodology from the relevant sources regarding architectural styles

- 1. Ching, F.D.K., Jarzombek M. & Prakash V. (2011). A *Global History of Architecture*. 2nd edition. New Jersey: John Wiley and Sons Inc.
- 2. Fletcher, Banister, (1999). A History of Architecture. 20th edition. Edited by Cruickshank, Dan. New Delhi: CBS Publishers & Distributors.

- 3. Trachtenberg, M. dan Hyman, I., (1986). Architecture: From Prehistory to Post-Modernism/The Western Tradition, New York: Harry N. Abrams Inc.
- 4. Kostof, Spiro. (1995). *A History of Architecture*. 2nd edition. Oxford: Oxford University Press.
- 5. Elmagalta, Aymen Mohamed, Hassan, Ahmad Sanusi & Ku Hassan, Ku Azhar, (2010), *Resort Architecture in Langkawi, Malaysia*, Penang: USM Press.
- 6. Hassan, Ahmad Sanusi, (2001). *Issues in Sustainable Development of Architecture in Malaysia*, Penang: USM Press
- 7. Hassan, Ahmad Sanusi, (2012). *Heritage Buildings in George Town, Malaysia,* Penang: USM Press.
- 8. Cagamas Berhad (1997). Housing the Nation. Cagamas Bhd, Kuala Lumpur
- 9. 1st to 9th Malaysian Plan, Government of Malaysia.
- 10. Edward, B. (2000). *Sustainable Housing Principles and Practice*. London: E & FN Spon.
- 11. UBBL and relevant laws of Malaysia.

RAL 371 - Measured Drawing

This course is about preparing a documentation or record of a particular building in the form of scaled drawings and special reports. The drawings are to include the building location, site, floors, elevations, sections, 3-D drawings and detailing of special features of the building. The report is a compilation of the building's historical background, ownership and design development involved. Aspects of design concept, spatial function, technique of construction, building orientation and decoration will be investigated and reported. Techniques of building measurement include the application of theodolites, measuring tapes, photography and sketches on site.

Learning Outcomes

At the end of the course students will be able to:

- (i) Prepare a scaled measured drawing of selected heritage building.
- (ii) Relate the design of the above building with its background history and beginning.
- (iii) Present a product of work in the form of scaled drawing and comprehensive report of the selescted building.

- 1. Lim, J.Y. (1987). *The Malay House: Rediscovering Malaysia's Indigenous Shelter System.* Penang, Institut Masyarakat.
- 2. Fletcher, Banister. (1999). *A History of Architecture*. 20th edition. Edited by Cruickshank, Dan. New Delhi: CBS Publishers & Distributors.
- 3. Nasir, A.H. (1987). Traditional Malay Wood Carving. Kuala Lumpur, DBP.
- 4. Hanafi, Z. (1999). Siri Lukisan Rumah Melayu Di Pulau Pinang, Kulim. Amber Solara Pub.
- Koenig, P.A. (2006). Design Graphic; Drawing Technique for Design Professionals. 2nd Edition, Pearson Prentice Hall

4.7.8 Courses in Building Surveying

RBS 203 – Building Surveying Studio 1

This course exposes the students to building design process, the technical elements in the design of the building, the maintenance element at the beginning of the design process and legislation aspects that involved in the project in order to obtain plan approval.

Learning Outcomes

At the end of the course students will be able to:

- (i) Understand the process of building design.
- (ii) Identify the technical elements in the design of building
- (iii) Determine the maintenance components at the beginning of the design process
- (iv) Report and review the legislation aspects that are involved in the project in order to obtain plan approval

References

- 1. Huybers, P. (2002), The Morphology of Building Structures. Springer.
- 2. Zainul Abidin, N., (2010) *Environmental Concern in Malaysia Construction Industry*. Penerbit USM.
- 3. Ibrahim Wahab (1991) *Perancangan Bandar: Aspek Fizikal dan Kawalan Pembangunan*, Kuala Lumpur: Dewan Bahasa dan Pustaka
- 4. Abdul Aziz Hussin (2004). Aspek Undang-Undang dalam Pengurusan Projek Pembinaan. Pulau Pinang: Penerbit USM
- 5. Abdul Aziz Hussin (2004). *Pembangunan Harta Tanah: Perundangan dan Prosedur Pengurusan*. Pulau Pinang: Penerbit USM
- 6. Palmer, D. (2006), *Maintenance Planning and Scheduling Handbook*, New York: McGraw-Hill
- 7. Kelly, A. (2006), *Strategic Maintenance Planning*, Oxford: Butterworth-Heinemann.
- 8. CIDB (2000). Modular Design Guide. CIDB Malaysia
- 9. Christian Meyer (1995). The Design of Building Structures. Prentice Hall.
- 10. Clive Briffett (1995). *Building Maintenance Technology in Tropical Climates*. Singapore University Press
- 11. Lee How Son & George C.S. Yuen (1993). *Building Maintenance Technology*. The Macmillan Press Ltd

RBS 204 – Building Surveying Studio 2

This particular course emphasizes on hands on projects associated to the conservation and preservation of old buildings, the processes that are involved in conservation and preservation and the impact of alterations to the condition of the building.

Learning Outcome

At the end of the course students will be able to:

- (i) Comprehend the process involved in building conservation
- (ii) Apply building conservation practice involving repair and renovation works of heritage buildings
- (iii) Determine the impact of renovation works on the condition of the building and the relevant legislation
- (iv) Practice professional communication skills and group interaction

References

- 1. Peter Glover (2006). Building Surveys, 6th Edition, Butterworth-Heinemann
- Edward A. Noy, James Douglas. (2005). *Building Surveys and Reports* Blackwell Publishing
- 3. Building Surveying Faculty (2003). Dilapidations. RICS Books
- 4. David Chappell. (1996). *Report Writing For Architects and Project Managers*. 3rd Edition. Blackwell Science
- 5. Watt D, Swallow P. (1996). *Surveying Historic Buildings*. Don head Publishing Limited.
- 6. Lembaga Penyelidikan Undang-Undang (Hingga Jun 2007). Undang-Undang Kecil Bangunan Seragam 1984 [P.W. 5178/85]. ILBS
- 7. State Gov't of Penang (Feb 2008). Heritage Management Plan: Historic City of George Town
- 8. Majlis Perbandaran Pulau Pinang (2008) *Dasar-Dasar dan Garispanduan, Pulau Pinang*: MPPP
- 9. Goodhew, S. (2016) *Sustainable Construction Process*: A Resource Text, Wiley Blackwell

RBK 231 – Principle of Building Surveying

This course outlines the general principles and responsibility of the professionalism in building surveying field. The main scope of work and responsibilities focuses on the building condition assessment according to current standard of practice which is implemented in the industry and also building maintenance management practices.

Learning Outcome

At the end of the course students will be able to:

- (i) Identify the real needs of the field survey of buildings by certain categories.
- (ii) Comply with requirements to ensure the quality of construction through the analysis of the facts and the latest information.
- (iii) identify the real needs of the field survey of buildings by certain categories
- (iv) Follow the standards and understand the implications of building the data
- (v) Understand the process of building condition assessment precisely
- (vi) Explain the important of building maintenance holistically

- 1. Glover, Peter. (2006). *Building Surveys*. 6th Edition. Butterworth-Heinemann Oxford: Reed Elsevier
- 2. Edward A. Noy & Douglas (2005). *Building Surveys and Reports*. 3rd Edition. J. Blackwell Publishing.
- 3. Westwood, Fiona. (2001). Achieving Best Practice: Shaping Professionals for Success. McGraw Hill
- 4. Chappel D. (1996). *Report writing for Architects and Project Managers*. 3rd Edition. Blackwell Science.
- 5. Peter Harlow (1984). *Managing Building Maintenance*. The Chartered Institute of Building
- 6. Kelly, A. (2006), *Strategic Maintenance Planning*, Oxford: Butterworth-Heinemann.
- 7. Lee, R., (1987), *Building Maintenance Management*, Oxford: BSP Professional Books.

RBS 305 – Building Surveying Studio 3

This course focuses on hands on projects of building audit and audit system related to the field of Building Surveying. It involves space audit, building security audit, building condition survey and building services assessment.

Learning Outcomes

At the end of the course students will be able to:

- (i) Identify the types and importance of building audit related to the field of Building Surveying
- (ii) Carry out building audit tasks according to standard of practice
- (iii) Produce building audit report according to standard format
- (iv) Present issues clearly and confidently.
- (v) Organise a team effectively and understand the role between leader and team members.

- Building Surveying Faculty (2005). Stock Condition Surveys. 2nd edition. RICS Books.
- 2. Malcolm Hollis (2005). Surveying Buildings. 5th Edition. RICS Books.
- 3. Building Surveying Faculty (2003) Dilapidations RICS Books.
- 4. Jennings, A (1995). Accounting and Finance for Building and Surveying Palgrave Macmillan.
- 5. Lembaga Penyelidikan Undang-Undang (Hingga Jun 2007). Undang-Undang Kecil Bangunan Seragam 1984 [P.W. 5178/85]. ILBS.
- 6. Abdul Hakim Mohamad & Wan Min Wan Mat. (1991), *Teknologi Penyenggaraan Bangunan, Kuala Lumpur*:DBP.
- 7. Kelly, A. (2006), Strategic Maintenance Planning, Oxford: Butterworth-Heinemann.

RBS 306 – Building Surveying Studio 4

This course exposes the students to hands on projects related to facilities and asset management practices, procurement studies related to facilities and asset management, Private Financial Initiative (PFI) and mechanism of the organization towards promoting entrepreneurship.

Learning Outcome

At the end of the course students will be able to:

- (i) Understand the main components of facilities management, asset manamenet and maintenance of buildings.
- (ii) Apply the culture of facilities and asset management which is entrepreneurship oriented.
- (iii) Execute total asset and facilities maintenance management of organization
- (iv) Display leadership skills in multidisciplinary setting

References

- 1. P. Wordsworth (2001) *Lee's building maintenance management*: 4th Edition, Oxford: Blackwell Science Ltd
- 2. Nutt, B. and McLennan, P. (2000) *Facility Management Risks and Opportunities*, Oxford: Blackwell Science Ltd
- 3. B. Atkin, A. Brooks (2000) *Total Facilities Management*, Blackwell Science, London
- 4. K. Alexander (1996) *Facilities Management Theory and Practice*, Taylor & Francis, Basingstoke
- 5. Baird G., Gray, J., Isaacs, N., Kernoghan, D. & McIndoe, G. (1996) *Building Evaluation Techniques*, New York: McGraw-Hill.
- 6. Alexander, K. (1999) Facilities management, London, E&FN Spon.
- 7. Barret, P. (1995) *Facilities Management: Towards Best Practice*, Oxford, Blackwell Science Ltd.
- 8. Becker, F. (1990) The Total Workplace, New York, NY, Van Nostrand Reinhold.
- 9. Sullivan, F. (2007) Malaysia Opening to Third-Party Integrated Facilities Management Services
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RBK 351 – Professional Practice for Building Surveyor

This course is designed to expose students on topics related to professional practice, ethical standards, obligations and professional services offered by Building Surveyor. In addition to that, students will also be exposed to commercial management of construction law, contract and liability & organizations of parties that involves in construction industry. At the end of the course, students should be able to consider professional codes and ethics of building surveying profession and interpretation of contracts, liability and obligation related to building surveying and others professions.

Learning Outcomes

At the end of the course students will be able to:

- (i) Explain the legal and professional practice related to Building Surveying in Malaysia.
- (ii) Integrate responsibility, value and ethics with building surveying professional practice.
- (iii) Consider professional codes and ethics of building surveying profession
- (iv) Adjudicate the issues of disputes and the ability to make a decision agreed by all parties.
- (v) Interpretation of contracts, liability and obligation related to building surveying and others professions.
- (vi) Display the ability to adapt to changes in the industry and technology advancement and be innovative in the dynamic environment

References

- Edward A. Noy (Revised by James Douglas). (2005). Building Surveys and Reports, 3rd Edition. Blackwell Publishing.
- 2. Murdoch, John (2002). Negligence in Valuation and Surveys. London: RICS Books.
- 3. Westwood, Fiona.(2001). Achieving Best Practice: Shaping Professionals for Success. McGraw Hill Publishing Company.
- 4. ISM Building Surveyor Section (1995). *Akta (Deraf)Juruukur Bangunan*. Institution of Surveyors Malaysia.

RBG 351 - Building Maintenance

This course focuses on Maintenance Management and Technology. Students are exposed to variety types of building maintenance; planned and un-planned maintenance methods, maintenance policy, impact of design on maintainability, prioritizing and costing the maintenance works, budgeting and funding the maintenance works and maintenance procurement. It is also emphasis on building maintenance management technology for commercial building. Students are also exposed to preparation of maintenance plan and specification writing for maintenance works and finally on sustainable building performance aspect in order to provide a comfortable and productive environment to building users.

Learning Outcomes

At the end of the course students will be able to:

- (i) Interpret the concept of maintenance of the building in a systematic manner and recognize the needs and requirements of building maintenance and operation
- (ii) Diversification techniques and new technologies on maintenance and differentiate the techniques of building maintenance for old and new buildings;
- (iii) Develop and establish maintenance plan and specification writings for maintenance works in a professional manner
References

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- 2. Ivor H. Seeley. (1977) Building Maintenance. Macmillan Press Ltd
- 3. Lee How Son & George C.S. Yuen (1993). *Building Maintenance Technology*. The Macmillan Press Ltd
- 4. Derek Miles & Paul Syagga (1987). *Building Maintenance A management manual*. Intermediate Technology Publication
- 5. Peter Harlow (1984). *Managing Building Maintenance*. The Chartered Institute of Building
- 6. Abdul Hakim Mohamad & Wan Min Wan Mat. (1991), *Teknologi Penyenggaraan Bangunan, Kuala Lumpur*:DBP.
- 7. Palmer, D. (2006), *Maintenance Planning and Scheduling Handbook*, New York: McGraw-Hill
- 8. Lee, R., (1987), *Building Maintenance Management*, Oxford: BSP Professional Books.

RBL 371 – Building Surveying Studies

This course focuses on the academic study in Building Surveying. Research method includes various aspects of built environment which emphasize on preparation of report and oral presentation of research output.

Learning Outcomes

At the end of the course students will be able to:

- (i) Formulate problems associated to buildings, local issues and proven solutions in details.
- (ii) Building a research model in line with the objectives of the study alone or in groups.
- (iii) Propose and present the research findings relevant to the needs of design, construction and safety features of buildings.

References

- 1. Salkind, N.J. (2003) Exploring Research, Person Education Inc. New Jersey, USA.
- 2. Straus, A (1998). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*, SAGE Publication Inc. California, USA
- 3. Sharp, J.A. and Howard, K. (2002) The Management of a Student Research Project, 3rd Edition, Gower Publishing Ltd. Hants, England.
- 4. Tan, W. (2001) *Practical Research Methods*, Practice Hall, Singapore.
- 5. Salkind, N.J. (2016) *Exploring Research*, 9th Edition, Person Education Inc., New Jersey, USA.
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- Sekaran, U. & Bougie, R. (2016) Research Methods for Business: A Skill Building Approach, 7th Edition, John Wiley & Sons, Inc., New York.

5.0 GENERAL INFORMATION OF PROGRAMMES/SCHOOL

5.1 Career Prospects

Graduates from the School of HBP are well accepted by the construction industry. Many have become professional, senior managers and executives in consulting firms, construction organisations, property development companies and government agencies. The broad-based approach combined with specialization gives our graduates the competitive edge in striving in the construction and development industry in professional, civil and ethical manner

5.2 Alumni

The Alumni Association of the School of HBP was officially established in August 1999. The aim of the Alumni is to inculcate cohesive interaction and relationship encompassing professional, scientific, social and cultural levels that can provide and develop networking of inter-disciplinary communication as well as to provide a sounding board between the ex-students of the School of HBP.

Membership of this association is opened to all ex-students and staff of HBP and its representatives comprise of 8 committee members that is headed by the President. Its registered address is at School of Housing, Building and Planning, Universiti Sains Malaysia, 11800 USM, Penang.

5.3 Conferment and Awards

Conferments and Awards are divided into three levels, i.e. at School level, University level and Professional Bodies level.

5.3.1 School Level

The Dean's List Award will be conferred to students who have obtained a CGPA of 3.5 in their academic endeavor for every semester.

5.3.2 University Level

At the university level, awards will be given to final year students who are excellence in their overall fields of study such as the Chancellor's Gold Medal, Royal Student Award and University Gold Medal by the University Women Association.

5.3.3 Professional Bodies Level

Excellence students also have the opportunity to be conferred with awards from profesional bodies.

5.4 School Association

HBP students are allowed to conduct various academic or non-academic activities with the establishment of the School of HBP's Association. All students of HBP are members and this association is a moderating medium between the management and the student levels.

The students' activities include conducting orientation week, study tours, organizing the school dinner and arranging students' activities with other universities and institutions locally or internationally.

5.5 Graduate Studies

The School offers graduate studies degree programmes such as Masters and Doctor of Philosophy (PhD) programmes. Masters programmes are conducted by coursework and research modes while the PhD programme is by research only. The fields of studies are as follow:

- Project Management
- Planning
- Building Technology
- Building Survey
- Housing
- Architecture
- Landscape Architecture
- Quantity Surveying

5.6 Overseas Learning Scheme

USM also offers an overseas learning scheme to first and second year students who are interested in continuing their first semester at an international university. These schemes are aimed at exposing students with new experiences at international level as well as to allow transfer of their academic credits. For further information and enquiries, contact: International Relations, Students Affairs and Academic Department, USM.

5.7 School Website

Information about the School of Housing, Building and Planning can be obtained from the school website at: <u>http://www.hbp.usm.my</u>

5.8 Facilities

5.8.1 Physical Facilities

Facilities include provisions of studio space for the students.

5.8.2 Resourse Centre/Branch Library

The School of HBP has its own Resource Centre to cater for the needs of the students. Materials found in the Resource Centre includes the following:

- i. Academic books
- ii. Seminar papers
- iii. Magazines
- iv. Research Projects
- v. Dissertation
- vi. Samples of building materials, etc.

5.8.3 Laboratories

The School also has several laboratories for the purpose of conducting practical classes. All the instruments found in the laboratories are related to the construction industry in the country. The laboratories are:

- i. General Workshop
- ii. Structure Laboratory
- iii. Soils Laboratory Concrete and Cement Technology Laboratory
- iv. Environmental Physics Laboratory
- v. Information Technology Laboratory (IT Lab)
- vi. Photography and Audio Visual Laboratory

a. General Workshop

Services offered:

- i. Arc Welding
- ii. Gas Welding

b. Structure Laboratory

Torsee Universal Testing Machine 50T Torsee Universal Wood Testing Machine 10T

Educational Facilities:

- i. Friction on Incline Plane Apparatus
- ii. Torsion Bar Apparatus
- iii. Continuous Beam Apparatus
- iv. Roof Truss Apparatus
- v. Portal Frame Apparatus
- vi. Shear Force and Bending Moment Apparatus
- vii. Reaction of Beam Apparatus
- viii. Etc.

c. Soil Laboratory Concrete and Cement Technology Laboratory

- i. Fan Ventilated Oven
- ii. Sand Replacement Apparatus

- iii. CBR Testing Machine (Laboratory and In-Situ)
- iv. Mechanical Compactor
- v. Linear Shrinkage Apparatus
- vi. Field Vane Apparatus
- vii. Penetrometer
- viii. Vibrating Hammer
- ix. Electronic Balance
- x. Casagrande Liquid Limit Apparatus

d. Environmental Physics Laboratory

Environmental Physics Laboratory conducts various tests related to the environmental science.

- Anemometer, digital
- Anemometer, hot-wire
- Thermometer Infrared
- Electronic Thermo-hygrograph
- Sunshine Recorder
- Data Logger

e. Information Technology Laboratory (IT Lab)

The IT Lab is equiped with 100 computers for use in various computer courses such as Auto Cad, GIS, ATS/Front Page. Among the facilities provided include:

- FTP 'drop boxes' for submission of assignments.
- Provision for Web site design, 3-D Modelling and Animation
- Internet access
- E-Learning Platform
- E-mail access
- Other common computer use.
- Auto Cad

f. Photography and Audio Visual Laboratory

This laboratory provides the following services:

- Single Lens Reflex (SLR)
- Audio Focus Cameras
- Epidiascope
- Overhead Projectors
- Slide Projectors
- LCD Computer Projector

5.9 Industry Advisory Panel (IAP)

i. Architecture

Ar. Hamdan Abdul Jamal Pertubuhan Arkitek Malaysia 4 & 6 Jalan Tangsi 50480 Kuala Lumpur

ii. Building Technology

Y.Bhg. Dato' Abd Ghani Yusof Metronic Engineering Sdn. Bhd. Executive Vice Chairman No. 2, Jalan Astaka U8/83 Seksyen U8, Bukit Jelutong 40150 Shah Alam, Selangor Darul Ehsan

iii. Interior Design

Mr. Dickie Ong Chye Huat Axial Interior Design A-2-2 Kestana Apartment Jalan 2/62D Bandar Manjalara 52200 Kuala Lumpur

iv. Construction Management

Dato' Hj. Mohamed Fadzil Hassan Managing Director Fadzil Construction Sdn. Bhd. no. 69D-2, Persiaran Bayan Indah, Sg. Nibong, Bayan Lepas, 11900 Pulau Pinang

v. Quantity Surveying

Y. Bhg. Dato' Sri Kandan Kanagainthiram
KPK Quantity Surveyors (Semenanjung) Sdn. Bhd.
18-6 & 18-7, 18th Floor. Megan Avenue II
12, Jalan Yap Kwan Seng
50450 Kuala Lumpur

Sr Saw Soon Kooi Kuantibina Sdn. Bhd. Suite No. 2. 1, 2nd Floor Burmah House 405, Jalan Burma 10350 Pulau Pinang Sr Chua Siow Leng 179-11 Sri Wangsaria Condominium Jalan Ara, bangsar baru 59100 Kuala Lumpur

vi. Urban and Regional Planning

Puan Norliza Hashim Presiden(Mantan) Pertubuhan Perancang Malaysia B-1-02, Jalan SS 7/13B, Aman Seri, Kelana Jaya, 47301 Petaling Jaya, Selangor, Darul Ehsan

5.10 Administrative /Technical/Laboratories Staff

Senior Assistant Registrar Assistant Registrar Research Officer Executive Secretary (Stenographer to Dean) Senior Secretary (Stenographer to Deputy Dean) Senior Administrative Assistant	 Abd Manaf Muhamad Yunus Iftitah Abdul Razak Khalid Ahmad Alyeza Ab Aziz Juliana Abdul Mutalib Nur Ervinna Ariffin
Administrative Assistants (Clerical)	 Fauziah Hanim Mohd Ismail Noraini Abu Hassan Normah Ismail Khalilah Salha Muhamad Hassan Siti Aishah Bedin Ainul Azrul Abd. Latif Ashahril Idrus Malissa Nadia Mohd Rodzi Norwahida Ismail
Senior Assistant Engineer	: Abdul Jalil Ishak : Rozyta Lokman
Senior Asst. Architecture Officer Senior Lab Assistants Lab Assistants	 Zainal Abidin Md. Saad Mohd Adnan Omar Feyrus Samat Mohd. Faisal Md. Nasir Mohamad Fikrillah Mohd Ridwar Nurul Huda Zakaria
Senior Technician	: Aishah Abu Bakar Faridahton Mohamad Salleh Md. Noh Sohaimi Zulyadain Hassan
Technicians	: Diana Isme Ishak Mohd Suhaimi Samsudin Firdaus Mohd Ibrahim
Computer Technician Senior Draught Person Administrative Assistant (Clerical) (Resource Centre)	: Rizwadi Md Noor : Azliza Ahmad : Azliza Ahmad
Senior General Assistant	: Mohd. Poudzi Mohd. Noor Zamri Awang
General Assistants	: Mohamed Yusoff Mohd Khairi Khairuddin Idris Shaari