ACADEMIC GUIDEBOOK
Academic Year 2012/2013

Faculty of Built Environment
Universiti Teknologi Malaysia
81310 Johor Bahru
Johor Darul Takzim

Every effort has been made to include updated information in this guidebook at time of printing. The faculty reserves the right to amend any information from time to time as deemed necessary.

This guidebook is published every academic year and is distributed to new students enrolled in programmes offered by the Faculty of Built Environment.

This guidebook contains brief information on the programmes offered by the faculty. Detailed information on academic matters can be obtained from the following documents:

- UTM Prospectus
- UTM Academic Regulations

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Content

UNIVERSITI TEKNOLOGI MALAYSIA

Philosophy

The divine law of Allah is the foundation for science and technology. UTM strives with total and unified effort to attain excellence in science and technology for universal peace and prosperity in accordance with His will.

Vision

To be recognised as a world-class centre of academic and technological excellence.

Mission

To be a leader in the development of human capital and innovative technologies that will contribute to the wealth creation.

Motto

In the Name of God for Mankind.

FACULTY OF BUILT ENVIRONMENT

Vision

To be an internationally recognised centre of excellence for educating professionals in the built environment.

Mission

To take the lead in the education of professionals in the built environment.

Main Task

To provide professional education for built environment studies.

Objectives

To establish an educational system aimed at producing professionally trained graduates able to produce effective creative work whilst adhering to the rules and regulations stipulated by religion, cultural heritage and the built environment.

To utilise available expertise to tread new territories, organise, execute and participate in activities of research, publication, consultancy and voluntary work with other organisations.

Foreword by the Dean

Welcome to the Faculty of Built Environment (FAB) Universiti Teknologi Malaysia (UTM). I hope you find the information in this Guidebook helpful in understanding the programmes offered in the Faculty.

The faculty is one of the leading faculties offering postgraduate and undergraduate programmes in the field of Built Environment in Malaysia. It offers undergraduate degree programmes in Architecture, Urban and Regional Planning, Quantity Surveying, Landscape Architecture and Construction. Both undergraduate and postgraduate programmes offered by the Faculty are well established and well regarded by employers. The faculty put emphasis to carefully integrate each programme the academic knowledge and practical skills required for professional practice.

The University believes that apart from imparting technical knowledge, acquisition of generic skills is vital for graduates to be successful in the future. International exposure for example is the key to success in today's complex and dynamic world. It is important for the students to gain cultural awareness and insights into foreign policies to widen their knowledge in various aspects related to global issues and challenges. The opportunity for this exposure is in-built in the University's academic system through the internationalisation programmes, namely: global outreach, internship abroad, service learning and summer school programmes. The faculty strongly encourage students to participate in at least one of the internationalisation programmes during the period of their study.

I hope that all students will show great interest by taking part in all faculty academic activities as well as portray an optimistic work culture with positive moral values in order to develop leadership qualities and individual generic skills. This is important not only for individual academic excellence but will also contribute to the development of the nation, coherent with the government's aspiration to become a developed country socially, culturally and politically.

If you have any questions after reading through this guidebook, please do not hesitate to seek advice from your lecturers, academic advisers and from the faculty's administrative staff during the period of your study. You may also wish to visit FAB's website at: www.fab.utm.my.

Good Luck.

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Introduction

Universiti Teknologi Malaysia

Universiti Teknologi Malaysia (UTM) is the largest engineering-based university in Malaysia offering a variety of programmes for all levels of education. It is located both in Kuala Lumpur, the capital city of Malaysia and Johor Bahru, the city in Iskandar Malaysia, a vibrant economic corridor in the south of Peninsular Malaysia.

UTM's mission is to lead in the development of creative and innovative human capital and advanced technologies that will contribute to the nation's wealth creation. This is in line with the aspiration of the country towards becoming a knowledge-based, innovation-led economy grounded in creativity and innovation with high value creation. Through a strategic transformation of its organisational structure, UTM is focused in creating a vibrant academic culture and fertile intellectual ecosystem that inspire creativity and innovation.

With a strength of more than 2,000 academic staff, of which more than 200 are international graduate faculty members, UTM continuously strives to develop and enhance quality academic and professional programmes of international standard and global recognition. The student population consists of more than 15,000 full-time undergraduate students, more than 6,000 enrolled in distance learning programmes as part-time students and more than 8,000 postgraduate students in various fields of specialisation. More than 2,000 of these students are international students.

UTM has established a reputation for cutting-edge research undertakings and innovative education, proven by becoming the three-time winner for the National Intellectual Property Award for organisation category. A stimulating research culture exists in UTM through 11 Research Alliances (RA) in strategic disciplines namely Sustainability, Infocomm, Water, Cybernetics, Biotech, Construction, Materials & Manufacturing, K-Economy, Energy, Transportation and Nanotechnology. In addition, there are 28 Centres of Excellence to service technological education and research needs of the university.

UTM is actively engaged in research collaboration with renowned institutions such as Harvard University, MIT, University of Oxford, Imperial College of London, University of Cambridge, Tokyo University and Meiji University in areas of mutual interests.

Faculty of Built Environment

The Faculty was initially established in 1970, which was then known as the Faculty of Architecture. In 1974 it became the Faculty of Built Environment and now comprises of the departments of Architecture, Quantity Surveying, Town and Regional Planning and Landscape Architecture. Currently, these Departments offer Bachelor of Architecture, Bachelor of Quantity Surveying, Bachelor of Urban and Regional Planning, Bachelor of Landscape Architecture and Bachelor of Science in Construction.

In addition to the undergraduate programmes, the faculty also offers postgraduate programmes at both the MSc and PhD levels in fields related to architecture, quantity surveying, urban and regional planning, landscape architecture and construction management. The student population in the faculty totals to about 1500, including about 250 international students.

The undergraduate programmes are designed to provide a firm academic base and professional expertise in the respective disciplines. The Faculty uses its strong industry links to focus on current topics, skills in demand now and in the future. Students are encouraged to undertake real-world projects and participate in international exchange and global outreach programmes. All undergraduate degree programmes in the faculty are recognised by the Public Service Department of Malaysia and accredited by the respective governing boards of local as well as international professional institutions relevant to the programme. A degree from the Faculty of Built Environment will keep graduates at the forefront of national and global agendas in construction, design, and development sectors.

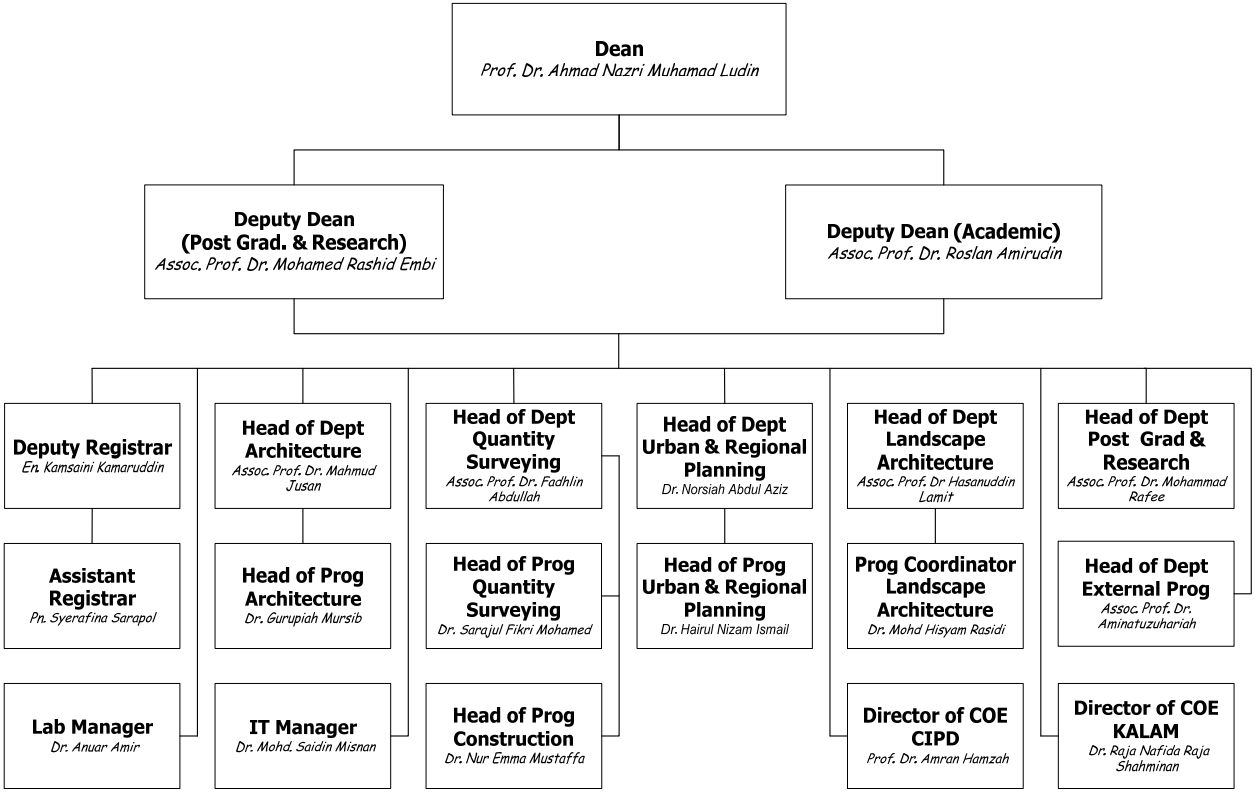
The Faculty of Built Environment is committed to making a significant and positive impact on the country by combining academic strength with industry partnerships which are at the forefront of dealing with some of the major issues facing the nation today. Sustainability and integrated practice continue to define our teaching and research excellence.

With a staff of more than 110 academics, 60 supporting staff and our excellence in real world teaching, research and consultancy service, the faculty aspires to be a destination of choice for high quality academics

Administration and Staff of the Faculty

Administration

Organisation Structure



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Bachelor of Science in Architecture

Introduction to the Programme

Architecture is the art and science of building. It's activities encompass the design, development and planning of the built environment as well as managing the construction process. Architects play the key role in creating buildings and habitats that serve as integrated solutions to issues and contexts as diverse as design, research, practice, construction, socio-culture, human behaviour, history, and the environment. An architect's design could extend from working places and simple individual living, to communal and urban living of the society. Such role demands highly professional and ethical individuals in creating better built environment. The Bachelor of Science in Architecture programme at UTM is designed to produce individuals that can fulfil this role.

The Bachelor of Science in Architecture Programme is a professional degree that is equivalent to the professional qualification of the Board of Architects Malaysia Part I, which is the first part of a two tier architecture programme. The programme emphasise on architectural design skill based studio projects and the complementary courses. Competent skills and knowledge addressed within the programme, contribute to the development of architecture within the National framework, for sustainable development.

The continuation of the Board of Architects Malaysia Part II is addressed in the Master of Architecture programme.

Name of Award

Bachelor of Science in Architecture [B. Sc. Arch.]

Philosophy

The programme is committed to academic and professional competency as prerequisites to advance in the architectural world. This program provides a holistic approach for students to excel in architecture through creative knowledge, technology and conviction towards the development of a caring and sustainable built environment.

Aim

The aim of the programme is to train and produce qualified professional architects (LAM Part I) with a degree of Bachelor of Science in Architecture. The program provides essential knowledge and skills in the core areas of design, communication, technology, environment, culture and practice; while committed to develop students' creative, innovative and versatile qualities with the essential generic skills and ethics required.

Programme Educational Objectives

Bachelor of Science in Architecture has 4 programme educational objectives:

PEO1 To produce graduates who are knowledgeable and competent in line with the professional qualification of Board of Architect Malaysia Part I.

PEO2 To produce graduates who are able to solve design problems based on sound facts and idea.

PEO3 To produce graduates who are professionally ethical, aware and responsive to the values of humanity and sustainability.

PEO4 To produce graduates who are competitive, effectively communicative and contributive to working teams.

Programme Learning Outcomes

The intended learning outcomes of the Bachelor of Science in Architecture programme are:

PO1 Able to discuss, articulate and apply knowledge in relation to culture, environment, technology and practice in architecture and the related field.

PO2 Able to apply techniques, skills and theories of design, communication, technology, environment, culture and practice into architectural design work.

PO3 Able to identify, analyze and evaluate and solve issue or design problem, issues, or tasks by integrating knowledge in design, to conclude and produce alternative solution.

PO4 Able to convey ideas, express rationale, and provide solutions clearly in verbal and graphic in an appropriate form for a given audience.

PO5 Able to interact, collaborate and negotiate responsibly within team of colleagues and/or community.

PO6 Able to acquire resource, select, retrieve, evaluate, and manage information from various sources; appreciate new ideas and be capable of independently learn new skill/knowledge/new concept in architecture.

PO7 Able to demonstrate ethical values in executing tasks and projects to protect the environment and society acting as steward of the Earth.

PO8 Able to demonstrate the ability to initiate, lead, motivate and coordinate a team towards knowledge acquisition, architectural production or goal achievement.

PO9 Able to acquire entrepreneurship knowledge and skills in architectural and related creative endeavours and enterprises.

Programme Accreditation

The Bachelor of Science in Architecture programme is recognised by the Board of Architects Malaysia (LAM), Malaysian Institute of Architect (PAM) and Public Service Department (JPA). The UTM architecture programme is the first in the country acknowledged by PAM and LAM. The 3 year Bachelor of Science in Architecture is accredited for LAM/PAM Part I; and the following 2 year Master of Architecture is accredited for Part II.

UTM degree holders with Bachelor of Science in Architecture followed by the degree in Master of Architecture, and 2 years experience are eligible to sit for the LAM Part III examination in order to be registered as professional architects.

Career Prospects

Graduates from this program are competent to work in both public and private sectors as architectural officer, assistant architect, building designer, project architect, project supervisor, design consultant and other architectural design based interests.

Mode and Duration of Study

Mode of Study: Full-time
Minimum Duration: 3 years
Maximum Duration: 5 years

Classification of Courses

Courses offered under this programme are based on the classification scheme shown in the table below:

Classification	Course Group	Credits	Total credit hours	Percentage
1. Programme Core	A. Design + Communication	61	100	83
	B. Technology & Environment	15		
	C. Cultural Context	15		
	D. Management Practice & Law	9		
2. Elective Courses	EA, EB, EC, ED Elective Courses	30	30	25
3. General Courses	F. General Courses	20	20	20
	Total credit hours to graduate		120	100

Award Requirements

To be eligible to graduate from this programme, students must complete a total of 120 credit hours or more, accumulated from courses set according to the classification scheme shown, with a minimum CGPA of 2.0.

List of Courses According to Semester

Year 1

Semester 1

Course	Course Group[1]	Prerequisite	Credit	Total Credit
1. SBEA1118 Design 1	A		8	18
2. SBEA1213 Architectural Communication	A		3	
3. SBEA1513 Architectural History & Theory	C		3	
4. UICI1012 Islamic and Asia Civilisation	F		2	
5. UHAS1172 Dynamic Malaysia (Local) 6. UHAS1162 Arts, Custom & Belief of Malaysian (International)	F		2	

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEA1128 Design 2	A	SBEA1118	8	18
2. SBEA1223 Basic Architectural Computing	A		3	
3. SBEA1313 Structure and Construction 1	B		3	
4. ULAB1112 English for Academic Communication	F		2	
5. UHAS2122 Critical and Creative Thinking	F		2	

Short Semester

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEA1913 Elective D (Construction Practice)	ED		3	6
2. SBEA1923 Elective D (Outreach)	ED		3	

.

Year 2

Semester 1

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEA2138 Design 3	A	SBEA1128	8	18
2. SBEA2713 Elective B (Environmental Science & Sustainability)	B		3	
3. SBEA2523 Theory of Design	C		3	
4. UICI2022 Science, Technology & Mankind	F		2	
5. UHAS2092 Professional Ethics (Local) 6. ULAM1112 Malay Language for Communication (International)	F		2	

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEA2148 Design 4	A	SBEA2138	6	18
2. SBEA2323 Building Services	B		3	
3. SBEA2813 Elective C (Theory of Modern Arch)	EC	SBEA1513	3	
4. ULAB2112 Advance English for Academic Communication	F		2	
5. UHAS3102 Entrepreneurship and Enterprise Development	F		2	

Short Semester

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEA2823 Elective C (Heritage Studies)	EC	SBEA1513	3	6
2. SBEA2933 Elective D (Measured Drawing)	ED	SBEA1313	3	

Year 3

Semester 5

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEA3158 Design 5	A	SBEA2148	8	18
2. SBEA3623 Elective A (CADD & BIM)	EA	SBEA1223	3	
3. SBEA3723 Elective B (Structure & Construction 2)	EB	SBEA1313	3	
4. SBEA3833 Elective C (Arch Theory & Criticism)	EC	SBEA1513	3	
5. UQX1XX1 Co-Curricular (Leadership)	F		1	

Semester 6

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEA3169 Design 6	A	SBEA3158	9	18
2. SBEA3733 Elective B (Bldg Integration Performance)	EB	SBEA1313 SBEA2713 SBEA2323	3	
3. SBEA3413 Architectural Management & Practice	C		3	
4. ULAB3152 Effective Oral Communication Skills	F		2	
5. UQX1XX1 Co-Curricular (Wood Carving)	F		1	

List of Elective Courses

Course	Course Group	Prerequisite	Credit
ELECTIVE GROUP A (EA)			
1. SBEA3613 Digital Visualization	EA	-	3
2. SBEA3623 CADD & BIM	EA	-	3
Choose one (1) from this group			
ELECTIVE GROUP B (EB)			
1. SBEA2713 Environmental Science & Sustainability	EB	-	3
2. SBEA2723 Structure and Construction 2	EB	-	3
3. SBEA3733 Building Integration Performance	EB	-	3
4. SBEA3743 Energy Conscious Design	EB	-	3
Choose three (3) from this group			
ELECTIVES GROUP C (EC)			
1. SBEA2813 Theory of Modern Architecture	EC	-	3
2. SBEA2823 Heritage Studies	EC	-	3
3. SBEA3833 Architectural Theory and Criticism	EC	-	3
4. SBEA3843 Architecture and Human Behaviour	EC	-	3
Choose three (3) from this group			
ELECTIVES GROUP D (ED)			
1. SBEA1913 Construction Practice	ED	-	3
2. SBEA1923 Outreach	ED	-	3
3. SBEA2933 Measured Drawing	ED	-	3
Choose three (3) from this group			

Total credit of Elective EA + EB + EC + ED = 30

Programme Implementation

The programme is delivered using a variety of approaches:

1. Problem-Based Learning in Studios
   For the core Design courses, design learning takes place mostly in studio-based environment, where students learn through design projects in designated workspace within the Year. Students in each year are divided into smaller groups of not more than 15. The groups will be allocated to a studio master. The small group will ensure that each student's uniqueness and individual creativity be catered for. Uniqueness and individual creativity is an important virtue that the department upholds. The studio is an active student-centred learning place, a rich laboratory to produce competency, innovation and creativity.

2. Subject & Theory Learning
   Complementary to the studio project-based learning is the theory input. Categories of theory are Communication, Cultural Context, Technology and Environment, Management and Practice and Law.

3. Practice Learning Environment
   Design Studio is carried out similar to an office environment. The Studio Master acts as the office principle whereas students are the staffs. In more advance cases students are to take the role of the leader for the office environment. Students are required to show discipline and professionalism required in architectural firm. Occasionally professional architects and expert inputs are brought in to provide the balance between practice and academia, thus reducing the gap and prepare the students to excel within both worlds. Some hands on approach adopted by the studio is also another form of practice learning environment.

4. Research Base-Learning
   Various research-based subjects promote inquisitive and systematic thinking skills and contribute to the body of local as well as world knowledge. The product of Malaysian Architectural Heritage research-based subject, for example has contributed to the nation's largest collection of architectural heritage documentation, the learning products are now a wealth of knowledge, and these products are kept in Center for the Study of Built Environment in the Malay World (KALAM) and Library.

5. Laboratory Testing & Simulation versus Hands on Workshop
   The programme encourages students to learn through Building Science Laboratories and Computer Graphics testing and simulation. The students also learn from hands on approach in building workshop. These enable students to experience both real as well as virtual understanding of learning.

6. Seminars, Workshops and Exhibition
   The programme becomes venues for various intellectual platforms to allow dispersal and sharing of knowledge. Seminars, workshops and exhibitions take place at school to national, and even international levels.

7. National & International Competition
   The programme promotes student/staff participation in both national and international competitions. This is important as a yardstick to measure our standing as the leading architecture school. The Department views competition as one of the instrument to gauge staffs' and students' performance and ability beyond academic realm of campus boundary.

8. Field Study
   The programme ensures architectural learning through firsthand experience of real places. Studio trips are organised each semester to visit buildings, places, sites, as well as architects offices.

9. Global Outreach, Student Exchange & Internationalisation
   The University promotes global outreach, student exchange and other internationalisation activities through subsidised schemes. The participating student will experience working with international partners thus expanding to greater horizon. The enrolment of international students in the programme also enriches learning experience within a multi-cultural environment.

Student Academic Assessment

A variety of assessment methods are used to match the learning outcomes of programme and students learning styles.

1. **Design projects**: to assess competence in practical skills, techniques and problem solving; and skills/values to professionalism.

2. **Comprehensive design projects**: to assess competence in architectural project and skills/values to professionalism.

3. **Architectural, oral, visual & multimedia presentations**: to assess effective architectural communication and presentation skills.

4. **Case/field studies**: to assess reasoning skills and ability to derive learned material from real-life situations.

5. **Examinations, tests and quizzes**: to assess breadth of knowledge.

6. **Assignments**: to assess independent aspect of learning, which includes gathering of relevant information, analysis and presentation of findings. to assess ability to work independently and collaboratively.

7. **Comprehensive Design Project Report:** to assess full systematic process and comprehensiveness of project solution.

8. **Peer/self review**: to assess generic skills mainly team working, lifelong learning, ethics, leadership, entrepreneurship.

Syllabus Synopses

Syllabus synopses listed under this section covers only the core and elective courses offered in this programme. Syllabus synopses for university courses are listed in the University General Courses section.

SBEA1118 Design 1

Design 1 introduces the essential fundamental theories in architecture. Students undergo a series of projects to heighten their awareness of themselves, their reactions and perceptions towards the environment, graphical communications, anthropometrics; and experimentations in two and three dimensional composition, colour, geometry, texture and form of structures. This stage also includes art/graphic appreciation, elements of design, and principles of design, architectural graphics and rendering techniques.

SBEA1128 Design 2 (Pre-requisite SBEA1118 Design 1)

In Design 2, students exploring the process of designing basic architecture and the ability to synthesize various parameters of architecture. Several short projects cover the essential parameters to explore: construction & materiality; site and environmental response; user needs and form identity. Learning includes building workshop, site testing material experiment; structural, site, environmental analysis; construction form expression, site design response, client response, design process, design documentation and architectural illustration.

SBEA2138 Design 3 ((Pre-requisite SBEA1128 Design 2)

Design 3 Studio explores architectural themes related to the socio-cultural framework of design. It focuses on the paradigm of socialist and culturalist/regionalist in socio-cultural pursuit and continuing regional attributes through design project. The course leads to an appreciation of social, tradition and inculcate deeper understanding of human values within the function of built environment. It promotes specific frameworks for community-based, regionalism-based and vernacular-based design activities.

SBEA2148 Design 4 (Pre-requisite SBEA2138 Design 3)

The main intention of second year second semester design course is to develop the students' ability to become a 'Translator' designer within the environmental design paradigm. The intelligent design process will include alternative design process (environmental), analytical thinking, site/space planning, concept, generation, working model, design synthesis and communicating architecture. The feasibility study will

include client-user analysis, program analysis, site analysis and case studies. The design inquiries will include objectives, identity, values, aspiration, behavioural, communal, structure, construction, space planning, site planning, space-form, space-making, place-making, building regulations and building by law. At the end of the course the student will have the ability to design a medium low complexity building for a small group of user.

SBEA3158 Design 5 (Pre-requisite SBEA2148 Design 4)

This course requires students to explore the integrator role through pragmatic design approaches for medium complexity buildings and its environment. Students will be required to design an integrated building system that includes structure, facilities, services, construction/building detailing, materials and the tectonic potentials. Students should also demonstrate ability to communicate their design solution architecturally, graphically and verbally.

SBEA3169 Design 6 (Pre-requisite SBEA3158 Design 5)

The comprehensive design project & dissertation at 3rd year final semester aims to test students in comprehensiveness and sensitivity to the design problem. They are required to identify, comprehend & apply architectural knowledge such as building integration system, composite technology, social and sustainability issues plus building regulation leading to building brief formulation of a medium high complexity project. They are then required to integrate all the knowledge above to produce a final comprehensive design proposal that is of buildable.

SBEA1213 Architectural Communication

The course is to introduce the students to the use of communication and its role in the architecture. These will be the basic concepts of skills in manual techniques, architectural graphics skills, photography, verbal presentation, model making and story-board. The goal is to provide students with generalised skills and structured knowledge. The first part of these series cover issues related to manual techniques in presentation i.e. dry and wet technique, architectural graphics such as drawing presentations and draughtsmanship. The second part cover the basic two-dimensional representation, i.e., photography and 2D and 3D model making. The third part of the series focuses on the issues related to applying the techniques into painting or story board, i.e., painting, model making and making story board such as comics.

SBEA1223 Basic Architectural Computing

Students undergo a series of exercises to expose themselves to the multitude of software available and familiarize themselves with what each software is for, what it can and cannot do in the context of architectural education. At the end of the day, the students will be able to identify and utilize the correct software in architectural sketch modelling, graphics and 2D CAD to achieve specific objectives, as well as build a foundation for them to familiarize themselves with other, more advanced software in the future.

SBEA1313 Structure and Construction 1

This course is about the conventional development of building structures and construction methods. This course deals with building construction based on four key materials namely, timber, steel, concrete, masonry and other composite to provide the students with basic knowledge of these materials and their applications in architectural short span (3-6m) design projects. Their various applications in different configurations of building components are expounded in the course. The lecture will be given based on the aspect of construction theory and application. To ease the training, the lectures are divided into two modules namely, Section 1: *Timber and Steel*, and Section 2: *Bricks and Concrete*

SBEA2323 Building Services

This course gives basic understanding on building sciences and services for both small scaled buildings as well as for medium complex buildings. Various topics are covered such as water supply system, surface water disposal system, waste and soil water disposal systems, electrical system, air conditioning systems, fire-fighting, lift and escalators, as well as security systems for the above building. Since the lecture emphasizes on the principles of the building systems, students are expected to engage in extra reading for better comprehension.

SBEA1513 History and Theory of Architecture

The main objective of the course is to create awareness of the many kinds of architectural theories and language of world architecture. The course provides an overview of the history of architecture in the world involving the Western and Eastern civilization; from classical to Modern times; with understanding of the social and cultural values, political traditions, technological advancement, economic achievements as well as the environment that influence the buildings and landscape.

SBEA2523 Theory of Design

Design is viewed as the core discipline of architectural practice. The course is an introduction to various essential knowledge and method of design within architecture and urban design context. It will cover the process and related parameters such as processes, methods and knowledge on planning, design creativity, space, form and place making; behavioural, culture and sustainability.

SBEA2413 Architectural Management and Practice

This course introduces students to the building industry, parties involved, and their relationship with architectural practice. It will cover aspects of professional core services of the architect practice in general. The students are exposed to relevant communication skills from design to practice, and from practice to all relevant parties in the building industry. Elements of building project managements such as culture, technologies, politic and financial as well as the methodologies involve in project management and construction management will be discussed. Students will also be exposed to the type and variation of practices and the different structures of architectural practices. Local governments/ authority involved in project management and their role, Uniform Building By-Law and other By-laws related to the building industry and the architectural professional practice will also be introduced.

SBEA3613 Digital Visualization (pre-requisite SBEA1223 Basic Architectural Computing)

The aim of the course is to enable students to apply a variety of software. The course also introduces more advanced scenarios for students to deal with in relation to producing more effective usage of the software prescribed and better CAD presentation. Students are assessed in their ability to integrate the use of various software in order to produce more comprehensive presentation. Further assessment includes the ability to employ 2D and 3D visual applications appropriately in conjunction with the use of relevant audio and video technology.

SBEA2623 CADD & BIM (pre-requisite SBEA1223 Basic Architectural Computing)

This course is an introduction to Building Information Modelling. The students will be exposed to BIM software available to assist them in producing a complete set of architectural working drawings with correct drawings conventions and format. The course also introduces more advanced scenarios for students to deal with in relation to produce more effective usage of the software prescribed and better CAD technical drawings and presentation. Students are assessed by their ability to integrate information in order to produce more comprehensive presentation. Further assessment include the ability to employ 2D and 3D visual applications appropriately in conjunction with the use of relevant audio and video technology.

SBEA2713 Environmental Science and Sustainability

The course will focus on improving the awareness of the complexity of environmental issues related to climate, solar heat, ventilation, natural lighting and sound on built environment. Exploring and learning from the primitive solutions towards understanding the basic passive climatic design principles and developing contemporary sustainable architectural solutions. Further, the course intends to provide the opportunity to conduct basic experiments on specific aspects of building performance with respect to climate, thermal comfort, natural ventilation, lighting and acoustics, both indoor and outdoor.

SBEA2723 Structure and Construction 2 (pre-requisite SBEA1323 Structure and Construction 1)

A continuation of course Structures and Construction 1, this course is on advanced performance of construction material such as timber, steel, concrete, masonry and other composites. The focus is on medium and long span building structure. The application of various construction materials for various building component such as roof, wall, floor and stairs is highlighted based on the most advanced and current construction technology. This course is conducted in two modules namely timber and steel; followed by concrete and bricks. It will also focus on simple calculations relating to sizing of beams, columns and slabs using depth to span ratios and safe load table's of reinforced concrete.

SBEA3733 Building Integration and Performance (pre-requisite SBEA1313, SBEA2713, SBEA2323)

The subject introduces the building systems integration concept for large building deliveries. A varied range of conventional and advanced building systems and their application in building design shall be introduced. The study also covers aspects of building performance appraisal.

SBEA3743 Energy Conscious Design (pre-requisite SBEA2713 Environmental Science and Sustainability)

The course gives emphasis on human comfort and energy saving concept and criteria in architecture and building design. The scope of the architecture solutions may be passive or mechanical that illustrates climatic understanding and the use of appropriate technological solutions in architecture design with particular emphasis on tropical climate.

SBEA2813 Theory of Modern Architecture (pre-requisite SBEA1513 Architectural History and Theory)

This course discusses issues relating to modern architecture involving the politics, technology and aesthetic aspect in the 19th and 20th century as well as study on various architectural theories and

approaches that has a significant impact on the Malaysian architecture scenario. The current approaches in local architecture include regionalism, conservation, sustainability and environment. The content on the four approaches cover the general idea and concept, theory, and philosophy.

SBEA2823 Heritage Studies (pre-requisite SBEA1513 Architectural History and Theory)

Extinction of traditional buildings in Malaysia has led the Department of Architecture, Faculty of Built Environment of UTM to take the initiative to document these traditional buildings in Malaysia and surrounding Malay world through one of its subject for second year students majoring in architecture. 'Historical and Cultural Documentation' is a course conducted through a combination of 2 levels of work which is of historical and cultural report writing workshop(4 weeks), and seminar (1 week). Because it is research oriented, the handling of this subject is in an ordered and strict control of the proposed conventions.

SBEA3813 Architectural History and Criticism (pre-requisite SBEA2813 Theory of Modern Architecture)

The course surveys contemporary architecture theory and criticism from 1950s to the present. It explores several theoretical tendencies in contemporary architecture since 1955 through close reading and discussion of original texts. These are Traditional, Postmodern, Postmodern Ecology, Late Modern, and New Modern. The aim is to understand the themes, positions, and values represented in each of these theoretical tendencies in the discourse.

SBEA3843 Design and Human Behaviour (pre-requisite SBEA2523 Theory of Design)

The course provides the environment for the practical application of theories of design processes and behaviours. The course concerns two types of interactions, i.e. designer-based and user-based design activities. Both aspects are strongly linked to the cognitive and behavioural aspects of designers as well as users within the designing environment and designer-stakeholder (e.g. users, clients) interactions. Students would be encouraged to develop critical, systematic and inquiry-based approaches in dealing with design tasks.

SBEA1913 Construction Practice

This subject would expose the students to real life construction site where the students are required to observe and record down what they have seen in the form of a log book and a final report.

SBEA1923 Outreach Program

This Outreach Program is conducted during the short semester. It is an organisation of a project that inculcates alternative self-learning and generic skill in related field of architecture. It can be an event management, competition, expedition, travelling (can be either in Malaysia or overseas-GOP). The programs may include students exchange with others universities, academic visit, service learning, event management and expedition. Basic requirements such as managing the transportation, accommodation, food, tools and equipments, safety and documentation are all organised by the students registered. Team working, attitude, leadership and entrepreneurship will be the criteria for assessment.

SBEA2933 Measured Drawing (pre-requisite SBEA1313 Structure and Construction 1)

Extinction of traditional buildings in Malaysia has led the Department of Architecture, Faculty of Built Environment of UTM to take the initiative to document these traditional buildings through one of its subject for second year students majoring in architecture. 'Building Survey and Documentation' is a course conducted through a combination of 3 levels of work, which is workshop (1 week), fieldwork (2 weeks) and studio work (4 weeks). Because it is research oriented, the handling of this subject is in an ordered and strict control of the proposed conventions.

Master of Architecture

Introduction to the Programme

The Master of Architecture Programme is a professional degree equivalent to the professional qualification of the Board of Architects Malaysia Part II. It is a continuation of the Board of Architects Malaysia Part I, which is addressed in the Bachelor of Science in Architecture programme in UTM. The programme is a taught course Masters Programme and as such there is a structured curriculum with an emphasis on more research based architectural design studio projects. This emphasis enables a more intellectual and theoretical basis in the architectural projects addressed within the programme at the same time contribute to the development of architecture within the National framework, that emphasises on the sustainable development. This is an addition to the technical, scientific and technological considerations that are already embedded within the courses.

Name of Award

Master of Architecture [M. Arch.]

Philosophy

The programme is committed to academic and professional competency as prerequisites to advance in the architectural world. This programme provides a holistic approach for students to excel in architecture through knowledge, creativity, technology and conviction for the development of a caring and sustainable built environment.

Aim

The aim of the programme is to provide academic excellence in Architecture. This is achieved through the cultivation and propagation of creativity as well as the understanding and innovative application of relevant technologies, based on research, in the quest for the development of sustainable and benevolent environments.

Programme Educational Objectives

Master of Architecture has 4 programme educational objectives:

PEO1 To produce graduates who are knowledgeable and competent whilst fulfilling the professional qualification requirements of the Board of Architects Malaysia Part II.

PEO2 To produce graduates who are in possession of scholastic characteristics in the aspects of research and are able to solve problems analytically, critically and creatively based on sound scientific approaches and ideas.

PEO3 To produce graduates who are ethical, professional, responsible and acutely aware of the values of humanistic sustainability.

PEO4 To produce graduates who are communicative and effectively contributive in working teams as well as competitive in the local and global markets.

Programme Learning Outcomes

The intended learning outcomes of the Master of Architecture programme are:

PO1 Able to analyse and interpret knowledge in the areas of humanities, history and culture, environment and technology, professional practice and by-laws, in relation to architecture and the building industry.

PO2 Able to accomplish designs that are coherent and based on critical thinking and supported by integrated research in culture, behaviour, environment, technology, use of materials and practice.

PO3 Able to solve problem and provide new solutions backed by research and critical thinking on various constraints of issues and problems; technology and nature; contextual and contemporary rationale; by the integration of knowledge in design, communication, technology, environments, culture and practice.

PO4 Able to communicate confidently and able to justify design solutions with the use of appropriate communication media to convince stake-holders and target groups

PO5 Able to organise and exhibit cooperative and collaborative professional team spirit in the execution of projects that involve group work

PO6 Able to organise to acquire new concepts and up to date knowledge that are relevant to architectural design, practice and research.

PO7 Able to carry out the responsibility professionally and ethically as one entrusted with the care of the environment and the community.

PO8 Able to manifest the ability to initiate, lead, motivate and coordinate the team in the search for knowledge, production of architectural design and attainment of goals.

PO9 Able to exhibit entrepreneurial knowledge and abilities in the exploration of the architectural industry and related creative industries.

Programme Accreditation

The Master of Architecture programme is recognised by the Board of Architects Malaysia (LAM), Malaysian Institute of Architect (PAM) and the Public Service Department (JPA). The architecture programme in UTM is the first in the country acknowledged by PAM and LAM. The preceding 3 year Bachelor of Science in Architecture is accredited for LAM/PAM Part I; and this 2 year Master of Architecture is accredited for Part II.

UTM degree holders in Master of Architecture with 2 years relevant working experience are eligible to sit for the LAM Part III examination in order to be registered as professional architects.

Career Prospects

Graduates from this program are competent to work in both public and private sectors as architectural officer, graduate architect, building designer, project architect, project supervisor, design consultant and other architectural design based interests.

Mode and Duration of Study

Mode of Study: Full-time
Minimum Duration: 2 years
Maximum Duration: 4 years

Classification of Courses

Courses offered under this programme are based on the classification scheme shown in the table below:

Classification	Course Group	Credits	Total credit hours	Percentage
1. Programme Core	A. Design + Communication (including research methodology)	39	66	91.7
	B. Technology & Environment	6		
	C. Cultural Context	6		
	D. Management Practice & Law	9		
	E. Design Dissertation	6		
2. Elective Courses	F. Elective Courses	3	3	4.2
3. General Courses	G. General Courses (University Elective)	3	3	4.2
	Total credit hours to graduate		72	100

Award Requirements

To be eligible to graduate from this programme, students must complete a total of 72 credit hours or more, accumulated from courses that are set according to the classification scheme shown in Sub-Section 10, with a minimum CGPA of 3.0 and have completed all the relevant courses within the time allowed.

List of Courses According to Semester

Year 1

Semester 1

Course	Course Group	Prerequisite	Credit	Total Credit
1. MBEA1119 Design Pre-thesis1	A		9	18
2. MBEA1313 Adv Architectural Tech & Integrated Environment	B		3	
3. MBEA 1413 Architectural Practice Management	D		3	
4. MBEA1613 Architectural Research Methods	A		3	

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. MBEA1129 Design Pre-thesis 2	A		9	18
2. MBEA1423 Law & Practice	D		3	
3. MBEA1513 Current Issues in Architectural theory and Design	C		3	
4. UHAW6023 Philosophy of Science and Social Development	G		3	

Year 2

Semester 1

Course	Course Group	Prerequisite	Credit	Total Credit
5. MBEA2139 Design Pre-thesis 3	A		9	18
6. MBEA2323 Advanced Architectural Technology & Construction	B		3	
7. MBEA2433 Project & Construction Procurement	D		3	
8. MBEA2XX3 Elective	F		3	

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
9. MBEA2149 Design Thesis	A		9	18
10. MBEA2443 Professional Practice	D		3	
11. MBEA2626 Design Thesis Dissertation	E		6	

List of Elective Courses

Course	Course Group	Prerequisite	Credit	Total Credit
1. MBEA2713 Space Syntax: Architectural Spatial Analysis	F		3	12
2. MBEA2723 Program Outreach	F		3	
3. MBEA2743 Advanced Architectural Computing	F		3	
4. MBEA2753 Energy Conscious Design	F		3	

Choose one (1) course only

Programme Implementation

The programme is delivered using a variety of approaches:

1. Project-based Learning in Design Pre-thesis Studios
   For the core Pre-thesis Design courses, design learning takes place mostly in a studio-based environment, where students learn through research and theory based design projects in designated workspaces of not more than 15. The groups will be allocated to a studio master. The small group will ensure that each student's uniqueness and individual creativity are catered for. Uniqueness and individual creativity is an important virtue that the department upholds. The studio is an active student-centred learning place, a rich laboratory to produce competency, innovation and creativity. The three pre-thesis courses are centred on socio-cultural, sustainability and urbanism.

2. Project-based Learning in Design Thesis Studios

3. For Design Thesis studio, students may decide to pursue in-depth learning in any of the three research areas (socio-cultural, sustainability and urbanism). Design learning takes place in independent studios, led by panel heads, followed by co supervisors. Students will be assessed progressively in stages of crit, followed by final thesis assessment.

4. Practice Learning Environment
   Design Studio learning is carried out similar to an office environment. The Studio Master acts as the office principle and the students are the staff. In more advance cases students are to take the role of the leader for the office environment. Students are required to show discipline and professionalism required in a firm. Occasionally professional architects and expert inputs are brought in to provide the balance edge between working and academic, thus reducing the gap and prepare the students to excel within both worlds. Hands on approach adopted by the workbases is also another form of practice learning environment.

5. Research Base-Learning
   Design Pre-thesis and Design Thesis are both supported by research spearheaded by department/faculty research group members. Various research-based courses promote mini research in various fields, whereas inquisitive and systematic thinking skills is thought in Research Methodology courses.

6. Laboratory Testing & Simulation versus Hands on Workshop
   The programme encourages students to learn through Building Science Laboratories and Computer Generated Modelling and Simulation. The students also learn from hands on approach in building workshop. These enable students to experience both real as well as virtual understanding of learning.

7. Subject & Theory Learning
   Complementary to the studio project-based learning is the theory input. Categories of theory are Cultural Context, Technology and Environment, Management, Practice and Law. The lecture halls and classrooms are well equipped with computer, internet connection, LCD projectors and OHP. Smart classroom equipped with all teaching and learning facilities such as smart boards, video and audio. Labs equipped with the relevant software and hardware.

8. Seminars, Workshops and Exhibition
   The programme is the intellectual platform for the dispersal and sharing of knowledge.in architecture. Seminars, workshops and exhibitions take place at school level to national level, and even to international level.

9. National & International Competition
   The programme promotes student/staff participation in both national and international competitions. This is important as a yardstick to measure the departments our standing as the leading architecture school. The Department views competition as one of the instrument to gauge staffs' and students' performance and ability beyond academic realm of campus boundary.

10. Field Study
    The programme ensures architectural learning through firsthand experience of real places. Studio trips are organised each semester to visit buildings, places, sites, as well as architects offices.

11. Global Outreach, Student Exchange & Internationalisation
    The University promotes global outreach, student exchange and other internationalisation activities through subsidised schemes. The participating student will experience working with international partners thus expanding to greater horizon. The enrolment of international students in the programme further enriches learning experience within a multi-cultural environment.

Student Academic Assessment

A variety of assessment methods are used to match the learning outcomes of programme and students learning styles.

1. **Design Pre-Thesis Projects**: to assess competence in practical skills, techniques and problem solving in design, and skills/values to professionalism.

2. **Design Thesis Projects**: to assess competence in theoretical and/or technical application in architectural design projects; and skills/values to professionalism.

3. **Examinations, tests and quizzes**: to assess breadth of knowledge.

4. **Assignments**: to assess independent aspect of learning, which includes the gathering of relevant information, analysing and presenting findings, to assess ability to work independently and collaboratively.

5. **Architectural, oral, visual & multimedia presentations**: to assess effective architectural communication and presentation skills.

6. **Case/field studies**: to assess reasoning skills and ability to derive learned material from real-life situations.

7. **Seminar papers**: to assess ability to scholarly research, write and share academic knowledge.

8. **Dissertation/Research report**: to assess ability to systematic research process; from problem identification, literature review, analyse data and presentation of findings and contribution in scholarly manner.

9. **Peer/self review**: to assess generic skills mainly teamworking, lifelong learning, ethics, leadership, entrepreneurship.

Syllabus Synopses

MBEA1119 Design Pre-Thesis 1

Design Pre-Thesis 1 is an advanced level design that focuses on the impact of cultural ritual, social values and political concepts on architecture and housing. The emphasis is on a critical architectural research to cultivate greater understanding of the meaning of forms and space specifically from social, political and cultural perspectives.

MBEA1129 Design Pre-Thesis 2

Design Pre-thesis 2 is an advanced level research-based design focusing on urbanism. Understanding of macro and micro relationships in the context of urbanism is of utmost importance in this exercise. Based on a firm understanding of the urban fabric and its relationship with the built environment, this design studio integrates various elements related to architecture in a larger perspective, such as socio-cultural elements, contextual development and the local community as a whole.

MBEA2139 Design Pre-Thesis 3

Design Pre-Thesis 3 is an advanced level design that focuses on complex building design, where the aspects of building technology, efficiency, by-laws, construction and economy are emphasized. The integration based on researches conducted on climate, impact planning on the immediate surroundings and green building aspects will form the core for this studio and are substantially required.

MBEA2149 Design Thesis

The Design Thesis under the Masters Studio is the final major design exercise in the training of the architect to apply his or her accumulated knowledge and maturity gained throughout his/her formal education. It provides a unique opportunity for the students to pursue their own interests in architecture and the built environment derived from research-based design studies or architectural solutions achieved in any of the previous three studios (Design Pre-Theses 1, 2 or 3).

MBEA1313 Advanced Architectural Technology & Integrated Environment

The course gives emphasis on human comfort and energy saving concepts and criteria in architecture design. It considers on specific aspects of building performance in relation to its context, concepts and techniques needed in environmental design. Building Information Modelling (BIM) is an integrated process, which foresees a holistic integrated working experience of total building performance. It looks at techniques involved in integrating the environmental performance and material performance of the envelope and space and methods of measuring the above in a design. The scope of the architecture solutions may be passive or mechanical that illustrates climatic understanding and the use of appropriate technological solutions in architecture design with particular emphasis on tropical climate. BIM tools are used to analyze the environmental performance of building.

MBEA2323 Advanced Architectural Technology & Building Construction

The course integrates innovatively the structure, services, current technology, building specifications and their influence on building economy. It is taught as a subject with the main intention of putting into perspective the actual dealings of Building Requirements when they are put together. A varied range of advanced construction building systems, IBS building systems and their application in building design is elaborated. BIM tools are used to analyze the integrated technology and construction systems of a project. (Integrated with MBEA2139 Design Pre-Thesis 3)

MBEA1413 Architectural Practice Management

This course discusses architectural practice and management in relation to The Architect Act, the building industry and the interface with parties involved. The modules include registration of LAM and PAM, architectural set up, appointment of architect consultant, core services, building economics, feasibility studies, professional fee, managing parties in building industry, arbitration etc. The professional core services include schematic design, design development, contract document and tender; and implementation and supervision. Architect's responsibilities and obligations, relevant communication skills and interface from design to practice, and from practice to all relevant parties in building industry will also be included.

MBEA1423 Law and Practice

This course will enhances the students legal knowledge and principles of law involved in Architectural Practice. The students will be exposed to principles of law such as the Architects Act, Architects Rule, Uniform Building By-law and other By-laws related to the Building Industry and the Architectural Professional Practice. Through the knowledge of these By-laws, students are also exposed to the

importance of By-laws in architectural design, contract management and project management in the Professional Practice. Students will be exposed to aspects of professionalism of Architects, the legislation that govern the practice of the architectural profession (Architects Act 1967).

MBEA2433 Project and Construction Procurement

The course prepares the students with the general expectation of an architect. This is to ensure the students shall be readily adaptable to the working environment of the profession on graduation. It is intended to mature the students understanding on the concept of the architect role in building contract and analysis of the types of building contract commonly used in the practice. Students will be introduced to the economics relating to architectural design and planning. It is also to develop students' sense of market economics, pricing description through comparative methods. Through the basic understanding of economics, students will also be able to develop feasibility reports and project cash flow analysis. Students will be taught on matters involving tender and contract which architects must be conversant with. The course covers the tendering documents and procedure, so as to familiarise students with the duties, responsibilities and power of an architect when administering building contracts.

MBEA2443 Professional Practice

This course exposes students to the methodology of Professional Examination (LAM Part 3) and emphasises on the syllabus related to the exam. This course is to prepare the student for the LAM Part 3 exam through workshops on practical training, log-book writing, oral and written examination. Students will also be able to develop their professionalism and ethics in current contemporary practice. In the later part, the course discusses the legal implication in decision-making, architect's legal understanding in relation to related parties, and current legal issues that would affect the profession. The students are expected to register with Lembaga Arkitek Malaysia (LAM) and Pertubuhan Arkitek Malaysia (PAM) as student member.

MBEA1513 Current Issues of Architecture and Urbanism

The course delivers a series of lecture on contemporary issues of planning theory and urban design in the interdisciplinary context of socio cultural urbanism. The focus of the course is to discuss, understand, and analyse current theories, issues, trends, and phenomena of ideology, form, process, production, institution, agency and practice of architecture and urbanism.

MBEA1613 Architectural Research Method

This course introduces the process of formulating appropriate research methodology before applying it as an activity of critical inquiry in the field of interest. The inquiry on the specific topic to be explored is done through direct observation, content analysis study or by identifying issues and problems from primary or secondary sources. Eventually students are to write up the architectural topic of analysis as a final report using the necessary skills gained throughout the course.

MBEA2626 Design Thesis Dissertation

The Design Thesis Dissertation is the final major academic exercise in the Masters Programme. The purpose of this course is to pursue a strong academic rigor in the students in exploring deeper by researching into a topic of interest spawned from their previous studies in Design Pre-Thesis 1, 2 and 3. Through this course the students will be able to venture into an architectural issue without having to explicitly produce an architectural solution, but still producing a thorough and meticulous exploration of its potential solutions.

MBEA2713 Space Syntax: Architectural Spatial Analysis

This course introduces Space Syntax (SS) as a set of techniques for the analysis of spatial configurations of all kinds, especially where spatial configuration seems to be a significant aspect of human affairs, as it is in buildings and cities. When first started, SS is originally conceived as a tool to help architects simulate the likely effects of their designs, it has since grown to become a tool used around the world in a variety of research areas and design applications. It has been extensively applied in the fields of architecture, urban design, planning, transportation and interior design.

MBEA2723 Outreach Program

The outreach program has no lectures, but a meeting to organise an agreed destination for the architecturally related program (either local or overseas). The programs may include student exchange with other universities, academic visit, event management and expedition. Basic requirements such as managing the event, transportation, accommodation, food, tools and equipment, safety and documentation are all organised by the students. Team working, leadership, attitude, report writing and successful participation in the program are the criteria for assessment. Students are also required to carry out entrepreneurship activities to raise funds independently for travel.

MBEA2743 Advanced Architectural Computing

This course exposes students to the specialised realm of computer-assisted design, building information modelling and the virtual environment. Existing knowledge of software like Autodesk AutoCAD and Revit will form the basis for the more advanced uses, particularly in building information modelling and integrated usage. Due to the nature of this subject, students are expected to already have acquired the basics in computing, architectural design modelling and presentation, and are already familiar with the software related to it.

MBEA2753 Green building Design

This course enables students to specialise further into Green Building Design. Students are required to critically address, analyse and propose possible future design concept and idea to current building problems using green building design concept. The area of green building design research is vast and in this course the individual students' interests are further enhanced through research assignments proposed by the student.

Bachelor of Quantity Surveying

Introduction to the Programme

Project development is an investment that involves considerable sum of money and time. Clients will expect their project to generate values from their investment. They also expect value for money from their projects which involve the element of time, cost and quality. These objectives can be achieved through technical knowledge and professional competency, economics evaluation, effective cost management and selection of appropriate construction procurement with efficient and effective contract management. The role of quantity surveyor through their education, training and experience will contribute to the effective management of construction cost, project procurement and contract administration as well as giving advice on development economics and contractual matters.

The programme has been designed to offer graduates the opportunity to operate within the existing framework of the Quantity Surveying discipline, the construction industry and related fields. At a personal level, the graduate will be stimulated to adopt a professional and ethical approach that will allow personal development, foster self-respect and improve career aspirations.

Name of Award

Bachelor of Quantity Surveying [B. QS]

Philosophy

The programme is designed to provide a solid academic base and professional expertise in the discipline of Quantity Surveying whilst at the same time develop the students' knowledge, intellectual and analytical capability, creativity and problem solving ability. It also addresses the generic skills and capabilities necessary to compete in the employment market.

Aim

The aim of the programme is to produce Quantity Surveying graduates who are creative, innovative and versatile with a sound knowledge in construction cost management, administration of tender and construction contracts, and quantification and documentation of construction works; as well as meeting the needs of the nation and able to compete globally.

Programme Educational Objectives

Bachelor of Quantity Surveying has 5 programme educational objectives:

PEO1 To provide graduates with solid foundation in management and technical knowledge, skills and capabilities in the field of Quantity Surveying.

PEO2 To produce graduates who are effective problem solver, knowledgeable in applying logical, critical and creative thinking to a range of problems.

PEO3 To provide graduates with a broad knowledge, leadership and managerial skills which are necessary for the effective delivery of construction projects.

PEO4 To produce graduates capable of executing their responsibilities with professionalism and capable of lifelong learning in the pursuit of personal development and betterment of society.

PEO5 To provide graduate with basic communication skills, lead effectively and able to work collaboratively and in a multidisciplinary team.

Programme Learning Outcomes

The intended learning outcomes of the Bachelor of Quantity Surveying programme are:

PO1 Capable of acquiring knowledge and understanding of quantity surveying and related knowledge and practices

PO2 Capable of applying the theories and practices of building economics, construction measurement, construction procurements and contracts, construction technology, and professional practices

PO3 Capable to think critically and use scientific approach to solve quantity surveying related problems

PO4 Capable to communicate effectively with confidence orally, visually and in written form

PO5 Capable to establish responsible interpersonal and intrapersonal relationship with good team working spirit

PO6 Capable to apply high ethical and moral standards in professional practices and social interaction

PO7 Capable to seek information and accept new ideas, and learn independently

PO8 Capable to use knowledge and managerial skills to identify potential business opportunities

PO9 Capable of demonstrating leadership skills and proactiveness

Accreditation

The Bachelor in Quantity Surveying programme is recognised by the Public Services Department (JPA), and accredited by the Board of Quantity Surveyors, Malaysia and the Royal Institution of Chartered Surveyors (RICS), United Kingdom.

Graduates of this programme are eligible to register with the Board of Quantity Surveyors, Malaysia to become registered graduate Quantity Surveyors. As the degree is internationally accredited, graduates can pursue higher degrees in universities in the United Kingdom, Australia and other countries.

Career Prospects

Graduates of the programme can work as:

1. Quantity Surveyors
2. Construction Contract Managers
3. Construction Project Managers and other equal and relevant posts in the construction industry

Mode and Duration of Study

Mode of Study: Full-time.
Minimum Duration: 4 years
Maximum Duration: 6 years

Classification of Courses

Courses offered under this programme are based on the classification scheme shown in the table below:

Classification	Course Group	Credits	Total credit hours	Percentage
1. Programme Core	A. Construction Technology & Services	14	76	59
	B. Measurement & Documentation	15		
	C. Economics & Finance	13		
	D. Legal & Contractual Studies	9		
	E. Professional Practice	19		
	F. Research & Development	6		
2. Elective Courses	G. Elective Courses	32	32	25
3. General Courses	H. General Courses	20	20	16
		Total credit hours to graduate	128	100

Award Requirements

To be eligible to graduate from this programme, students must achieve a total of not less than 128 credit hours accumulated from courses that are set according to the classification scheme shown in the Classification of Courses section, with a minimum CGPA of 2.0.

List of Courses According To Semester

Semester 1

Course	Course Group[1]	Prerequisite	Credit	Total Credit
1. SBEQ1112 Construction Technology I	A		2	16
2. SBEQ1512 Professional Practice I	E		2	
3. SBEQ1812 Draughtsmanship[1] 4. SBEQ1822 Materials & Specifications[1] 5. SBEQ1832 Construction Mathematics[1] 6. SBEQ1842 Principles of Economics[1] 7. SBEQ1852 Introduction to Computer[1]	G		8	
8. UHAS1172 Dynamic Malaysia (Local) 9. UHAS1162 Arts, Custom & Beliefs (International)	H		2	
10. UICI1012 Islamic and Asia Civilisation	H		2	

Note: [1]Register only 4 courses from the 5 listed elective courses.

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ1122 Construction Technology II	A		2	17
2. SBEQ1213 Introduction to Construction Measurement	B		3	
3. SBEQ1313 Building Economics	C		3	
4. SBEQ1413 Principles of Law, Contract & Tort	D		3	
5. SBEQ1862 Principles of Management	E		2	
6. UHAS2122 Critical & Creative Thinking	H		2	
7. ULAB1112 English for Academic Communication	H		2	

Semester 3

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ2112 Construction Technology III	A		2	16
2. SBEQ2123 Building Services I	A		3	
3. SBEQ2213 Construction Measurement I	B	SBEQ1213	3	
4. SBEQ2312 Cost Estimating	C		2	
5. SBEQ2822 Financial Management	E		2	
6. SBEQ2812 Principles of Structures[1] 7. SBEQ2832 Construction Safety[1]	G		2	
8. UICI2022 Science, Technology and Mankind	H		2	

Note: [1]Register only 1 course from the 2 listed elective courses.

Semester 4

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ2133 Building Services II	A		3	17
2. SBEQ2223 Construction Measurement II	B	SBEQ1213	3	
3. SBEQ2322 Cost Planning & Control	C	SBEQ2312	2	
4. SBEQ2413 Construction Law & Contract I	D	SBEQ1413	3	
5. SBEQ2842 Engineering Survey[1] 6. SBEQ2852 Sustainable Construction[1]	G		2	
7. ULAB2112 Advanced English For Academic	H		2	
8. UHAS3102 Entrepreneurship & Enterprise Development	H		2	

Note: [1]Register only 1 course from the 2 listed elective courses.

Semester 5

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ3112 Construction Technology IV	A		2	17
2. SBEQ3213 Mechanical & Electrical Works Measurement	A	SBEQ1213	3	
3. SBEQ3513 Professional Practice II	E		3	
4. SBEQ3833 Construction Project Management	E		3	
5. SBEQ3813 Facilities Management[1] 6. SBEQ3823 Value Management[1]	G		3	
7. UHAS2032 Technocrat & Development 8. ULAM1112 Malay Language For Communication (Int'l)[2]	H		2	
9. UKQXXXXI Co Curriculum	H		1	

Note: [1]Register only 1 course from the 2 listed elective courses.
[2]Students are advised to enrol for the course in the earlier semester.

Semester 6

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ3528 Industrial Training	E	SBEQ3513	8	12
2. SBEQ3534 Industrial Training Reports	E	SBEQ3513	4	

Semester 7

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ4213 Project Documentation	B	SBEQ1213 SBEQ2213 SBEQ2223 SBEQ3213	3	16
2. SBEQ4312 Development Economics	C		2	
3. SBEQ4413 Construction Law & Contract II	D		3	
4. SBEQ4823 Construction Information Technology	E		3	
5. SBEQ4712 Research Method	F		2	
6. Free Elective[1]	G		2	
7. UKQXXX1 Co Curriculum	H		1	

Note: [1]Choose 1 course of 2 credits from the elective courses offered by the Department.

Semester 8

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ4843 Civil Engineering Works Measurement	B		3	17
2. SBEQ4324 Project Evaluation & Development	C	SBEQ4312	4	
3. SBEQ4512 Professional Practice III	E		2	
4. SBEQ4724 Undergraduate Project	F	SBEQ4712	4	
5. SBEQ4832 Fire Safety in Buildings[1`] 6. SBEQ4852 Land & Urban Economics[1] 7. SBEQ4862 Land Law[1]	G		2	
8. ULAB3122 English for Workplace Communication	H		2	

Note: [1]Register only 1 course from the 3 listed elective courses.

Programme Implementation

The programme is delivered using a variety of approaches, in general, the programme is realised based on the following approaches:

1. Lectures and Tutorials.
   Lectures comprise a discourse in which the lecturers provide the theoretical framework, principles and materials on the various subject matters and their application in practice. Visual aids will be used where appropriate. Students will be encouraged to ask questions and short discussions will be carried out within the context of the lectures.
   Tutorials are carried out to provide students with the opportunity to deepen their knowledge and understanding on the subject matter acquired during lectures. In tutorial periods, students will be able to identify problems among themselves or with their lecturers and tutors. Students will also work on questions or assignments either individually or in groups under the supervision of the lecturers or tutors.

2. Studios.
   Studios provide students with the means to improve their knowledge and understanding of the courses taught in lectures as well as to develop their skills ad competencies through the practical application of the theoretical knowledge on given problems or projects. Studio based courses are those under the measurement and documentation group. During studio sessions, the course

lecturers, in collaboration with lecturers of related courses will provide a simulated or real-life project for the students to work on. Students will be divided into groups of 10-15 students and a tutor will be assigned to each group. Studios are also aimed at developing students' ability to work in groups, communicate effectively and develop problem solving ability.

3. Laboratory and Field Works.
   Laboratory and field work will supplement the lecture materials of appropriate courses.

4. Problem Based Learning (PBL).
   Problem Based Learning is a very important component of teaching and learning process. PBL is implemented in a number of courses in this programme. This teaching and learning approach helps students to reinforce their understanding on the course contents.

5. Industrial Training.
   All third year students are required to undergo a fifteen-week Industrial Training at Quantity Surveying establishments of their choice. At the end of the training, students are required to submit an Industrial Training Report to the Department for assessment purposes.

6. Academic Visit.
   The programme will include visits to various organisations and sites related to the profession and the construction industry. In addition, students are also encouraged to have visits meant to develop their social and moral standings.

7. Final Year Project.
   A final year student is required to undertake a study in an area or specialised field of quantity surveying. The product of the study is an academic writing and an oral presentation. The academic writing must follow guidelines and format requirements set by the department and university. Each student is supervised by a lecturer throughout the study.

Student Academic Assessment

A variety of assessment methods are used to match the learning outcomes of programme and students learning styles.

1. Examinations, Tests and quizzes are valuable methods for assessing breadth of knowledge.

2. Written assignments are used to assess not only factual and theoretical knowledge but also the ability to solve problems and articulate an argument - key transferable skills. In the final semesters of the programme, a greater emphasis is placed upon the analysis, synthesis and evaluation of material.

3. Case study analyses and presentations to assess reasoning skills and ability to apply learned material to real-life situations.

4. Design projects, reports and work samples to assess competence in practical skills and techniques.

5. Poster and oral presentations, video production to assess communication and presentation skills.

6. Seminar papers and critical reviews to assess ability to analyse and synthesise information.

7. Project work assesses ability to work independently and collaboratively, search and critically review relevant literature and present findings in an academic manner in both written and verbal form.

8. Evidence based industrial training reports to document the students' performance in professional placement.

9. Online assessments, including self-tests quizzes and surveys.

Syllabus Synopses

The syllabus synopses below cover only the core and elective courses offered in this programme. Syllabus synopses for general courses are listed in the General Courses section. Students are encouraged to take courses offered in other programmes as free elective courses. However, students are advised to consult the head of programme before enrolling into any of these elective courses.

SBEQ1112 Construction Technology I

The aim of this course is to develop an understanding of construction technology and its application to the construction of low-rise domestic and commercial buildings not more than 5 storey. It will examine the processes and techniques related to the construction of substructures, frames, enclosure and finishes for low-rise domestic and commercial buildings. The course will also introduce students to Uniform Building by Laws (UBBL). The course will provide students with construction knowledge to be applied in other

courses such as estimating, measurement, construction planning and services. The course also provides avenue for students to develop their communication skills and the ability to work effectively as a team member to achieve mutual objective.

SBEQ1122 Construction Technology II

The aim of this course is to develop an understanding of construction technology and its application to the construction of medium span, low-rise commercial, industrial and community buildings. It will examine the processes and techniques related to the construction of substructures, frames, enclosure and finishes for medium span, low-rise commercial, industrial and community buildings. The course will provide students with construction knowledge to be applied in other courses such as estimating, measurement, construction planning and services. The course also provides avenue for students to develop their ability to communicate technical information graphically and to work effectively as a team member to achieve mutual objective.

SBEQ1213 Introduction to Construction Measurement

The aim of the course is to equip the students with the knowledge and skills of measurement and quantification of building works to complement the needs of the profession. This course introduces the concept and principles of measurement and quantification of building works and its relationship with costing and preparation of tender and contract documents. The course will focus on the application of the principles of measurement and introduction to quantification of simple building works. The course also provides the environment to develop students 'communication skills.

SBEQ1313 Building Economics

The aim of this course is to develop students' knowledge and understanding of the philosophy and concept of building economics in relation to costing and price analysis. The course covers the general aspects of building economics and factors influencing construction costs, different types of cost information such as cost data, cost model and cost index. This course will cover all aspects of cost management during pre-construction and construction stages of project development. The course also provides the environment to develop students' communication skills and the ability to work effectively as a team member to achieve common goal.

SBEQ1413 Principles of Law, Contract & Tort

The aim of this course is to provide students with the basic principles of law. The objectives are: one; to introduce the main principles of the Malaysian legal system, two; to elucidate certain specified principles

of the law of tort, agency and sale of goods relevant to construction works and three; to instil good understanding of the principles of the law of contract. This course is divided into five parts namely: The Malaysian legal system, law of tort, contract, agency and sale of goods. The course also provides the environment to develop students' ability to communicate ideas clearly and logically in spoken and written forms.

SBEQ1512 Professional Practice I

This course introduces students the overall quantity surveying programme and the programme outcomes, the nature of the construction industry, and the roles and responsibilities of the various professionals involved in the construction team. The course also highlights the relevant professional boards and institutions relating to quantity surveying practice. Topics covered include project development procedures, the building team, financial institutions, contractors and suppliers' organisations; professional boards and institutions; roles of quantity surveyors at pre and post contract stages, and professional ethics. The course also provides the environment to develop students' communication skills and the ability to work effectively as a team member to achieve mutual objective.

SBEQ1812 Draughtsmanship

The course is designed to provide students with the knowledge and skills to interpret and prepare construction drawings. The topics will include the fundamentals of technical drawing, including drawing and dimensioning practices, orthographic projections, isometric drawing and sketching, auxiliary and sectional views, and computer-aided drafting (CAD). At the end of the course, students will demonstrate their ability to interpret, explain, quantify and use working drawing. The course also provides the platform for students to develop their ability to communicate construction information visually and graphically.

SBEQ1822 Materials & Specifications

The overall aim of this course is to introduce students to the properties and behaviour of common materials used in the construction and method of drafting specification. It is intended to enable students to be conversant with the building materials and typical method of specification writing. This course will cover the details on construction materials including classification, sources, manufacturing process, tests involved and evaluation on appropriateness of construction materials. It includes aspects of concrete technology and soil mechanics. The course also provides the environment to develop students' ability to communicate work effectively as a team member to achieve mutual objective.

SBEQ1832 Construction Mathematics

Construction management and quantity surveying are technical disciplines which require the collection, processing and use of numerical data. It is therefore essential that students develop an acceptable understanding of the mathematical methods and techniques required for these key activities, and of how to apply them correctly. This course explores the rules for manipulation of formulae and equations, calculation of lengths, areas and volumes, determination of trigonometric and geometric properties, and the application of graphical and statistical techniques. Upon completion students will be able to select and apply appropriate mathematical techniques to address a wide variety of standard, practical, industry-related problems.

SBEQ1842 Principles of Economics

This course provides students with basic understanding on the economic principles and its application to the construction industry. It consists of basic micro and macroeconomic principles, demand & supply, market structure, national income, money and banking, fiscal policy and budget, business cycle and economic growth. The course also provides the environment to develop students' communication skills and the ability to work effectively as a team member to achieve mutual objective.

SBEQ1852 Introduction to Computer

This course is designed to provide an introduction to computers, programming and application softwares. Areas of study include IT policy and ethics, computer hardware, internet, problem solving and programming. It provide students with experience in using a range of computer software packages, and helps to develop skills in the choice and use of computing tools for various tasks. The course also enables students to seek information from a variety of sources.

SBEQ1862 Principles of Management

This course provides knowledge and develops understanding of the principles of management including the current changes and developments. It emphasises the elements of organisation, decision making, planning, leadership and motivation. It serves as a platform to develop students' skills and competencies in management. The course also provides the environment to develop student's ability to create good relationship, interact with colleague and work effectively with other people to achieve mutual objective.

SBEQ2112 Construction Technology III

The aim of this course is to develop an understanding of construction plants and machinery, method and techniques in demolition, renovation and repair works including the technology of industrialised and more advance construction. The course will provide students with skills to allow the evaluation of a range of technologies towards the adoption of an appropriate design decision and knowledge of the centrality of technological decision making in the context of the wider construction process. The course also provides the environment to develop students' communication skills and the ability to work effectively as a team member to achieve mutual objective.

SBEQ2123 Building Services I

The aim of this course is to provide knowledge and understanding of the building environment and the need for the various building services systems. This course will cover the common building services system and equipment within a building. It is intended to enable students to be conversant with the building services engineering and provide students with building services knowledge to be applied in other courses such as estimating, measurement and construction planning. The course also provides the platform to develop students' communication skills and the ability to work effectively as a team member to achieve mutual objective.

SBEQ2133 Building Services II

The aim of this course is to provide knowledge and understanding of the various building and infrastructure services. This course will cover the common building and infrastructure services system and equipments. It is intended to enable students to be conversant with the building and infrastructure services engineering and provide students with the knowledge to be applied in other courses such as estimating, measurement and construction planning. The course also provides the platform to develop students' communication skills and the ability to work effectively as a team member to achieve mutual objective.

SBEQ2213 Construction Measurement I (Prerequisite: SBEQ1213)

The aim of the course is to equip students with the knowledge and skills of measurement and quantification of building works to complement the needs of the profession. This course will further develop the knowledge, understanding and the skill of measurement of construction works according to SMM for Building Works for the purpose of preparation of bills of quantities and estimating. The course will focus on the application of the principles of measurement and quantification of low rise building works.

SBEQ2223 Construction Measurement II (Prerequisite: SBEQ1213)

The aim of the course is to equip students with the knowledge and skills of measurement and quantification of construction works to complement the needs of the profession. This course will further develop the knowledge, understanding and the skills of measurement of construction works according to SMM for Building Works for the purpose of preparation of bills of quantities and estimating. The course will focus on the application of the principles of measurement and quantification of construction works in high rise, large and more complex structures. The course also provides the platform to develop students' ability to communicate effectively in written form.

SBEQ2312 Cost Estimating

The aim of this course is to develop students' knowledge and understanding on the principles, techniques and systematic procedures of preparing cost estimates and building up rates. This course is designed to provide students with the knowledge and skills in preparing cost estimates for simple buildings and basic civil engineering works based on the various methods and techniques and to build up rates. By identifying the factors that influence the cost, the students will be able to determine the appropriate cost data and its sources to be applied in the estimates while enhancing the accuracy and reliability of these methods and techniques. The course also provides the platform to develop students' communication skills, the ability to work effectively as a team member to achieve mutual objective, and to seek information from various sources.

SBEQ2322 Cost Planning & Control (Prerequisite: SBEQ2312)

The aim of this course is to develop students' knowledge and understanding on the concepts and techniques of cost planning and control and their application in construction project development. This course is designed to provide students with the knowledge and skills in planning and controlling costs at various stages of project development. By outlining the costs, the students will be able to check and take necessary remedial action to comply with set targets, taking into consideration other external factors that might influence the probable costs. The concept of life cycle costing will also be introduced in order to enhance the techniques of cost planning and control. The course also provides the platform to develop students' communication skills and the ability to seek information from various sources.

SBEQ2413 Construction Law & Contract I (Prerequisite: SBEQ1413)

The aim of this course is to introduce to the students the important clauses in construction contract. The objectives are: one; to explain to the students the principles and the implications of the main terms of construction contract, two; to highlight the roles, duties and liabilities of the parties involved in the

construction contracts. The main standard forms of contract referred to in this course are those currently used locally and internationally. The course also provides the platform to develop students' communication skills and the ability to work effectively as a team member to achieve mutual objective.

SBEQ2812 Principles of Structures

This course is intended to encourage an appreciation of the structure of buildings and develop concepts of structural action, leading to an ability to model, analyse and design common elements and structural frames. The focus of this course is on understanding the forces in structures and the behaviour of some structural materials. Students will come to understand the forces which are created in the building framework and the structural elements, and be able to safely design simple structural units.

SBEQ2822 Financial Management

This course introduces students to the basics of financial management. It covers bookkeeping, balance sheet, profit and loss account, cash flow and funds flow, business control, measure of profitability, control of working capital, and control of fixed assets: costs, volumes, pricing and profit decision, budgets and sources of capital. The course also provides the platform to develop students' written communication skills and the ability to work effectively as a team member to achieve mutual objective.

SBEQ2832 Construction Safety

This course addresses issues, concepts, legislation and practice pertinent for effective construction health and safety management. It serves to develop critical understanding of the requirements and practice of construction safety management. The course also provides the platform to develop students' communication skills and the ability to work effectively as a team member to achieve mutual objective.

SBEQ2842 Engineering Survey

This course aims to introduce the concept and practical skills of land surveying in building construction projects. This course introduces students to the concept and practical skills of land surveying in building construction projects. It will emphasise on the layout and control of buildings, use and care of surveying instruments, directions, angles, surveying calculations, errors and computations of areas and volumes. At the end of the course, students will demonstrate their ability to set out building structures, earthwork and drainage works. The students should also be familiar with the methods of controlling the vertical alignment of buildings. The course also provides the platform to develop students' ability to work effectively as a team member to achieve mutual objective.

SBEQ2852 Sustainable Construction

This course explores the primary interfaces between the technologies of sustainable and high technology buildings. It will deal with current environmental and legislative issues with regard to the technological design and specification of contemporary and innovative buildings. In addition, students will examine the wider local and international perspectives on the concept of sustainable development and natural resource management. Site study visits will be undertaken to local sustainable and high technology buildings in occupation and under construction. The course also provides the platform to develop students' communication skills.

SBEQ3112 Construction Technology IV

The aim of this course is to develop an understanding of civil engineering structure and special construction. The course will provide students with skills to allow the evaluation of a range of technologies towards the adoption of an appropriate design decision and knowledge of the centrality of technological decision making in the context of the wider construction process. The course also provides the platform to develop students' communication skills and the ability to work effectively as a team member to achieve mutual objective.

SBEQ3213 Mechanical & Electrical Works Measurement (Pre requisite SBEQ1213)

The aim of the course is to equip the students with the knowledge and skills of measurement and quantification of building works to complement the need of the profession. This course will further develop the knowledge, understanding and the skills of measurement of mechanical and electrical (M&E) works according to SMM for Building Works for the purpose of preparation of bills of quantities and estimating. The course will focus on the application of the principles of measurement and quantification of mechanical and electrical (M&E) installation commonly found in buildings.

SBEQ3513 Professional Practice II

This course introduces students to the process and procedures at pre and post contract stage and develops their knowledge and understanding of the terms and conditions contain in standard forms of construction contract. It further enhances students' skills, competencies, and ethical and professional values in interpreting the terms and conditions into administrative process and procedures. The course consists of two main parts: part one relates to pre-contract processes that include tendering, documentation, procurement system and contract documents; part two covers works related to post contract administration. This course covers quantity surveying practices based on standard forms of contract currently applicable in Malaysian construction industry with more emphasis to the PWD and PAM

Standard Form of Contract. The course also provides the platform to develop students' communication skills.

SBEQ3528 Industrial Training (Prerequisite: SBEQ3513)

This course exposes the students to pre and post-contract practice and procedures of quantity surveying practices. Students will be attached to quantity surveying firms and government departments for a period of 24 weeks. At the end of the industrial training, students should be able to demonstrate the application of techniques, skills and tools in quantity surveying practices professionally and ethically and identify quantity surveying working procedures. Students should also be able to function effectively in a team, seek information and acquire contemporary knowledge, present information and express ideas clearly, effectively and confidently.

SBEQ3534 Industrial Training Reports (Prerequisite: SBEQ3513)

This course requires the students to produce a report on the industrial training carried out by them. The report will cover tasks undertaken and experiences gained by the students during their period of training at the respective firms or departments. After completing the report, the students should be able to present information and express ideas clearly, effectively and confidently.

SBEQ3813 Facilities Management

This course introduces the students to the various building components; understand the various basic systems and functions of building components and their integration with the building system, concept of facilities management and its application in various organizations in the construction industry. It covers the history, concept and principles of facilities management, the stages in undertaking facilities management, and financial, monitoring and controlling of facilities management. At the end of the course, the students should be able to describe the concept and principles of facilities management, and apply the knowledge of facilities management to the practice in the construction industry. The course also provides the platform to develop students' communication skills and the ability to work effectively as a team member to achieve mutual objective.

SBEQ3823 Value Management

This course introduces the students to the concept of value management and its application in the construction industry. It covers the history of value management, the concept and principles of value management, the concept of cost and significant items, the stages in undertaking value management, and the application of the function analysis system technique. At the end of the course, the students should

be able to describe the concept and principles of value management, and apply the knowledge of value management to the practice in the construction industry. The students should also be able to function effectively in a team, communicate effectively and demonstrate leadership skills.

SBEQ3833 Construction Project Management

This course prepares students with a comprehensive introduction to construction management techniques and tools. It not only aims at providing students with construction management concepts and skills, it also encourages students to put these concepts and skills into practice. Through the course, students are expected to improve their skills to manage their study and personal lives. In addition, students will be equipped with management competence and understanding of managerial ethics for their future career. The course also provides the platform to develop students' leadership skills and the ability to work effectively as a team member to achieve mutual objective.

SBEQ4213 Project Documentation (Prerequisite: SBEQ1213, SBEQ2213, SBEQ2223 & SBEQ3213)

The aim of the course is to expose the students to the real practice in preparation of tender document. This course will further provide students the exposure and experience in the process of preparation of a complete Tender Document for a specified construction project based on the current practice together with the priced tender document and project planning and financial control. The course will focus on the application of the principles of measurement and quantification of construction works in the preparation of a complete tender document for residential and medium rise commercial building. The course also provides the platform to develop students' communication and leadership skills, and the ability to work effectively as a team member to achieve mutual objective.

SBEQ4312 Development Economics

This course provides knowledge and understanding on the concept, elements and components of project development economics. It covers the relationship between the construction industry, property market and economic development, aspects of property development, investment appraisal and sources and types of development finance. At the end of the course, students should be able to describe the relationship between the construction industry, property market and the economy, property development process, identify the factors to be taken into consideration in development appraisal for different types of property, development control, prepare simple development appraisal using the residual and the cash flow method and identify the different types and sources of development finance. The course also provides the platform to develop students' communication skills.

SBEQ4324 Project Evaluation and Development (Prerequisite: SBEQ4312)

The ultimate aim of this course is to develop students' awareness and understanding of the problems associated with the management of building projects from inception through to commissioning, handover and beyond. This course will provide a premise for students to integrate and apply the other related courses studied in the previous semesters. Students will have the opportunity to explore problems of managing temporary organisations whose members are professionals in differing fields with differing objectives and perspectives on one project. Students should be able to seek information from a variety of sources, open to new ideas and have the capacity for self-directed learning, look for alternative ideas and solutions, present information and express ideas clearly, effectively and confidently and act ethically with integrity and social responsibility.

SBEQ4413 Construction Law & Contract II

This course introduces students to the various types of procurement systems and alternative dispute resolutions. The scope of this course encompasses local and international contracting. It covers relational and collaborative procurement systems and other conventional methods of procurement systems commonly adopted in building works. The course also provides the platform to develop students' communication skills.

SBEQ4512 Professional Practice III

This course introduces students to the roles, services and skills of the Quantity Surveying profession in the Construction Industry. It is designed to prepare the students to begin the process of professional qualification. The students will be exposed to the developing roles of the profession in the context of an evolving world construction industry and the marketing strategy adopted. The course also provides the platform to develop students' communication skills, and instil in students the need to act ethically with integrity and social responsibility.

SBEQ4712 Research Method

This course is designed to provide the knowledge and skills for students to undertake research work. It covers the process and techniques of research, research design, identification of research areas and the preparation of research proposal. At the end of the course, students should be able to identify issues, problems and areas of research, identify relevant data and information required for the research, develop data collection techniques, design research process and prepare research proposal. Students should be able to seek information from a variety of sources, open to new ideas and have the capacity for self-

directed learning, look for alternative ideas and solutions, present information and express ideas clearly, effectively and confidently and act ethically with integrity and social responsibility.

SBEQ4724 Undergraduate Project (Prerequisite: SBEQ4712)

This course is a continuation of Research Method (SBEQ 4712) and requires the students to undertake a dissertation project based on the research proposal that was prepared in Research Method. At the end of the course, the students should be able to undertake a literature review, identify data and information relevant to the research and its sources, collect data and information use the appropriate data collection techniques, analyse and synthesise data, draw findings from research undertaken and prepare a clear systematic dissertation report. Students should be able to seek information from a variety of sources, open to new ideas and have the capacity for self-directed learning, look for alternative ideas and solutions, present information and express ideas clearly, effectively and confidently and act ethically with integrity.

SBEQ4813 Construction Technology & Design

This course is intended to consolidate the knowledge gained in Principles of Structure and to extend this knowledge to the design and construction of multi-storey building structural systems. The emphasis is placed on the fundamentals of structural design and drafting, covering applications in reinforced concrete and steel construction. It also introduces students to the fundamentals of geotechnical engineering, which is essential in appreciating the relation of soil properties and implications to foundation choices and designs. Reference to appropriate codes and specifications, methods for selecting structural elements and foundations are studied and practiced. Relationship of structural framing and foundation plans, details and shop drawings to specific learning topics are also covered. The course also provides the platform to develop students' communication skills, and the ability to work effectively as a team member to achieve mutual objective.

SBEQ4823 Construction Information Technology

This course enhances student's knowledge and understanding the information technology application in the construction industry. The emphasis of the course is to enable the student to understand the importance of information and communication technology in construction industry. This course covers the use of information and communication technology in the construction industry, its development and its strategic implementation.

SBEQ4832 Fire Safety in Buildings

The aims of this subject is to provide knowledge and understanding of fire sciences, fire requirement, fire safety in buildings, fire risks analysis, and evacuation procedure in building fire. This subject covers the science, technology and analysis of fire safety aspects in low-rise and high-rise buildings, fire safety risks analysis techniques currently practice in fire safety engineering for non-residential and residential buildings. The course also provides the platform to develop students' communication skills, and the ability to work effectively as a team member to achieve mutual objective.

SBEQ4843 Civil Engineering Works Measurement

The aim of the course is to equip students with the knowledge and skill of measurement and quantification of civil engineering works to complement the needs of the profession. This course will further provide the knowledge, understanding and the skill of measurement of civil engineering works according to Malaysian Civil Engineering Standard Method of Measurement (CESMM) for the purpose of preparation of bills of quantities and estimating. The course will focus on the application of the principles of measurement and quantification of infrastructure and civil engineering works.

SBEQ4853 Land & Urban Economics

The aim of this course is to provide students with an understanding of the theoretical aspects of land and urban economics and development economics. This course will cover the economics of land, urban planning, housing and commercial property market; the concept of urbanisation and the theories of location, urban structure and urban growth. The course also provides the platform to develop students' communication skills, and ability to work effectively as a team member to achieve mutual objective.

SBEQ4862 Land Law

This course provides the students with the understanding and knowledge of the concepts and legal principles relating to land tenure and administration in Malaysia. It focuses on the concept and principles of land law, the compulsory acquisition of land by the government, the relationship between landlord and tenant, strata title, principles and procedures of conveyancing. The course also provides the platform to develop students' communication skills, and the ability to work effectively as a team member to achieve mutual objective.

Bachelor of Urban and Regional Planning

Introduction

The profession of urban and regional planning is concerned with the planning, designing and managing of the built environment. It is interdisciplinary in nature and integrates both the art and science of creating a better quality of life in a sustainable environment. At the local level the profession deals with the planning and designing of neighbourhoods, towns and cities. In contrast, the profession focuses on strategic and structural planning at the regional and national level. The profession seeks to balance between society and environment by managing developments through policies, strategies and plans.

The Urban and Regional Planning programme emphasises technical, strategic and generic skills demanded of planners. Students are instilled with knowledge on principles of planning, creativity in designing and problem solving, analytical and strategic thinking, and competency in research and practice.

Name of Award

Bachelor of Urban and Regional Planning [BURP]

Programme Philosophy

The programme focuses on the education and training of planners as outlined by the Act 538, Town Planners Act (1995), capable of performing the tasks as required by the Act 172, Town and Country Planning Act (1976) (and amendments made in 1995 and 2001). The programme is designed to graduate future urban planners with knowledge and skills on aspects of development, the environment, information technology, infrastructure, management as well as institution and law.

Programme Aim

The programme aims to produce competent graduates equipped with essential knowledge and skills for a professional career in urban and regional planning and various related fields.

Programme Education Objectives

Bachelor of Urban and Regional Planning has 5 programme educational objectives:

PEO1 Provide graduates with a range of learning experiences in acquiring relevant theories, methodologies, techniques and skills to develop a capacity for creative thinking and problem solving in urban and regional planning.

PEO2 Inculcate a culture of continual learning and innovation among graduates for a career in urban and regional planning in a dynamic economic, socio-cultural and environmental situations.

PEO3 Prepare graduates for diverse career opportunities in urban and regional planning and related fields at the local and global level.

PEO4 Instil awareness and sensitivity among graduates about the roles of urban and regional planning in achieving sustainable development.

PEO5 Offer quality planning education that fulfils the educational requirements of the Board of Town Planners Malaysia.

Programme Learning Outcomes

The intended learning outcomes of the Bachelor of Urban and Regional Planning programme are:

PO1 Discuss and articulate the philosophy, principles and institution of; and issues, problems and solutions in, urban and regional planning and other related fields.

PO2 Apply design tools, techniques, ICT and/ or create models to resolve planning problems and issues as well as communicate planning ideas.

PO3 Identify, analyse, evaluates and solve planning issues and problems; generate plans and formulate solution alternatives.

PO4 Convey ideas, express rationale and provide solutions clearly in verbal, graphic and written forms to different audiences.

PO5 Interact, collaborate and negotiate responsibly with etiquette among colleagues and/or community.

PO6 Demonstrate ethical, moral values and professionalism among peers and the community.

PO7 Select, retrieve, evaluate, and manage information from various sources, appreciate new ideas and be capable of independent learning.

PO8 Acquire basic management knowledge and skills as well as appreciate personal entrepreneurial characteristics.

PO9 Demonstrate the ability to initiate, lead, motivate and coordinate a team towards goal achievement.

Programme Accreditation

The programme is a professional course accredited by the Malaysian Public Services Department (JPA Malaysia) and the Board of Town Planners Malaysia (LPBM).

Career Prospects

Graduates of the programme have found employment opportunities widely in the public and private sectors as well as with non-governmental organisations (NGOs). In the public sector, the graduates are eligible to find employment as an urban planner with federal agencies such as Jabatan Perancangan Bandar dan Desa, Jabatan Kerajaan Tempatan, Jabatan Perumahan Negara, Jabatan Pengurusan Sisa Pepejal Negara, Jabatan Lanskap Negara and other local authorities. In the private sector, the graduates have the potential to work in urban planning consultancy firms, property developers and project management firms, and construction companies. Other opportunities for the graduates include teaching or working with NGOs focusing on the society and the environment.

Mode and Duration of Study

Mode of Study: Full-time.
Minimum Duration: 4 years
Maximum Duration: 6 years

Classification of Courses

Courses offered under this programme are based on the classification scheme shown in the table below:

Classification	Course Group	Credits	Total credit hours	Percentage
1. Core Courses	A. Studio	30	95	71
	B. Principal Courses	53		
	C. Industrial Training	12		
2. Elective Courses	D. Elective Courses	18	18	14
3. General Courses	E. General Courses	20	20	15
	Total credit hours to graduate		133	100

Award Requirements

To be eligible to graduate from this programme, students must complete a total of 133 credit hours or more, accumulated from courses set according to the classification scheme shown in the Classification of Courses section, with a minimum CGPA of 2.0.

List of Courses According To Semester

Semester 1

Course	Course Group[1]	Prerequisite	Credits	Total Credits
1. SBEP1115 Studio 1: Planning Awareness	A		5	16
2. SBEP1212 Introduction to Planning	B		2	
3. SBEP1223 Land Use Planning	B		3	
4. SBEP1312 Quantitative Techniques	B		2	
5. UICI1012 Islamic and Asian Civilisation	E		2	
6. UHAS1172 Dynamic Malaysia (local) 7. UHAS1162 Arts, Custom and Beliefs (International)	E		2	

Semester 2

Course	Course Group	Prerequisite	Credits	Total Credits
1. SBEP1125 Studio 2: Site Planning and Layout	A	SBEP1115	5	17
2. SBEP1323 Urban Engineering	B		3	
3. SBEP1512 Traffic Engineering	B		2	
4. SBEP1523 GIS in Planning	B		3	
5. UHAS2122 Critical and Creative Thinking	E		2	
6. ULAB1112 English for Academic Communication	E		2	

Semester 3

Course	Course Group	Prerequisite	Credits	Total Credits
1. SBEP2135 Studio 3: Area Improvement Study	A	SBEP1125	5	18
2. SBEP2413 Community Planning & Housing	B		3	
3. SBEP2612 Environmental Studies	B		2	
4. SBEP2813 Regional & Rural Planning	B		3	
5. SBEP2532 Spatial Analysis & Modelling[1]	D		2	
6. SBEP2572 Sustainable Transportation[1]				
7. SBEP2622 Introduction to Environmental Economics[1]				
8. SBEP2652 Tourism Planning 1[1]				
9. SBEP2722 Urban Appreciation Techniques[1]				
10. UICI2022 Science, Technology and Mankind	E		2	
11. UKQ*1xx1 Co-curriculum	E		1	

Note: [1] Choose 1 course (2 credits). Please refer to the Elective Course Groupings section.

Semester 4

Course	Course Group	Prerequisite	Credits	Total Credits
1. SBEP2145 Studio 4: Development Plan 1	A	SBEP2135	5	18
2. SBEP2333 Planning Techniques & Analysis	B		3	
3. SBEP2713 Urban Design	B		3	
4. SBEP2542 Spatial Statistics[1]	D	SBEP2532	2	
5. SBEP2662 Tourism Planning 2[1]				
6. SBEP2632 Environmental Planning & Management[1]				
7. SBEP2822 Rural Settlements[1]				
8. UHAS3102 Entrepreneurship and Enterprise Development	E		2	
9. ULAB2112 Advanced English for Academic Communication	E		2	
10. UKQ*1xx1 Co-curriculum	E		1	

Note: [1]Choose 1 course (2 credits). Please refer to the Elective Course Groupings section.

Semester 5

Course	Course Group	Prerequisite	Credits	Total Credits
1. SBEP3155 Studio 5: Development Plan 2	A	SBEP2145	5	17
2. SBEP3243 Planning Practice	B		3	
3. SBEP3263 Planning Legislation	B		3	
4. SBEP3422 Urban Economics	B		2	
5. SBEP2532 Spatial Analysis & Modelling[1]	D	SBEP2542	2	
6. SBEP2572 Sustainable Transportation[1]				
7. SBEP2622 Introduction to Environmental Economics[1]				
8. SBEP2652 Tourism Planning 1[1]				
9. SBEP2722 Urban Appreciation Techniques[1]				
10. SBEP3552 GIS Applications[1]				
11. SBEP3642 Environmental Planning Workshop[1]				
12. SBEP3672 Tourism Planning 3[1]				
13. SBEP3832 Rural Economic Development[1]				
14. UICI3032 Islam and Current Issues (Local) 15. ULAM1112 Malay Language for Communication (International)	E		2	

Note: [1]Choose 1 course (2 credits). Please refer to the Elective Course Groupings section.

Semester 6

Course	Course Group	Prerequisite	Credits	Total Credits
1. SBEP3278 Industrial Training	C	SBEP3155	8	12
2. SBEP3284 Industrial Training Report	C		4	

Semester 7

Course	Course Group	Prerequisite	Credits	Total Credits
1. SBEP4165 Studio 6: Project Planning	A	SBEP3155	5	18
2. SBEP4172 Undergraduate Project 1 (PSM 1)	B		2	
3. SBEP4432 Management & Governance	B		2	
4. SBEP4563 Transportation Planning	B		3	
5. SBEP2532 Spatial Analysis & Modelling[1]	D	SBEP2542	4	
6. SBEP2572 Sustainable Transportation[1]				
7. SBEP2622 Introduction to Environmental Economics[1]				
8. SBEP2652 Tourism Planning 1[1]				
9. SBEP2722 Urban Appreciation Techniques[1]				
10. SBEP3552 GIS Applications[1]				
11. SBEP3642 Environmental Planning Workshop[1]				
12. SBEP3672 Tourism Planning 3[1]				
13. SBEP3832 Rural Economic Development[1]				
14. SBEP4582 Traffic Impact Assessment[1]				
15. SBEP4732 Urban Conservation & Regeneration[1]				
16. SBEP4842 Rural Community & Culture[1]				
17. ULAB3142 Writing for Specific Purpose	E		2	

Note: [1] Choose 2 courses (4 credits). Please refer to the Elective Course Groupings section.

Semester 8

Course	Course Group	Prerequisite	Credits	Total Credits
1. SBEP4184 Undergraduate Project 2 (PSM 2)	B	SBEP4172	4	17
2. SBEP4253 Planning Theory	B		3	
3. SBEP4292 Comparative Planning	B		2	
4. SBEP2542 Spatial Statistics[1] 5. SBEP2662 Tourism Planning 2[1] 6. SBEP2632 Environmental Planning & Management[1] 7. SBEP2822 Rural Settlements[1] 8. SBEP4592 Transportation Analysis[1] 9. SBEP4742 Sustainable & Livable City Design[1]	D	SBEP2532	4	
10. Free Elective[2]	D		2	
11. Free Elective[3]	D		2	

Note: [1] Choose 2 courses (4 credits). Please refer to the Elective Course Groupings section.
[2] Choose 1 course of 2 credits from other department or faculty or from the electives above.
[3] Choose 1 course of 2 credits from other department or faculty or from the electives above.

Elective Course Groupings

Following are the recommended groupings of elective courses according to specialisation:

Specialisation	Elective Courses
Urban Design	SBEP2722 Urban Appreciation Techniques SBEP4732 Urban Conservation & Regeneration SBEP4742 Sustainable & Livable City Design
Tourism Planning	SBEP2652 Tourism Planning 1 SBEP2662 Tourism Planning 2 SBEP3672 Tourism Planning 3

Specialisation	Elective Courses
Environmental Planning	SBEP2622 Introduction to Environmental Economics SBEP2632 Environmental Planning & Management SBEP3642 Environmental Planning Workshop
GIS Technology	SBEP2532 Spatial Analysis & Modelling SBEP2542 Spatial Statistics SBEP3552 GIS Applications
Transportation Planning	SBEP2572 Sustainable Transportation SBEP4582 Traffic Impact Assessment SBEP4592 Transportation Analysis
Rural Planning and Development	SBEP2822 Rural Settlements SBEP3832 Rural Economic Development SBEP4842 Rural Community & Culture

To specialise in an area of planning, students are advised to complete in sequence all the courses in that particular specialisation.

Programme Implementation

Courses are designed on the principle of student-centred learning where the focus is on how the students learn. Therefore, the concept of Student Learning Time (SLT) is adopted by the programme whereby each 1 credit hour is equivalent to 40 hours of learning by the students. Learning here means formal learning such as lectures and tutorials as well as informal learning done by the students such as revision, doing homework, etc. Thus a typical course of 3 credits would expect an SLT of 120 hours.

The formal learning includes a variety of approaches depending on the nature of the courses. The approaches are:

1. Lectures and Tutorials
   Lectures and, for some courses, tutorials too are the primary means of teaching and learning. The lectures and tutorials are conducted both in classes and in the field for allocated hours per week, depending on the course credits.

2. Studios
   Studio is an essential part of the programme. Its importance is reflected in the ten hours per week allocated for each studio. Through studio work, students learn hands-on how to resolve real urban planning problems. Through team working and under supervision of the studio stupervisors, the students learn to implement the planning, the strategy, the techniques, the design and the creativity required for solving real case studies.

3. Laboratory and Field Works
   Certain courses require the students to undergo certain hours of laboratory works or go on field work off campus.

4. Problem-Based Learning (PBL)
   Problem-Based Learning is a very important component of teaching and learning process. PBL is implemented in a number of courses in this programme. This teaching and learning approach helps students to reinforce their understanding of the course contents.

5. Industrial training
   The industrial training aims at developing the skills, knowledge and attitudes needed to be a professional planner. The objective is to strengthen the understanding of the theoretical principles, technical and design skills through practical experience. All third year students are required to undergo a 24-weeks industrial training at an urban planning agency of their choice. At the end of the training, students are required to submit an Industrial Training Report to the department for assessment purposes.

6. Final Year Project
   The Final Year Project or The Undergraduate Project is an academic exercise to train students how to carry out research independently under the guidance of his/her project supervisor. The students will carry out a project in which they learn the basics of research, vis-à-vis the formulation of research problem, literature search and review, formulation of research design and methodology, determination of samples, data collection, data processing, data analysis and interpretation, the norms and style of academic writing; and the presentation and defence of research.

Student Academic Assessment

A variety of assessment methods are used to match the learning outcomes of the programme and students learning styles.

1. Examinations, tests and quizzes are valuable methods for assessing breadth of knowledge.

2. Written assignments are used to assess not only factual and theoretical knowledge but also the ability to solve problems and articulate an argument - key transferable skills. In the final semesters of the programme, a greater emphasis is placed upon the analysis, synthesis and evaluation of material.

3. Case study analyses and presentations to assess reasoning skills and ability to apply learned material to real-life situations.

4. Design projects, reports and work samples to assess competence in practical skills and techniques.

5. Poster and oral presentations to assess communication and presentation skills.

6. Project work assesses ability to work independently and collaboratively, search and critically review relevant literature and to present findings in an academic manner in both written and verbal form.

7. Evidence-based industrial training reports which document the students' performance in professional placement.

8. Online assessments, including self-tests quizzes and surveys.

Syllabus Synopses

The syllabus synopses below cover only the core and elective courses offered in this programme. Syllabus synopses for general courses are listed in the General Courses section. Students are encouraged to take courses offered in other programmes as free elective courses. However, students are advised to consult the head of programme before enrolling into any of these elective courses.

SBEP1115 Studio 1: Planning Awareness

This course aims at introducing students to the fundamental relationship between humans and the built environment as well as between various urban elements, amenities and the achievement of urban quality, the understanding of which is the cornerstone to any effort towards good urban planning and design. The studio focuses on training students in various skills of sensing, perceiving, experiencing and appreciating

the built environment and the urban society who build and use it, as well as the ability to confidently and effectively communicate their views and opinions in graphic, written and verbal modes.

SBEP1125 Studio 2: Site Planning and Layout (Prerequisite: SBEP1115)

The course is designed to impart skills on the preparation of layout plans. The contents include an understanding of the basic principles of site planning and analysis; the use of planning standards and regulations; approaches and processes for the preparation of concept plans and design; the elements and principles of layout design; techniques of information display and presentation; and preparation of a brief report on the layout plan. Students are required to work in groups at the early stages of the studio, and individually at the detailed design and report writing stage. Layout plan preparation is for a residential development covering an area of about 20 hectares.

SBEP1212 Introduction to Planning

The course introduces to students the history and theory of town planning. It includes the definition and perspectives of town planning; town planning history and its evolution in Europe and other parts of the world from the pre-historic era to the 21st century; evolution of town planning theories and approaches; town planning history and development in Malaysia; and current challenges in town planning.

SBEP1223 Land Use Planning

The course aims to introduce to students knowledge on urban land development and land use planning towards creating an efficient and functional urban area that meets the socioeconomic needs and enhances the living environment of its citizens. The course content covers theories, concepts and principles of urban growth and planning of the urban land use; the land use planning control mechanisms; the urban land use planning process; and the concept of planning for public interest.

SBEP1312 Quantitative Techniques

The aim of the course is to equip students with knowledge and skills to analyse quantitative and qualitative data obtained from planning surveys. The course covers sampling design, hypothesis testing, analysis of variance, measure of association and simple linear regression.

SBEP1323 Urban Engineering

The course provides students with an introduction to various urban engineering elements and their roles in urban planning. The elements include roads, water supply, drainage, sewage treatment, solid waste management, electricity distribution, gas distribution, and communication infrastructure.

SBEP1512 Traffic Engineering

This course aims to provide students with knowledge and skills to perform transportation data collection and traffic analysis. The course covers traffic volume study, spot speed study, intersection analysis, road capacity and level of service, Highway Capacity Manual, parking study, access management and traffic calming.

SBEP1523 GIS in Planning

The course is offered to expose students to information technology in planning. It comprises of two (2) parts: Part 1 deals with the basics of GIS: the introduction, philosophy, concept and skills of using GIS. Part 2 deals with the implementation of GIS, especially in the urban and regional planning field.

SBEP2135 Studio 3: Area Improvement Study (Prerequisite: SBEP1125)

This studio deals with the preparation of Report of Survey for small area planning. It involves preparing and carrying out the various surveys required in a planning study. The process will include preparation of checklist, schedule, base maps and questionnaires. Students will conduct survey; data processing and analysis; and prepare report of survey to include preliminary recommendations.

SBEP2145 Studio 4: Development Plan 1 (Prerequisite: SBEP2135)

This studio focuses on the preparation of technical reports for a development plan either a Structure Plan or a Local Plan. Depending on the type of development plan, the sectoral components may include but not limited to - regional framework, socioeconomic and demography, land use and physical, commercial and industry, landscape and recreational, housing and community facilities, town centre and urban design, infrastructure and utilities, transportation, and institutional framework and implementation.

SBEP2333 Planning Techniques and Analysis

The course aims to equip students with fundamental knowledge and computation skills in the techniques of plan making, analysis and evaluation so as to perform and apply the analysis and evaluation techniques to satisfy the needs of the urban and regional planning process. The course will go through in

detail the theory, concept, mechanism and the working and calculations involved in each of the techniques and analysis methods commonly used in the urban and regional planning process.

SBEP2413 Community Planning and Housing

The course deals with aspects of housing and social and community planning. The first part is designed to equip students with knowledge of the housing market, the complexities of housing problems and the meaning of housing to individuals and the community. The second part is designed to equip students with knowledge of social theories, approaches and models of community planning and development.

SBEP2532 Spatial Analysis and Modelling

The aim of this course is to provide exposure and training in using various methods of spatial analysis in GIS environment. The course introduces several types of spatial analysis and their modelling processes. It also allows the student to familiarise with the concept of spatial decision support system and multi-criteria decision making processes. In essence, it provides a basic understanding in the advanced application of GIS in planning and management.

SBEP2542 Spatial Statistics (Prerequisite: SBEP2532)

This course deals with the application of Geographic Information System in social science. The emphasis is placed on the visualisation and statistical analysis of spatial data for characterising social and environmental systems. Applications and evaluation of spatial analytical and statistical methods related to urban and regional planning are the focus of the course.

SBEP2572 Sustainable Transportation

Transportation, if not planned and managed properly, can bring adverse impacts to the economy, society and the environment. This course highlights these issues and evaluates the impacts of transportation. During the course, students will identify how urban forms may influence the shape of transportation systems and network. Different modes of transportation will be presented to the students and their role towards sustainable transportation is evaluated.

SBEP2612 Environmental Studies

The aim of the course is to introduce students to the principles of the environment and the application of these principles to mitigate the impact of human development on the environment. The first part focuses on the basic principles of the environment and its ecosystems, and the second part discusses current

environmental issues arising from urbanisation and population growth. The final part offers different concepts and techniques used in environmental planning and management either to mitigate or altogether avoid the environmental problems.

SBEP2622 Introduction to Environmental Economics

The course covers a review of the basic principles of market economics plus the reasons for their failure in handling environmental resources; economic instruments used in environmental policies; economic valuation of environmental resources and current global environmental economic issues.

SBEP2632 Environmental Planning and Management

The aim of the course is to develop students' knowledge on fundamental concepts and mechanisms underlying environmental planning and management. It focuses on the understanding of the functions of ecosystems, the impacts of land development activities on such ecosystems, and the appropriate tools/techniques of environmental planning and management that are used to mitigate the impacts.

SBEP2652 Tourism Planning 1

The aim of the course is to provide students with an introduction to general principles and components of tourism planning. The course discusses relationship that exists between tourism, society and the environment. This will enable the students to appreciate and understand the concept of tourism development in urban and rural areas by applying inventory and evaluation techniques of tourism resources for development planning. Students will be exposed to the practical aspect through a project as an essential part of the learning process.

SBEP2662 Tourism Planning 2

The course discusses how the tourism industry markets physical environments, thus, 'push' and 'pull' factors that give rise to the need to manage tourism development that is often not seriously considered by town (or urban) and regional planner. The course covers the whole spectrum of urban and regional environment related to the principles of sustainable development and sustainable tourism.

SBEP2713 Urban Design

The course aims to introduce students to the background of urban design and its relationship with urban planning. It highlights current urbanism issues in order to illustrate the indispensable role of urban design in managing the city's physical characteristics. The urban design process involves various approaches

and students are exposed to aspects such as techniques for evaluating visual quality of the urban environment; design criteria for promoting an imaginable, safe and attractive city employing current techniques and ideas; urban conservation and development control through the use of urban design guidelines.

SBEP2722 Urban Appreciation Techniques

This course provides students interested in specialising in Urban Design with basic training in techniques of inquiry into problems and issues relating to the use of the urban public realm (urban spaces and public places). It points to the importance of urban spatial perception and appreciation skills among urban and regional planners in identifying and understanding more accurately urban public realm problems and issues as well as the 'spirit of place' within specific urban, spatio-functional and socio-cultural contexts. Depending on the nature of the problems/issues facing the study area selected (e.g. part of a city centre, a small town/neighbourhood centre, a main street, part of an urban neighbourhood, an historical quarter etc.), students will apply appropriate techniques of inquiry to the analysis of the area and present their analytical appraisal and findings for the area in an illustrative report and presentation panels.

SBEP2813 Regional and Rural Planning

This course introduces students to the philosophy, theory and practices of regional and rural planning. It focuses on basic understanding of the substantive and procedural knowledge of regional and rural planning and examine the practices of regional and rural planning in Malaysia and a few selected countries in Europe and Asia.

SBEP2822 Rural Settlements

The course aims to expose students to rural settlement systems and patterns. It will emphasise the concepts, theory, and development practices of rural settlement centres in Malaysia, particularly the characteristics of traditional villages, new villages (Chinese), and FELDA settlements. In addition, the contribution of functions, land use, infrastructure and services, hierarchy and prospects of the rural service centre in development will also be discussed. At the end of the course, students should be able to analyse rural settlement characteristics for one mukim, or combination of several mukims.

SBEP3155 Studio 5: Development Plan 2 (Prerequisite: SBEP2145)

This course involves the conception of a development plan and charting appropriate strategies to achieve its stated goal and objectives. It provides for the application of planning and design principles for generating the optimum plan solutions. From the physical planning standpoint, the proposed

development plan serves as a developmental roadmap for the planned period, aimed at guiding decision makes, city planners, designers and builders in carrying development activities consistent with the overall plan aspiration.

SBEP3243 Planning Practice

The course exposes students to the practices of town planning from the perspective of public and private agencies. Among the key aspects include the philosophy/ideologies, the system (legislations, institutions, tools used in approval processes, and the organisational set-up), and the conduct of professional code of ethics.

SBEP3263 Planning Legislation

The course introduces the legal framework for development planning and control. It includes the historical background of urban planning law, the components of the Planning Act namely the statutory organisations, development plans, development control, enforcement, planning appeals and other planning tools. It also covers other related laws relevant to urban and regional planning such as the National Land Code, Uniform Building by-laws, and Environmental Quality Act.

SBEP3278 Industrial Training (Prerequisite: SBEP3155)

The aim of industrial training is to expose students to real working environment and develop the necessary skills for the job market. The Industrial Training is oriented towards developing the skills, knowledge and attitudes needed to be a professional planner. The objective is to strengthen the understanding of the theoretical principles, technical and design skills through practical experience. Students will be placed at agencies of their choice for twenty four (24) weeks. At the end of the training, students will have to submit an industrial training report. Students will be assessed by both the agency supervisor and a visiting supervisor. Students have to pass the assessments of both supervisors as a condition for completion of the course.

SBEP3284 Industrial Training Report

An industrial training report has to be prepared by each student at the end of their industrial training. The report will contain background on the agency and their range of services; summaries of each tasks undertaken by the students during the training; comments on lessons learnt and experiences gained; self reflection of their readiness to face working life; self assessment of their employability; and feedbacks on the urban and regional planning programme as a whole. The report will also include samples of work

done during the training. The report will be graded and students need to obtain a pass as condition for completion of industrial training.

SBEP3422 Urban Economics

The aim of the course is to introduce students of urban planning to urban economics and development. The course content will cover urban growth models, the development process, property value and valuation, property market and the economy, basic market research concepts, project development cycle and aspects of appraisal.

SBEP3552 GIS Applications (Prerequisite: SBEP2542)

GIS applications workshop is an experiential course to provide students with the opportunity to apply GIS to real-world planning and management issues. The course will introduce students to GIS applications and implementation on various levels of urban and regional planning and management. In this course, GIS strategy will be interpreted with some understanding of issues in GIS application and implementation.

SBEP3642 Environmental Planning Workshop

Environmental Planning Workshop (EPW) is an experiential course to provide students with the opportunity to address real-world environmental planning and management issues. Under the direction of a faculty member(s), students work in a team to develop proposals, conduct survey/research, analyse and evaluate alternatives, and make recommendations for possible solutions to some given environmental planning/management problems. While the environmental issues to be dealt with may vary each semester depending on the opportunity presented at the time of the workshop, the principles and methodologies involved in conducting the workshop remain the same. The range of environmental planning and management issues within the scope of this workshop include, but not limited to, watershed planning, water resources planning, low impact development (LID), urban streams restoration, natural hazards, environmental inventory and environmental spatial analysis.

SBEP3672 Tourism Planning 3

The course discusses tourism planning as a process that involves an interdisciplinary approach aimed at creating vibrant, attractive, economically viable, socially responsible and environmentally sustainable urban tourism industries. The course also covers the understanding that tourism planning should also be integrated into the overall planning approach/system/process, the needs for forecasting demand and assessing socio-cultural effects (or demonstration effects). Students will be exposed to the practical aspect through a project as an essential part of the learning process.

SBEP3832 Rural Economic Development

This course examines the theory and principles of rural economic development; analyses trends and outlook of the rural economy according to sectors; discusses issues and prospects of Malaysia's rural economy; appraise the rural economic development strategy and its impact. Students will also be exposed to case studies of economic analysis in a rural region and how economic strategies were articulated in spatial planning.

SBEP4165 Studio 6: Project Planning (Prerequisite: SBEP3155)

The studio project is designed to equip town planning students with the knowledge and ability to deal with a property development of a large township. The exercise is comprehensive, ranging from land matters, statutory requirements, policies and procedures, site appraisals, site design, appraisal on property market trends and preparation of submission documents for Planning Approvals.

SBEP4172 Undergraduate Project 1

The course is designed to equip students with the basic knowledge of the concepts, principles and techniques in research, vis-à-vis the formulation of research problem, literature search and review, formulation of research design and methodology, determination of samples, data collection, data processing, data analysis and interpretation, the norms and style of academic writing; and the presentation and defence of research. The course require students to prepare the first and second chapters of the dissertation and the research instrument.

SBEP4184 Undergraduate Project 2

This course is a continuation of Undergraduate Project 1 and is a prerequisite for Undergraduate Project 2. It requires students to complete the dissertation project. It will involve the data analysis, findings, conclusion and writing of the dissertation. Students will present their dissertation project at the end of the course to a panel.

SBEP4253 Planning Theory

The course provides critical assessment of core urban planning theories. It covers the typology, evolution of planning theories and critical assessment on the systems approach in planning, the choice theory of planning, advocacy planning, implementation theories, citizen participation, collaborative participation, communicative planning and Islamic town planning; and their application in practice.

SBEP4292 Comparative Planning

Systems of planning differ by geopolitical regions. This course attempts to expose students to the various planning systems as practised in different countries, thus allowing students to widen their perspectives of town planning; to compare and learn from other people's experiences in various social, cultural, economic situations.

SBEP4432 Management and Governance

The aim of the course is to develop students' knowledge and skills concerning management and governance. It discusses aspects of management covering management functions, levels and skills, self development and conflict management. It also covers governance in the public and corporate sector and the relationship between governance and urban planning policy. The course concludes by examining corruption and governance. The course require students to work in teams on a given task.

SBEP4563 Transportation Planning

The course introduces students to transportation planning and equips them with knowledge on techniques and models to address urban transportation problems. It covers urban transportation issues, land use and transport relationship, traffic management, process of transportation planning and urban transportation models.

SBEP4582 Traffic Impact Assessment

New developments create new trips. These new trips will adversely affect the current traffic conditions on existing road network. To mitigate these negative impacts, a systematic analysis must be performed on the proposed new development to ascertain the extent of the traffic problems created. Only then a specific mitigation plan that seeks to alleviate the traffic problems can be formulated. This course will attempt to provide the whole gamut of the preparation of a Traffic Impact Assessment report and along the way teach students various traffic analysis methods required to prepare the report.

SBEP4592 Transportation Analysis

There are many problems associated directly or indirectly with transportation and land use. This course attempts to provide in-depth understanding of a transportation problem which students are required to select at the beginning of the semester and work their way till the end of the semester. The causes, symptoms and consequences of the problems will be analysed in detail from data collected on site and

literature reviews. A critical analysis of current policies related to the problem allow the students to assess if local authorities are actually solving the problems or otherwise.

SBEP4732 Urban Conservation and Regeneration

This course provides students who specialise in Urban Design with more advanced knowledge and training in planning and design skills related to urban conservation and urban regeneration/revitalisation. Urban conservation and regeneration/ revitalisation are becoming increasingly important as cities the world over seek to simultaneously improve their economic competitiveness, ecological sustainability, social vitality and livability while enhancing their historic and cultural characters and identity. An existing urban area (e.g. a city/town's historic core, an inner urban neighbourhood, a by-passed town centre, a disused industrial site, or a place of socio-cultural significance etc.) will be selected where students attempt to identify design issues of and explore design strategies for conserving, regenerating, revitalising and/or other forms of intervention appropriate to the area and its context. These will be clearly articulated through an illustrative report as well as several presentation panels.

SBEP4742 Sustainable and Livable City Design

The final Urban Design specialisation course aims at exposing students to the latest ideas, initiatives, concepts, principles and approaches in urban planning and design towards building more sustainable and livable cities. Students are required to perform critical interpretation of concepts and principles of the sustainable and livable city; New Urbanism; transit oriented development (TOD); Livable Neighbourhoods; mixed use development (MXD); compact and walkable cities; Smart Growth; Sustainable Urban Extensions (SUE); Zero Emission Development (ZED); Low Carbon Society (LCS); Low Impact Development (LID) and/or other emerging ideas, and attempt to apply/adapt the concepts and principles to improving the sustainability and livability of a selected urban area. These will be clearly presented in an illustrative report as well as a set of presentation panels.

SBEP4842 Rural Community and Culture

This course will introduce the diverse range of communities, landscape, and cultural tradition that constitute rural Malaysia. The socio-cultural, economic, physical, values and belief systems of the people and communities in rural Malaysia varies such as the Malays in traditional villages, Chinese in small towns, Indians in estates, the indigenous people of Sabah and Sarawak, the remote communities of Orang Asli and Orang Ulu. This course will also explore how these diverse problems and potentials, needs and inspirations should be addressed by planners.

Bachelor of Landscape Architecture

Introduction

The programme is designed and implemented since 1993 which was inspired on the core understanding of Man as the steward of the Earth and based on the design and built philosophy. It aims to produce professionals who are competent and technically knowledgeable, critical and creative in problem solving on issues pertaining to aspects of heritage, tropical, urban and natural resources.

Landscape architecture combines both art and science. It is a profession that involves the design, planning and management of exterior spaces through the use of land and water elements in creating outdoor spaces which are practical and aesthetically pleasant. The work of a landscape architect does not only add value but provide comfortable outdoor environment in residential areas, work and play spaces. Landscape architecture is a discipline that covers a diverse scope ranging from the design of exterior landscapes within urban, rural, communal, ecological and regional areas. Landscape architects serve not only as designers but help to create landscape that responds to human habitation in diverse cultural and ecological contexts.

Name of Award

Bachelor of Landscape Architecture [BLA]

Philosophy

The philosophy is primarily based on the landscape architectural design and built pedagogy which parallels the needs and aspiration of the industry, society and the nation.

Aim

To educate and produce graduates in landscape architecture who are able to plan, design and manage landscape works.

Programme Educational Objectives

The undergraduate programme in Bachelor of Landscape Architecture is designed to produce graduates who will be:

PEO1 Qualified and competent in solving design and project related problems, logically, creatively and analytically based on sound facts and ideas.

PEO2 Capable to demonstrate mastery in communication skills and other relevant soft skills.

PEO3 Substantially competent in analysing and integrating the natural systems with social and communal needs.

PEO4 Capable of meeting the challenges of the landscape architectural environment with professional integrity and pursue life-long learning; and proficient in entrepreneurship skills and global domain.

Programme Learning Outcomes

The intended learning outcomes of the Bachelor of Landscape Architecture programme are:

PO1 Comprehend knowledge related to environmental aspects, technology, culture, design and theory into landscape architectural projects.

PO2 Comprehend and apply appropriate and practical technological knowledge and theories into landscape architectural projects.

PO3 Critically evaluate, plan, organise, direct and control landscape architectural management resources i.e. manpower, money, materials and machineries.

PO4 Communicate effectively landscape architectural aspects via visual and verbal techniques including ICT to a given audience.

PO5 Communicate effectively and work collaboratively as a team with clients, allied professionals and community while undertaking a range of different team roles.

PO6 Independently acquire and understand landscape architectural knowledge.

PO7 Showing professional commitment and personal integrity in the service of landscape architecture practices that comply with the code of ethics and behaviour.

PO8 Demonstrate the ability of entrepreneurial and management skills including resourcefulness.

PO9 Show proactive and astute leadership skills in an organization.

Accreditation

The Bachelor of Landscape Architecture degree was introduced to Universiti Teknologi Malaysia during 1993/1994 session. The programme offers students with diplomas in any of the following background; architecture, town and regional planning, landscape design, agriculture and forestry from Malaysian institutions of higher learning or its equivalent to study for the degree. It also includes students from Matriculation and Higher School Certificate programmes. Graduates of Bachelor of Landscape Architecture from UTM are eligible to register as graduate members with the Institute of Landscape Architecture Malaysia (ILAM) the Malaysian professional body of landscape architects.

Career Prospects

Graduates of the programme can work as:

1. Landscape architects
2. Officer Researchers at research institutions, universities and industries
3. Academicians at universities, polytechnics and colleges
4. Graphic illustrators and designers
5. Nursery operators
6. Landscape contractors
7. Landscape managers

Mode and Duration of Study

Mode of Study: Full-time
Minimum Duration: 4 years
Maximum Duration: 6 years

Classification of Courses

Courses offered under this programme are based on the classification scheme shown in the table below:

Classification	Course Group	Credits	Total credit hours	Percentage
1. Programme Core	A. Design	47	78	60
	B. Integrated Technology	19		
	C. Man & Environment	12		
2. Elective Courses	D. Elective Courses	33	33	25
3. General Courses	E. General Courses	20	20	15
	Total credit hours to graduate		131	100

Award Requirements

To graduate, students must achieve a total of not less than 131 credit hours accumulated from courses that are set according to the classification scheme shown in the Classification of Courses section, with a minimum CGPA of 2.0.

List of Courses According To Semester

Semester 1

Course	Course Group[1]	Prerequisite	Credit	Total Credit
1. SBEL1404 Basic Design	A		4	18
2. SBEL1492 Landscape Construction 1	B		2	
3. SBEL1532 Horticulture & Nursery	C		2	
4. SBEL1582 History of Landscape Architecture	C		2	
5. Elective[1]	D		2	
6. Elective[1]	D		2	
7. UHAS1172 Malaysian Dynamics (Local) 8. UHAS1162 Arts, Customs and Beliefs of Malaysian (Int'l)	E		2	
9. UICI1012 Islamic and Asian Civilisation	E		2	

Note: [2]Elective courses to be advised by academic advisor (Please refer to the Elective Courses section).

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEL1414 Community Landscape Design	A	SBEL1404	4	18
2. SBEL1542 Ornamental & Natural Plant Materials	C	SBEL1532	2	
3. SBEL1592 Environmental Psychology & Socio-Culture	C		2	
4. Elective[1]	D		2	
5. Elective[1]	D		2	
6. Elective[1]	D		2	
7. UHAS2122 Critical and Creative Thinking	E		2	
8. ULAB1112 English For Academic Communication	E		2	

Note: [1] Elective courses to be advised by academic advisor (Please refer to the Elective Courses section)

Semester 3

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEL2425 Recreation and Park Design	A	SBEL1414	5	18
2. SBEL2502 Landscape Construction 2	B	SBEL1492	2	
3. SBEL2562 Planting Technology	B	SBEL1542	2	
4. SBEL2552 Ethnobotany Plant Materials	C	SBEL1542	2	
5. Elective[1]	D		2	
6. Elective[1]	D		2	
7. UICI2022 Science, Technology and Mankind	E		2	
8. UKQX1xx1 Co-curriculum I	E		1	

Note: [1] Elective courses to be advised by academic advisor (Please refer to the Elective Courses section)

Semester 4

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEL2435 Urban Landscape Design	A	SBEL2425	5	16
2. SBEL2602 Heritage Landscape & Conservation	C		2	
3. SBEL2612 Professional Practice 1	C		2	
4. Elective[1]	D		2	
5. Elective[1]	D		2	
6. ULAB2122 Advanced English for Academic Communication	E		2	
7. UKQX1xx1 Co curriculum II	E		1	

Note: [1] Elective courses to be advised by academic advisor (Please refer to the Elective Courses section)

Semester 5

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEL3445 Landscape Resource Planning	A	SBEL2435	5	17
2. SBEL3512 Landscape Construction 3	B	SBEL2502	2	
3. SBEL3572 Planting Technology 2	B	SBEL2562	2	
4. SBEL3622 Professional Practice 2	C	SBEL2612	2	
5. Elective[1]	D		2	
6. Elective[1]	D		2	
7. UHAS2032 Technocrat & Development (Local) 8. ULAM1112 Malay Language for Communication (International)	E		2	

Note: [1] Elective courses to be advised by academic advisor (Please refer to the Elective Courses section)

Semester 6

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEL3458 Industrial Training 1	A	SBEL3445	8	12
2. SBEL3464 Industrial Training 2	A	SBEL3445	4	

Semester 7

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEL4476 Topical Studies	A	SBEL3458 SBEL3464	6	16
2. SBEL4523 Landscape Construction 4	B	SBEL3512	3	
3. Elective[1]	D		3	
4. Elective[1]	D		2	
5. ULAB3142 Writing For Specific Purpose	E		2	

Note: [1] Elective courses to be advised by academic advisor (Please refer to the Elective Courses section)

Semester 8

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEL4486 Final Comprehensive Project	A	SBEL4476	6	16
2. SBEL4632 Professional Practice 3	C	SBEL3622	2	
3. Elective[1]	D		2	
4. Elective[1]	D		2	
5. Elective[1]	D		2	
6. UHAS3012 Entrepreneurship and Enterprise Development	E		2	

Note: [1] Elective courses to be advised by academic advisor (Please refer to the Elective Courses section)

Elective Courses

Course Code	Course Name	Credit
1. SBEL1642	Design Communication	2
2. SBEL1652	Introduction to Landscape Architecture	2
3. SBEL1662	Landscape Ecology	2
4. SBEL1672	History & Theory of Architecture	2
5. SBEL1682	Environmental Physics	2
6. SBEL2692	Park & Recreational Planning	2
7. SBEL2702	Site Planning	2
8. SBEL2712	Mapping Technology	2
9. SBEL2722	Resource Planning & Management	2
10. SBEL3732	GIS Application	2
11. SBEL3742	Field Study	2
12. SBEL4753	Landscape Seminar	3
13. SBEL4762	International Collaborative Programme	2
14. SBEL4812	Materials and Specifications	2

Course Code	Course Name	Credit
15. SBEL4822	Management	2
16. SBEL4782	Competition	2
17. SBEL4792	Expedition	2
18. SBEL4802	Cost Studies	2

Note: Students must complete a minimum of 33 credits of elective courses.

Programme Implementation

The programme is delivered using a variety of approaches:

1. Lectures and Tutorials
   Lectures and tutorials are the primary means of teaching and learning in the department.

2. Design Studios (Problem-based Learning)
   Studio is the essential part of the programme. Its importance is reflected in the ten hours per week allocated to each studio. Through the studio, students learn hands-on how to resolve landscape architecture issues. Through team working and under the supervision of a studio master, the students learn to implement the design and plan spaces for a specific use to demonstrate their creativity and critical thinking.

3. Design Workshops
   Workshops are conducted in or out of classroom and are for short design exercise. It is hands-on that afford students to produce designs in a short space of time. Generally, the workshops are carried out in small groups of two to five students and it can be joint-exercise with other universities. For example, the design workshops carried out in ALAM (Assembly of Landscape Architecture Students) and Putrajaya Flower and Garden Festival competition.

4. Laboratory
   Students are exposed to different software such as ArcGIS, AutoCAD, Photoshop, Sketch-up to assist them in preparation of design landscape master plan and construction drawings. The department has two laboratories: landscape laboratory and landscape computer laboratory.

5. Field Works
   In design studios, students are often exposed to real situations including projects. For example, in landscape urban design studio, students conduct site inventory and analysis as part of the planning process. Students have to do field survey to gather information on site factors, policies and social condition of the place.

6. Industrial training
   The industrial training aims to develop the skills, knowledge and attitudes needed to be a professional landscape architect. The objective is to strengthen the understanding of the theoretical principles, technical and design skills through practical experience. All third year students are required to undergo 24-weeks industrial training at landscape architect or relevant practitioner offices or a government agency of their choice. At the end of the training, students are required to submit an Industrial Training Report and log book to the department for assessment.

Student Academic Assessment

A variety of assessment methods are used to match the learning outcomes of programme and students learning styles.

1. Examinations, tests and quizzes are methods for assessing breadth of knowledge.

2. Written assignments are used to assess not only factual and theoretical knowledge but also the ability to solve problems and articulate an argument - key transferable skills. In the final semester of the programme, a greater emphasis is placed upon the analysis, synthesis and evaluation of material.

3. Case study analyses and presentations are assessed for the reasoning skills and ability to apply learned material to real-life situation.

4. Design projects, reports and work samples are assessed to evaluate competence in practical skills and techniques.

5. Verbal and visual presentations are the modes for students to illustrate or display their design ideas and assignments.

6. Project works are the design and planning assignments given to the students by their studio masters. Their work are assessed on design creativity, practicality and completeness.

7. Industrial training report and logbook are evidences that illustrate student performances at the assigned consultancy office.

8. Peer assessment assesses in group work tasks using the Rubric method.

Syllabus Synopses

The syllabus synopses below cover only the core and elective courses offered in this programme. Syllabus synopses for general courses are listed in the General Courses section. Students are encouraged to take courses offered in other programmes as free elective courses. However, students are advised to consult the head of programme before enrolling into any of these elective courses.

SBEL1404 Basic Design

This course emphasises on the basic design knowledge that includes principles of design and communication skills. Computers will be used as an option for design and communication.

SBEL1414 Community Landscape Studio (Prerequisite: SBEL1404)

Theory and practices in community planning encompass physical, environmental, economic, and social factors such as in housing, economic development, social capital, citizen participation, social welfare, public safety, education, the environment and other aspects of community life. Studio workshop and design practices are designed to address strategies and design guidelines towards sustainable and livable community.

SBEL1492 Landscape Construction I

This course is a general introduction to the properties of construction materials and processes and practices of using the materials in landscape architecture. The course is fundamental in nature which entails teaching of theory and principles of material application.

SBEL1532 Horticulture and Nursery

This course is designed as an introduction to horticulture which is aimed at acquiring basic knowledge and understanding on plant attributes, classification, propagation, and soil characteristics for growth. This course also incorporates an introduction to nursery establishment and management.

SBEL1542 Ornamental and Natural Plant Materials (Prerequisite: SBEL 1532)

This course is designed as an introduction to ornamental and natural plants. This course focuses on utilisation of ornamental plants in planting design which emphasises plants usage in terms of their functions, aesthetic and value of design. Discussions will also focus on the influence of physical and aesthetic factors in selection and application of plants in landscape design.

SBEL1592 Environmental Psychology & Socio Culture

This course explores the nature and nuances of interrelationships between people and their surroundings by examining an array of critical issues in environmental psychology. The environment is broadly defined to include not only the physical surroundings (both natural and built) but also the larger, socio-cultural and political milieu in which we live. It involves theories on place attachment and place identity as well as issues that inform urban ecological design, such as relationships to nature, landscape preferences, personal space, territoriality, and crowding. It also addresses design processes and the ways in which these can be enriched through an environmental psychology perspective.

SBEL1662 Landscape Ecology

This course relates to the understanding of ecology and ecological systems of several biomes on the Earth. It provides an understanding on the link or relationship of living organisms with the natural resources and forces; and how organisms interact with their environment at many levels. In addition, it allows an understanding of the influence of Man to the Earth, which leads to future progress or decline of the natural environment. It differentiates the natural functioning of organisms and how man has dramatically altered the ecosystem. It also gives insight how human should act as the steward (khalifah) of the land for the future of humankind.

SBEL1672 History & Theory of Architecture

This course is an introduction to the main forces that make up architecture; belief, culture, politics, climate, technology, materials and function. It also provides a global survey of past and present architectural

forms. A cursory description is presented of the historical forces that shape Western architecture and mention of Eastern architecture including Malaysia.

SBEL2425 Recreation and Park Design (Prerequisite: SBEL 1414)

This course emphasises on developing the student's ability to plan and design recreational parks. Students are expected to understand the theory of designing and planning recreational parks for communal use in accordance to the planning criteria, hierarchy and needs of a park while addressing the local cultural values and the application of park management.

SBEL2502 Landscape Construction II (Prerequisite: SBEL 1492)

This course is designed as a continuity to Landscape Construction I which emphasises the techniques and skills in integrating complex landscape construction. It also includes identifying the potentials and limitations of hard landscape materials in landscape design and planning, understanding the character and utilisation of landscape materials; and applying the construction techniques through design and construction projects. The assessment also includes the preparation of working drawings.

SBEL2552 Ethnobotany Plant Materials (Prerequisite: SBEL 1542)

This course intends to develop the skills of doing inventory and analysis of plants as elements of landscape design which focuses on the subject of ethnobotany as an option for planting palette in planting design. Local ethnobotanic plants are identified and evaluated in terms of their functions, aesthetic qualities and intrinsic values. Discussion focuses on the influence of cultural and religious or belief factors in the selection of plants and their application in landscape design.

SBEL2562 Planting Technology I (Prerequisite: SBEL 1542, SBEL2552)

This course focuses on the basic planting design theories and principles where students can apply their understanding of plants' usage, characteristics, values and functions into landscape design. This course also exposes students to relevant skills and techniques in the preparation of technical planting plans and drawings needed in landscape works. The assessment also includes the preparation of working drawings.

SBEL2612 Professional Practice I

As an introductory course, it intends to introduce and expose students to the standard of professional practice, the roles and responsibilities of the landscape architect in managing and organising landscape

practices. The students are exposed to the knowledge of landscape professional practice particularly office administration and management, project management, project organisation and professionalism, and code of ethics.

SBEL2692 Park & Recreation Planning

This course is designed as an introduction to the theory of park planning and design. This course focuses on the understanding on the aspects of parks planning and design theories, philosophies and principles. This course also exposes students to current issues, historical development, concepts, beliefs, user needs and perceptions on park development.

SBEL2712 Mapping Technology

This course emphasises the learning of land surveying and mapping methods. It is conducted by analysing information gathered from Global Positioning System (GPS) and remote sensing data interpretation (aerial photos and satellite imagery). The analysis provides information on physical landscape resources that is necessary to be planned sustainably.

SBEL2722 Resource Planning and Management

This course addresses landscape resource planning and management which focuses on inventory and analysis techniques, methods and approaches on the natural and cultural resources. It emphasises the management and planning aspects of landscape resources such as soil and geology, water, flora and fauna, land use, history, culture, land ownership, climate, infrastructure and visual quality.

SBEL3512 Landscape Construction III (Prerequisite: SBEL 2502)

This course addresses the principles of grading, land surveying and earthwork related to landscape industry which involves design and construction drawing. The course emphasises the construction, operation, mechanics and the preparation of construction drawings necessary of the irrigation systems. The assessment includes the preparation of working drawings.

SBEL3622 Professional Practice II (Prerequisite: SBEL 2612)

This course exposes students to the standard of professional practice associated with the preparations of contract document in landscape architecture works. This course focuses on the functions of contract documents, preparation techniques and procedures, and preliminary cost estimates. This programme also emphasises the contract principles, types of contracts, contract preparation procedures,

administration of pre-contract and post-contract administration. At the end of the course, students are able to prepare a contract document for landscape architectural projects with particular reference to the Final Comprehensive Project (SBEL 4486).

SBEL4486 Final Comprehensive Project (Prerequisite: SBEL 4476)

This course serves as the final comprehensive project for Bachelor of Landscape Architecture degree. The Final Comprehensive Project is the final test of a student's ability to integrate a wide range of knowledge, understanding and skills in a quasi - professional manner. It is essentially aimed at testing the comprehensiveness, sensitivity and creativity towards a landscape architectural solution. This programme provides an opportunity for students to select a topic and site themselves, and complete all the work - to detailed landscape design solutions for a particular landscape project including construction drawings.

SBEL4523 Landscape Construction IV (Prerequisite: SBEL 3512)

As an advanced landscape construction course, it focuses on theoretical and construction know-how for pool and fountain and outdoor lighting. The course addresses the technical construction requirements and techniques during design and construction processes of pool and fountain and outdoor lighting. The course involves two different modules; Module 1 covers pools and fountains, and Module 2 focuses on outdoor lighting with emphasis on its construction, operational, and mechanical systems. The assessment also includes the preparation of working drawings.

SBEL4762 International Collaborative Programme

This course provides an opportunity for students to obtain new experiences and learning environment, outside the local culture and beyond the university design studio and its curricular. Students are able to take part in short design programme jointly organised with other organisations.

SBEL4782 Competition

This course provides the opportunity for students to test their ability to compete and win design or landscape architectural competition, individually or as a group. It is a means of measuring quality of academic excellence. The culture of competing and winning particularly at international level would elevate students' competitiveness and sense of confidence. The competition also provides the platform for students to design project outside of their local environment.

SBEL4792 Expedition

This course explores students' ability for self-development with their involvement in extra-curricular activities. Examples include expeditions such as mountain climbing, island hopping, jungle-tracking, cycling, rafting and kayaking. Basic requirements such as transportation, accommodation, food, tools and equipments, safety and documentation are all organised by the students.

SBEL4802 Cost Studies

The course covers the general aspects of building economics and factors influencing construction costs, types of cost information such as cost data, cost model, cost index, cost analysis, and the principles of cost planning, cost control, and life cycle costing in construction projects. At the end of the course, students should be able to describe the various stages of the construction process, identify the factors that determine and influence construction costs, identify relevant cost information in the estimation of construction costs, and understand the principles of cost planning and cost control procedures, and life cycle costing to the different design and construction phases. The course also provides the environment to develop students' communication skills and the ability to work effectively as a team member to achieve mutual objective.

SBEL4822 Management

This course provides the students the option of undertaking a project from conception, management and implementation either in group or individually. The students should be able to manage the project, meet dead-lines, able to design projects and able to produce good graphic works suitable for publication.

SBEL1652 Introduction to Landscape Architecture

This course is designed to provide exposure, awareness, understanding and familiarity with all fundamental aspects related to landscape architecture as a design-based course, and a profession. It intends to develop an understanding of basic relationship of man and his environment and the interaction between natural and man-made elements of the environment. The skills introduce to students are the ability to observe, evaluate and explore the potential and relevance of landscape architecture through assignments, discussions and small design exercises. Students are to demonstrate an appreciation of the importance of design, resourcefulness and creativity in any landscape design work.

SBEL1582 History of Landscape Architecture

The course is a comprehensive appreciation of the designed landscape past and present, encompassing gardens of urban and regional in scale and character. Each school of landscape thoughts and practices will initially address environmental, social, philosophical and artistic expression that pertains to architecture and landscape.

SBEL1642 Design Communication

This course introduces students to the method of manual and computer-aided design communication in landscape architecture. It covers aspects related to basic communication skills i.e.; visual and verbal communication which integrates the usage of relevant design software for graphic such as AutoCAD (2D drafting), Adobe Photoshop, and SketchUp.

SBEL2435 Urban Landscape Design (Prerequisite: SBEL 2425)

This course emphasises the aspects and theories of urban landscape design. It deals with the functions of the urban spaces, their relationship and visual impact in relation to the urban context, private or public spaces, indoor or outdoor spaces It requires creative and intuitive approach with application of scientific principles together with technical knowledge to be formulated into guidelines in the creation of urban spaces suitable for places to live, work and play. It also involves aspects such as the economics, social and cultural factors of the people in creating a conducive and safe environment.

SBEL2602 Heritage Landscape and Conservation

The course deals with an appreciation of the philosophy of conservation and the historic environment that have literary and artistic associations. It involves addressing general types of cultural landscape which require understanding of management: urban landscapes, designed landscapes, vernacular landscapes, and relict landscapes including World Heritage Sites.

SBEL2702 Site Planning

This course trains students to undertake a systematic and scientific study of a development site before detailed development planning and design are to commence. It includes the elements of site inventory and investigation; quantitative and qualitative approaches to site analysis and planning; preparation of composite plans for site suitability analysis; formulation of design rationales and generation of design concepts. Assessment of the site covers the physical, biological and socio-cultural elements of site planning.

SBEL3445 Landscape Resource Planning (Prerequisite: SBEL 2435)

This course develops the understanding on the landscape planning process and skills in surveying, analysing and evaluating data using appropriate methods, policy making and design developments. It concentrates on the understanding of: planning systems and framework, governance, resource assessment and management (physical, social, cultural, historical and heritage), analysis techniques, presentations and communication skills for primary and secondary data collection with application of analysis techniques, manually and by using computer (GIS software). Development of various approaches for sustainable resource planning includes tourism planning and management. Method of preparing reports (inceptions, technical, management, and detailed plan) is also taught and applied at every stage of the course.

SBEL3458 Industrial Training 1 (Prerequisite: SBEL 3445)

This course is designed to provide practical training opportunity in the landscape industry which aims to expose students to the professional landscape practices in government or private organisations. Students are required to be involved in various development projects and problem-solving activities, field work (such as inventory, analysis of data and design), and landscape development plan (eg, residential, institutional, industrial, business, recreation and tourism). Understanding of landscape architect's duties, administration, services, financial management and development in the firm or organisation is also required.

SBEL3464 Industrial Training 2 (Prerequisite: SBEL 3445)

This course is designed to produce a technical report reflecting the student's experience and knowledge gained during involvement in various development projects and problem-solving activities, field work (such as inventory, analysis of data and design), and landscape development plan (e.g., residential, institutional, industrial, business, recreation and tourism).

SBEL3572 Planting Technology II (Prerequisite: SBEL 2562)

This course is a continuation to Planting Technology 1 (SBEL 2562) which addresses the aspect of space and place making, portraying image of a place or building, place identity and functional value of a place and planting design guidelines for different environmental contexts. It also focuses on the application of planting design skills in various types of land uses including institutional, residential, commercial, and recreation.

SBEL3732 GIS Application (Prerequisite: CODE)

This course promotes resource planning analysis to in maintain the stability of natural resources and the environment. The introduction to Geographic Information System (GIS) is done to assist the resource planning analysis undertaken. The application of GIS is intended to ease resource planning decisions fairly, rapidly and accurately. Beside this, the integration of GIS capability and planning techniques would strengthen the understanding of resource planning analysis applied in the Landscape Resource Planning Studio.

SBEL3742 Field Study

This course develops basic understanding and skills for organising field trip. It focuses on team working and lifelong learning. It also introduces planning, organisation and implementation discussions, meetings, networking, and the field trip.

SBEL4476 Topical Studies (Prerequisite: SBEL 3458, SBEL 3464)

This course covers 3 stages; Research Methodology, Writing and Design Stage. It is a precursor to the Final Comprehensive Project. This course will evaluate the student's ability to integrate knowledge, understanding and skills in landscape architecture. Students will be given an opportunity to select a subject and site of his or her interest (with advice from tutors). Students shall conduct and formulate design guidelines to address identified problems or issues on the site. The subject may be from seven areas (topics) namely housing, institutional, commercial, recreational, industrial, conservation and restoration. The later stage of this course provides a platform for students to expand and translate their research findings into preliminary landscape master plan which shall be further explored in the Final Comprehensive Project.

SBEL4632 Professional Practice III (Prerequisite: SBEL 3622)

This course focuses on landscape management practice which encompasses management and maintenance theories in landscape works operation. Discussions will focus on roles of landscape architects in management of major resources such as manpower, finance, materials, equipment and facilities in landscape operation works.

SBEL4812 Materials and Specifications

The aim of this course is to introduce students to the properties and behaviour of common materials used in construction and method of drafting specification. It is intended to enable students to be conversant

with the building materials and typical method of specification writing. This course will cover the details on construction materials including classification, sources, manufacturing process, tests involved and evaluation on appropriateness of construction materials. It also includes aspects of concrete technology and soil mechanics. The course also provides the environment to develop students' ability to communicate work effectively as a team member to achieve mutual objective.

Bachelor of Science in Construction

Introduction to the programme

Modern construction projects are known for their complexity in design and speed of execution. They require significant utilisation of resources such as materials, manpower, equipment and finance. Most of the projects are performed under conditions of scarcity of resources and suffers from uncertainty in their supply. Work delays will result in increasing costs since there is an intricate time-cost relationship for every project. The need for proper planning and management of construction can never be over-emphasised.

The Bachelor of Science in Construction curriculum is designed to provide a solid academic base and professional expertise in the discipline of construction management, and to critically address the present and evolving needs of the construction industry. In order to perform successfully in the construction industry, students must develop an understanding of the technical aspects of construction while applying construction management practices and tools to maintain control and provide informed, optimal decisions. The programme focuses on the understanding of construction technology, construction management and production management processes. The programme also addresses the generic skills and capabilities necessary to compete in the employment market.

The programme addresses a combination of engineering technology, construction techniques and management. It is designed to prepare graduates for managerial positions in the construction industry. At a personal level, the programme will inculcate professional and ethical approach that will foster the graduates' personal development, self-respect and career aspirations.

Name of Award

Bachelor of Science in Construction [B.Sc.(Const.)]

Programme Philosophy

Students of the Bachelor of Science in Construction programme will be taught courses and given practical experience in construction technology and management to enable them to become project managers and construction contractors to meet the needs of the country.

Programme Aim

To produce professional construction project managers or construction contractors who are able to plan, manage, supervise construction projects responsibly and efficiently for society and the creator.

Programme Education Objectives

Bachelor of Science in Construction has 5 programme educational objectives:

PEO1 To provide graduates with solid foundation in management and technical knowledge, skills and capabilities in the field of construction.

PEO2 To produce graduates who are effective problem solver, knowledgeable in applying logical, critical and creative thinking to a range of problem.

PEO3 To provide graduates with a broad knowledge, leadership and managerial skills which are necessary for the effective delivery of construction projects.

PEO4 To produce graduate who are capable of executing their responsibilities with professionalism and capable of lifelong learning in the pursuit of personal development and betterment of society.

PEO5 To provide graduate with basic communication skills, lead effectively and able to work collaboratively and in multidisciplinary team.

Programme Learning Outcomes

The intended learning outcomes of the Bachelor of Science in Construction programme are:

PO1 Capable of acquiring knowledge and understanding of construction management, construction technology, and related knowledge and practices.

PO2 Capable of applying the techniques, skills and tools of project management, construction technology, broad-based management to the practice of construction management

PO3 Capable to think critically and use scientific approach to solve construction management related problems

PO4 Capable to communicate effectively with confidence orally, visually and in written form

PO5 Capable to establish responsible interpersonal and intrapersonal relationship with good team working spirit

PO6 Capable to apply high ethical and moral standards in professional practices and social interaction

PO7 Capable to seek information and accept new ideas, and learn independently

PO8 Capable to use knowledge and managerial skills to identify potential business opportunities

PO9 Capable of demonstrating leadership skills and proactiveness

Programme Accreditation

The Bachelor of Science in Construction is recognised by the Public Services Department and accredited by the Royal Institution of Chartered Surveyors, United Kingdom. Graduates from this programme can pursue a higher degree in universities in United Kingdom and Australia and other countries as the degree is internationally recognised.

Career Prospects

Graduates of the programme can work as:

1. Construction Project Managers
2. Construction Project Planners
3. Construction Site Superintendents
4. Construction Health and Safety Officers and other comparable and relevant posts in the construction industry

Mode and Duration of Study

Mode of Study: Full-time.
Minimum Duration: 4 years
Maximum Duration: 6 years

Classification of Courses

Courses offered under this programme are based on the classification scheme shown in the table below:

Classification	Course Group	Credits	Total credit	Percentage
1. Programme Core	A. Construction Technology & Services	21	78	61
	B. Measurement & Documentation	6		
	C. Economics & Finance	7		
	D. Legal & Contractual Studies	6		
	E. Professional Practice	18		
	F. Management & ICT	14		
	G. Research & Development	6		

Classification	Course Group	Credits	Total credit	Percentage
2. Elective Courses	H. Elective Courses	30	30	23
3. General Courses	I. General Courses	20	20	16
	Total credit hours to graduate		128	100

Award Requirements

To be eligible to graduate from this programme, students must achieve a total of not less than 128 credit hours accumulated from courses that are set according to the classification scheme shown in the Classification of Courses section, with a minimum CGPA of 2.0.

List of Courses According To Semester

Semester 1

Course	Course Group[1]	Prerequisite	Credit	Total Credit
1. SBEC1112 Construction Technology I	A		2	16
2. SBEC1512 Introduction to Built Environment	E		2	
3. SBEC1812 Draughtsmanship[1] 4. SBEC1822 Materials & Specifications[1] 5. SBEC1832 Construction Mathematics[1] 6. SBEC1842 Principles of Economics[1] 7. SBEC1852 Introduction to Computer[1]	H		8	
8. UHAS1172 Malaysian Dynamics (Local) 9. UHAS1162 Arts, Custom and Beliefs (International)	I		2	
10. UICI 1012 Islamic and Asia Civilisation	I		2	

Note : [1] Register only 4 courses from the 5 listed elective courses. The choice of the electives to be taken will be based on student's academic qualification.

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEC1122 Construction Technology II	A		2	16
2. SBEC1133 Building Services I	A		3	
3. SBEC1142 Principles of Structures	A		2	
4. SBEC1213 Introduction to Construction Measurement	B		3	
5. SBEC1612 Principles of Management	F		2	
6. UHAS2122 Critical and Creative Thinking	I		2	
7. ULAB1112 English for Academic Communication	I		2	

Semester 3

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEC2112 Construction Technology III	A		2	16[1]
2. SBEC2123 Building Services II	A		3	
3. SBEC2213 Construction Measurement I	B	SBEC1213	3	
4. SBEC2413 Principles of Law, Contract & Tort	D		3	
5. SBEC2613 Planning & Scheduling	F		3	
6. UICI2022 Science, Technology and Mankind	I		2	
7. ULAM1112 Malay Language for Communication (International)[1]				

Note : [1] Compulsory course for international students. Total credit enrolled for international students would be 18 units. International students are advised to enrol for the course in the earlier semester.

Semester 4

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEC2132 Construction Technology IV	A		2	18
2. SBEC2142 Engineering Survey	A		2	
3. SBEC2312 Cost Studies	C		2	
4. SBEC2423 Contract Administration	D	SBEC2413	3	
5. SBEC2622 Construction Project Management	F		2	
6. SBEC2823 Construction Measurement II[1] 7. SBEC2813 Facilities Maintenance[1]	H		3	
8. UHAS3102 Entrepreneurship and Enterprise Development	I		2	
9. ULAB2112 Advanced English for Academic	I		2	

Note : [1]Register only 1 course from the 2 listed elective courses.

Semester 5

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEC3113 Construction Plant & Temporary Works	A	SBEC1142	3	16
2. SBEC3313 Estimating & Tendering	C		3	
3. SBEC3613 Construction Site Management	F		3	
4. SBEC3622 Construction Safety	F		2	
5. SBEC3822 Financial Management[1] 6. SBEC3832 Land Law[1] 7. SBEC3842 Construction Productivity & Quality[1]	H		4	
8. UKQ XXX1 Co Curriculum 1	I		1	

Note : [1]Register only 2 courses out of the 3 listed elective courses

Semester 6

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEC3518 Industrial Training	E		8	12
2. SBEC3524 Industrial Training Reports	E		4	

Semester 7

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEC4312 Development Economics	C		2	18
2. SBEC4712 Research Method	F		2	
3. SBEC4853 Construction Information Technology	F		3	
4. SBEC3812 Sustainable Construction	F		2	
5. SBEC4813 Construction Technology & Design[1] 6. SBEC4823 Mechanical & Electrical Works Measurement[1] 7. SBEC4833 Urban & Land Economics[1] 8. SBEC4843 Value Management[1]	H		6	
9. UHAS2092 Proffesional Ethics	G		2	
10. UKQ XXX1 Co Curriculum 2	I		1	

Note: [1]Register only 2 courses out of the 4 listed elective courses

Semester 8

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEC4514 Project Planning & Implementation	E	SBEC2613 SBEC2622	4	16
2. SBEC4724 Undergraduate Project	G	SBEC4712	4	
3. SBEC4863 Civil Engineering Work Measurement[1] 4. SBEC4873 Construction & Development Law[1] 5. SBEC4883 Construction Business Practice[1]	H		6	
6. ULAB3122 English for Workplace Communication	I		2	

Note: [1]Register only 2 courses out of the 3 listed elective courses

Programme Implementation

The programme is delivered using a variety of approaches, in general, the programme is realised based on the following approaches:

1. Lectures and Tutorials.
   The theories are taught through lectures and tutorials according to a fixed schedule.

2. Laboratory and Field Works.
   Laboratory and field works will give better exposure to the students and make them more conversant with the construction process itself.

3. Problem Based Learning (PBL).
   Problem Based Learning is a very important component of teaching and learning process. PBL is implemented in a number of courses in this programme. This teaching and learning approach helps students to reinforce their understanding on the course contents.

4. Industrial Training.
   All third year students are required to undergo a 24 weeks of industrial training at company operating in the construction industry approved by the coordinator or government departments. The work experience will be monitored by a lecturer in one industrial placement visit, a monthly report sent by the student back to the department, a daily diary and employer's reports.

5. Final Year Project.
   A dissertation project has to be submitted by the student at the end of the final year. The project which is a culmination of interdisciplinary knowledge allows students to draw on to it as they complete the project.

Student Academic Assessment

A variety of assessment methods are used to match the learning outcomes of the programme and students learning styles.

1. Examinations, Tests and quizzes are valuable methods for assessing breadth of knowledge.

2. Written assignments are used to assess not only factual and theoretical knowledge but also the ability to solve problems and articulate an argument - key transferable skills. In the final semesters of the programme, a greater emphasis is placed upon the analysis, synthesis and evaluation of material.

3. Case study analyses and presentations to assess reasoning skills and ability to apply learned material to real-life situations.

4. Design projects, reports and work samples to assess competence in practical skills and techniques.

5. Poster and oral presentations and video production to assess communication and presentation skills.

6. Seminar papers and critical reviews to assess ability to analyse and synthesise information.

7. Project work assesses ability to work independently and collaboratively, search and critically review relevant literature and to present findings in an academic manner in both written and verbal form.

8. Evidence based industrial training reports which document the students' performance in professional placement.

9. Online assessments, including self-tests, quizzes and surveys.

Syllabus Synopses

The syllabus synopses below cover only the core and elective courses offered in this programme. Syllabus synopses for general courses are listed in the General Courses section. Students are encouraged to take courses offered in other programmes as free elective courses. However, students are advised to consult the head of programme before enrolling into any of these elective courses.

SBEC1112 Construction Technology I

The aim of this course is to develop an understanding of construction technology and its application to the construction of low-rise domestic and commercial buildings not more than 5 storey high. It will examine the processes and techniques related to the construction of substructures, frames, enclosure and finishes for low-rise domestic and commercial buildings. The course will also introduce students to Uniform Building by Laws (UBBL). The course will provide students with construction knowledge to be applied in

other courses such as estimating, measurement, construction planning and services. The course also provides the environment to develop students' communication skills and the ability to work effectively as a team member to achieve mutual objective.

SBEC1122 Construction Technology II

The aim of this course is to develop an understanding of construction technology and its application to the construction of medium span, low-rise commercial, industrial and community buildings. It will examine the processes and techniques related to the construction of substructures, frames, enclosure and finishes for medium span, low-rise commercial, industrial and community buildings. The course will provide students with construction knowledge to be applied in other courses such as estimating, measurement, construction planning and services. The course also provides the environment to develop students' ability to communicate technical information graphically and to work effectively as a team member to achieve mutual objective.

SBEC1133 Building Services I

The aim of this course is to provide knowledge and understanding of the building environment and the need for the various building services systems. This course will cover the common building services system and equipment within a building. It is intended to enable students to be conversant with the building services engineering and provide students with building services knowledge to be applied in other courses such as estimating, measurement and construction planning. The course also provides the platform to develop students' communication skills and the ability to work effectively as a team member to achieve mutual objective.

SBEC1142 Principles of Structures

This course is intended to encourage an appreciation of the structure of buildings and develop concepts of structural action, leading to an ability to model, analyse and design common elements and structural frames. The focus of this course is on understanding the forces in structures and the behaviour of some structural materials. Students will come to understand the forces which are created in the building framework and the structural elements, and be able to safely design simple structural units.

SBEC1213 Introduction to Construction Measurement

The aim of the course is to equip the students with the knowledge and skills of measurement and quantification of building works to complement the needs of the profession. This course introduces the concept and principles of measurement and quantification of building works and its relationship with

costing and preparation of tender and contract documents. The course will focus on the application of the principles of measurement and introduction to quantification of simple building works. The course also provides the environment to develop students' communication skills.

SBEC1512 Introduction to Built Environment

This course is designed to introduce students to both the structure and the procedures of the construction industry. Topics will include an overview of the construction industry and the industry's impact on the economy, the structure of the construction industry, the organisations within construction, the members of the construction team, the basics of the construction process and the major procedure of the construction industry. It also includes an introduction to construction industry careers and a preview of the construction degree curriculum. The course also provides the environment to develop students' ability to work effectively as a team member to achieve mutual objective.

SBEC1612 Principles of Management

This course provides knowledge and develops the understanding of the principles of management including the current changes and developments. It emphasises the elements of organisation, decision making, planning, leadership and motivation. It also serves as a platform to develop students' skills and competencies in management. The course also provides the environment to develop student's ability to create good relationship, interaction with colleague and work effectively with other people to achieve mutual objective.

SBEC1812 Draughtsmanship

The course is designed to provide students with the knowledge and skills to interpret and prepare construction drawings. The topics will include the fundamentals of technical drawing, including drawing and dimensioning practices, orthographic projections, isometric drawing and sketching, auxiliary and sectional views, and computer-aided drafting (CAD). At the end of the course, students will demonstrate their ability to interpret, explain, quantify and use working drawings. The course also provides the platform for students to develop their ability to communicate construction information visually and graphically.

SBEC1822 Materials & Specifications

The overall aim of this course is to introduce students to the properties and behaviour of common materials used in the construction and method of drafting specification. It is intended to enable students to be conversant with the building materials and typical method of specification writing. This course will

cover the details on construction materials including classification, sources, manufacturing process, tests and evaluation on appropriateness of construction materials. It includes aspects of concrete technology and soil mechanics. The course provides the environment to develop students' ability to communicate effectively as a team member to achieve mutual objective.

SBEC1832 Construction Mathematics

Construction management and quantity surveying are technical disciplines which require the collection, processing and use of numerical data. It is therefore essential that students develop an acceptable understanding of the mathematical methods and techniques required for these key activities, and of how to apply them correctly. This course explores the rules for manipulation of formulae and equations, calculation of lengths, areas and volumes, determination of trigonometric and geometric properties, and the application of graphical and statistical techniques. Upon completion students will be able to select and apply appropriate mathematical techniques to address a wide variety of standard, practical, industry-related problems.

SBEC1842 Principles of Economics

This course provides students with the basic understanding on the economic principles and its application to the construction industry. It consists of basic micro and macroeconomic principles, demand & supply, market structure, national income, money and banking, fiscal policy and budget, business cycle and economic growth. The course also provides the environment to develop students' communication skills and ability to work effectively as a team member to achieve mutual objective.

SBEC1852 Introduction to Computer

This course is designed to provide an introduction to computers, programming and application softwares. Areas of study include IT policy and ethics, computer hardware, internet, problem solving and programming. It also provides students with experience in using a range of computer software packages, and develop skills in the choice and use of computing tools for various tasks. The course also enables students to seek information from a variety of sources.

SBEC2112 Construction Technology III

The aim of this course is to develop an understanding of construction plants and machinery, method and techniques in demolition, renovation and repair works including the technology of industrialised and more advance construction. The course will provide students with skills to evaluate a range of technologies for the adoption of an appropriate design decision and knowledge of the centrality of technological decision

making in the context of the wider construction process. The course also provides the environment to develop students' communication skills and ability to work effectively as a team member to achieve mutual objective.

SBEC2123 Building Services II

The aim of this course is to provide knowledge and understanding of the various building and infrastructure services. This course will cover the common building and infrastructure services system and equipments. It is intended to enable students to be conversant with the building and infrastructure services engineering and provide students with the knowledge to be applied in other courses such as estimating, measurement and construction planning. The course also provides the platform to develop students' communication skills and ability to work effectively as a team member to achieve mutual objective.

SBEC2132 Construction Technology IV

The aim of this course is to develop an understanding of civil engineering structure and special construction. The course will provide students with skills to evaluate a range of technologies for the adoption of an appropriate design decision and knowledge of the centrality of technological decision making in the context of the wider construction process. The course also provides the platform to develop students' communication skills and ability to work effectively as a team member to achieve mutual objective.

SBEC2142 Engineering Survey

This course aims to introduce the concept and practical skills of land surveying in building construction projects. This course introduces students to the concept and practical skills of land surveying in building construction projects. It will emphasise on the layout and control of buildings, use and care of surveying instruments, directions, angles, surveying calculations, errors and computations of areas and volumes. At the end of the course, students will demonstrate the ability to set out building structures, earthwork and drainage works. The students should be familiar with the methods of controlling the vertical alignment of buildings. The course also provides the platform to develop students' ability to work effectively as a team member to achieve mutual objective.

SBEC2213 Construction Measurement I (Prerequisite: SBEC 1213)

The aim of the course is to equip the students with the knowledge and skills of measurement and quantification of building works to complement the needs of the profession. This course will further

develop the knowledge, understanding and the skill of measurement of construction works according to SMM for Building Works for the purpose of preparation of bills of quantities and estimating. The course will focus on the application of the principles of measurement and quantification of low rise building works.

SBEC2312 Cost Studies

The course covers the general aspects of building economics and factors influencing construction costs, types of cost information such as cost data, cost model, cost index, cost analysis, and the principles of cost planning, cost control, and life cycle costing in construction projects. At the end of the course, students should be able to describe the various stages of the construction process, identify the factors that determine and influence construction costs, identify relevant cost information in the estimation of construction costs, and understand the principles of cost planning and cost control procedures, and life cycle costing to the different design and construction phases. The course also provides the environment to develop students' communication skills and ability to work effectively as a team member to achieve mutual objective.

SBEC2413 Principles of Law, Contract & Tort

The aim of this course is to provide students with the basic principles of law. The objectives are: one; to introduce the main principles of the Malaysian legal system, two; to elucidate certain specified principles of the law of tort, agency and sale of goods relevant to construction works and three; to instil good understanding of the principles of the law of contract. This course is divided into five parts namely: The Malaysian legal system, law of tort, contract, agency and sale of goods. The course also provides the environment to develop students' ability to express ideas clearly and logically in spoken and written forms.

SBEC2423 Contract Administration (Prerequisite: SBEC 2413)

The aim of this course is to cover all the relevant clauses related to the administration of contract for construction works. The PWD/JKR 203 & 203A and PAM 2006 Standard Forms of Contract will be used as the main references for the lectures and tutorials. The significant differences between these standard forms will be highlighted in the lectures. Other standard forms of contract that is CIDB Standard Form of Contract 2000 Edition, Design and Build and JCT Standard Forms of Contract will also be mentioned during the lectures. This course will furnish the knowledge and understanding of the clauses in the various standard forms of contract used for building works. This will include the contract terms and condition in the planning and implementation of project development with emphasis given to contract administration. The course will focus on the law with regard to construction work based on standard forms of contract most commonly used in Malaysia related to private and public projects. The course also

provides the environment to develop students' communication skills and ability to work effectively as a team member to achieve mutual objective.

SBEC2613 Planning & Scheduling

This aim of this course is to provide knowledge and skills on the concepts, methods and techniques in construction planning, scheduling and control systems necessary to effectively manage a construction project. Emphasis will be placed on the skills and knowledge necessary to plan and schedule a project. Coordination of manpower, materials, equipment, project funding, and cash flow are all concerns that must be monitored and controlled. Efficiency and use of the computers to facilitate the planning and scheduling process is integrated throughout the class. The course also provides the environment to develop students' ability to work effectively as a team member to achieve mutual objective, and to seek information from various sources.

SBEC2622 Construction Project Management

The course emphasises on the theoretical and practical aspects of the management of the construction projects such as houses, office buildings, shopping complexes etc. It is a course designed to allow students to learn, understand and develop their knowledge in the theory and practice of construction management. It includes the theory and practical aspects of material, labour, plant, sub-contractor, time, cost, quality and risk management. The course also goes into detail on the process of construction, construction team and organisation, and the management elements of planning, organising, coordinating and controlling. The course also emphasises on the preparation of various types of work programmes.

SBEC2813 Facilities Management

This course introduces the students to the various building component, understand the various basic systems and functions of building components and their integration with the building system, concept of facilities management and its application in various organizations in the construction industry. It covers the history, concept and principles of facilities management, the stages in undertaking facilities management, and financial, monitoring and controlling of facilities management. At the end of the course, the students should be able to describe the concept and principles of facilities management, and apply the knowledge of facilities management to the practice in the construction industry. The course also provides the platform to develop students' communication skills and ability to work effectively as a team member to achieve mutual objective.

SBEC2823 Construction Measurement II

The aim of the course is to equip students with the knowledge and skills of measurement and quantification of construction works to complement the needs of the profession. This course will further develop the knowledge, understanding and the skills of measurement of construction works according to SMM for Building Works for the purpose of preparation of bills of quantities and estimating. The course will focus on the application of the principles of measurement and quantification of construction works in high rise, large and more complex structures. The course also provides the platform to develop students' ability to communicate effectively in written form.

SBEC3113 Construction Plant & Temporary Works (Prerequisite: SBEC 1142)

This course provides a working knowledge on construction plant and temporary structures. Topics will include an introduction to principles and techniques for selecting and managing construction equipment. Review and evaluate the types of earthmoving and other construction equipment, including the estimating and analysis of production, ownership and operating costs. Study of temporary structures used to support construction operations such as formwork, scaffolding systems, shoring systems, cofferdam, underpinning, slurry walls and construction dewatering systems. Upon successful completion of this course, the student will develop a working knowledge of common construction plant and equipments and their management imperatives and techniques. Students should understand the different types of temporary structures used to support construction and able to identify alternative solutions to the temporary structures design.

SBEC3313 Estimating & Tendering

This course is designed to provide students with the knowledge and skills in preparing cost estimates with the emphasis on the relationship between the various tendering procedures and documentation on the final submitted tender price. By identifying the costs, students will be able to determine the appropriate cost data and its sources to be applied in the estimates while enhancing the accuracy and reliability of these methods and techniques. Tendering efficiency will also be increased due to understanding of bidding strategy. The course also provides the platform to develop students' ability to work effectively as a team member to achieve mutual objective, and to seek information from various sources.

SBEC3518 Industrial Training

This course aims to provide students with industry experience and to consolidate the theoretical content from the course by exposing the students to real construction industry scenario, practices and procedures. Students will be placed at construction firms or government departments. At the end of the industrial

training, students should be able to use the techniques, skills and tools learned theoretically. The students should also be able to function effectively in a team, seek information and acquire contemporary knowledge, present information and express ideas clearly, effectively and confidently, listen actively and respond to ideas of other people, recognise and respect the attitudes, actions and belief of others.

SBEC3524 Industrial Training Reports

This course requires the students to produce a report on the industrial training carried out. The report will cover tasks undertaken and experiences gained by the students during the period of training at the respective firms or departments. After completing the report, the students should be able to present information and express ideas clearly, effectively and confidently.

SBEC3622 Construction Safety

This course addresses issues, concepts, legislation and practice pertinent for effective construction health and safety management. It serves to develop critical understanding of the requirements and practice of construction safety management. The course also provides the platform to develop students' communication skills and ability to work effectively as a team member to achieve mutual objective.

SBEC3812 Sustainable Construction

This course explores the primary interfaces between the technologies of sustainable and high technology buildings. It will deal with current environmental and legislative issues with regard to technological design and specification of contemporary and innovative buildings. In addition, students will examine the wider local and international perspectives on the concept of sustainable development and natural resource management. Site study visits will be undertaken to local sustainable and high technology buildings in occupation and under construction. The course also provides the platform to develop students' communication skills.

SBEC3832 Land Law

This course provides the students with the understanding and knowledge on the concepts and legal principles relating to land tenure and administration in Malaysia. It focuses on the concept and principles of land law, the compulsory acquisition of land by the government, the relationship between landlord and tenant, strata title, principles and procedures of conveyancing. The course also provides the platform to develop students' communication skills, and ability to work effectively as a team member to achieve mutual objective.

SBEC4312 Development Economics

This course provides knowledge and understanding to students on the concept, elements and components of project development economics. It covers the relationship between the construction industry, property market and economic development, aspects of property development, investment appraisal and sources and types of development finance. At the end of the course, students should be able to describe the relationship between the construction industry, property market and the economy, property development process, identify the factors to be taken into consideration in development appraisal for different types of property, development control, prepare simple development appraisal using the residual and the cash flow method and identify the different types and sources of development finance. The course also provides the platform to develop students' communication skills.

SBEC4514 Project Planning & Implementation (Prerequisite: SBEC 2613 & SBEC 2622)

This course develops students' ability to critically evaluate, synthesise and integrate knowledge gained from a variety of sources related to the construction development process. It provides students the opportunity to develop practical capability of applying the concepts and practices of construction project management in a simulated real life project-based scenario. The problems within the case study material will address issues related to the management of construction clients and other project stakeholders and the planning, coordination and management of a project from its design stage through to production stage. The students will need to formulate responses to the practical problems posed in the context of the overarching construction project constraints of time, cost, quality sustainability, health and safety management. Students are required to examine the options available for the organisation, planning and management of the design and construction processes of a building project. The use of group work in this course reflects the industry emphasis on team working across professional disciplines. A final report on the case study is to be submitted for evaluation and assessment.

SBEC4712 Research Method

This course is designed to provide the knowledge and skills to undertake research works. It covers the process and techniques of research, research design, identification of research areas and the preparation of research proposal. At the end of the course, students should be able to identify issues, problems and areas of research, identify relevant data and information required for the research, develop data collection techniques, design research process and prepare research proposal. Students should also be able to seek information from a variety of sources, open to new ideas and have the capacity for self-directed learning, look for alternative ideas and solutions, present information and express ideas clearly, effectively and confidently and act ethically with integrity and social responsibility.

SBEC4724 Undergraduate Project (Prerequisite: SBEC 4712)

This course is a continuation of Research Method (SBQ 4712) and requires the students to undertake a dissertation project based on the research proposal prepared in Research Method. At the end of the course, the students should be able to undertake a literature review, identify data and information relevant to the research and its source, collect data and information use the appropriate data collection techniques, analyse and synthesise data, draw findings from research undertaken and prepare a clear systematic dissertation report. Students should also be able to seek information from a variety of sources are open to new ideas and have the capacity for self-directed learning, look for alternative ideas and solutions, present information and express ideas clearly, effectively and confidently and act ethically with integrity.

SBEC4813 Construction Technology & Design

This course is intended to consolidate the knowledge gained in Principles of Structure and to extend this knowledge to the design and construction of multi-storey building structural systems. The emphasis is placed on the fundamentals of structural design and drafting, covering applications in reinforced concrete and steel construction. It also introduces students to the fundamentals of geotechnical engineering, which is essential in appreciating the relation of soil properties and implications to foundation choices and designs. Appropriate codes and specifications, methods for selecting structural elements and foundations are studied and practiced. Relationship of structural framing and foundation plans, details and shop drawings to specific learning topics is also covered. The course provides the platform to develop students' communication skills, and ability to work effectively as a team member to achieve mutual objective.

SBEC4823 Mechanical & Electrical Works Measurement

The aim of the course is to equip the students with the knowledge and skills of measurement and quantification of building works to complement the need of the profession. This course will further develop the knowledge, understanding and the skills of measurement of mechanical and electrical (M&E) works according to SMM for Building Works for the purpose of preparation of bills of quantities and estimating. The course will focus on the application of the principles of measurement and quantification of mechanical and electrical (M&E) installation commonly found in buildings.

SBEC4833 Land & Urban Economics

The aim of this course is to provide students with an understanding of the theoretical aspects of land and urban economics and development economics. This course will cover the economics of land, urban planning, housing and commercial property market; the concept of urbanisation and the theories of

location, urban structure and urban growth. The course also provides the platform to develop students' communication skills, and ability to work effectively as a team member to achieve mutual objective.

SBEC4843 Value Management

This course introduces the students to the concept of value management and its application in the construction industry. It covers the history of value management, the concept and principles of value management, the concept of cost and significant items, the stages in undertaking value management, and the application of the function analysis system technique. At the end of the course, the students should be able to describe the concept and principles of value management, and apply the knowledge of value management to the practice in the construction industry. The students should be able to function and communicate effectively in a team and demonstrate leadership skills.

SBEC4853 Construction Information Technology

This course enhances student's knowledge and understanding of the information technology application in the construction industry. The emphasis of the course is to enable the student to understand the importance of information and communication technology in construction industry. This course covers the use of information and communication technology in the construction industry, its development and its strategic implementation.

SBEC4863 Civil Engineering Construction Measurement

The aim of the course is to equip students with the knowledge and skill of measurement and quantification of civil engineering works to complement the needs of the profession. This course will further provide the knowledge, understanding and skill of measurement of civil engineering works according to Malaysian Civil Engineering Standard Method of Measurement (CESMM) for the purpose of preparation of bills of quantities and estimating. The course will focus on the application of the principles of measurement and quantification of infrastructure and civil engineering works.

SBEC4873 Construction & Development Law

The aim of this course is to provide knowledge on the laws relating to the requirements, procedural aspects, rights and liabilities which have to be complied within the construction and development processes. This course introduces the law relating to construction, property and land development. It provides the students with a general understanding of the laws and develops the student's ability to apply the legal principles in construction and development law.

SBEC4883 Construction Business Practice

This course introduces students to the basics of construction business management combining knowledge gained in construction technology and processes, management, economics and finance from other courses to provide the management tools to help manage a construction business enterprise achieving organisational objectives. It will also provide the students with the necessary business values and entrepreneurial skills to analyse business strategies and policies affecting business decisions. The students are to apply critical thinking skills to evaluate and solve problems and apply long-life learning attitudes.

General Courses

Introduction

General courses are aimed at developing students' cognitive, affective and psychomotor potentials. These courses are divided into 4 clusters:

1. Nationalism and civilisation
2. Innovation, creativity and entrepreneurship
3. Personal and society development and globalisation
4. Co-curriculum

Course Clusters

The total credits that undergraduate students have to enrol under the General Courses category are specified in the Classification of Courses section under the respective programmes. Students must earn a specified number of credits designated in each course cluster in order to fulfil the graduation requirements as shown in the table below:

	Course Cluster / List of Courses	Offering Faculty[1]	Status[1]	Required Credit
1.0	**Nationalism and Civilization**			**6**
	UICI1012 Islamic and Asian Civilisation	FTI	1	2
	UICI2022 Science, Technology and Mankind	FTI	1	2
	UHAS1172 Malaysian Dynamics	FPPSM	2	2
	UHAS1162 Arts, Customs and Beliefs of Malaysian	FPPSM	3	
2.0	**Innovation, Creativity and Entrepreneurship**			**4**
a.	**Innovation and creativity**			
	UPPP3002 Research Methodology	FP	4	
	UHAS2122 Critical and Creative Thinking	FPPSM	4	2
	UKQU2202 Innovation and Creativity	CGCC/CSI	4	

[1] Please refer to the notes at the end of this table

Course Cluster / List of Courses	Offering Faculty[1]	Status[1]	Required Credit
b. Entrepreneurship			
UHAS3102 Entrepreneurship and Enterprise Development	FPPSM	4	
UCSD2762 Basic Techno Entrepreneurship	FSKSM	4	
UHAS2012 Social Entrepreneurship	FPPSM	4	2
UPPL2012 Entrepreneurship Education	FP	4	
UICI2132 Islamic Entrepreneurship	FTI	4	
UKQU2112 Entrepreneurial Practices II	CGCC	5	
3.0 Personal and Society Development and Globalisation			**8**
a. Communication			
UHAB1412 English for academic communication	AB	1	2
UHAB2422 English for advance academic communication	AB	1	2
UHAB3012 English for Career Search	AB	4	
UHAB3022 English for Workplace Communication	AB	4	
UHAB3032 Reading for Specific Purposes	AB	4	2
UHAB3042 Writing for Specific Purposes	AB	4	
UHAB3052 Effective Oral Communication Skills	AB	4	
b. Personal Development			
UICI2112 Introduction to Muamalat	FTI	4	
UICI2092 Property Planning and Management	FTI	4	
UICI2082 Family Management	FTI	4	
UICI2102 Biopsychosocial- Spritual	FTI	4	
UICI2122 Philosophy of Islamic Art	FTI	4	
UICI2122 Islamic Institutions	FTI	4	
UICI2062 Science and Philosophy of Prayers	FTI	4	
UICI2052 Al-Quran and Human Civilization	FTI	4	
UPPR2002 Healthy Living	FP	4	
UPPR2012 Total Fitness	FP	4	
UHAS2032 Technocrat and Development	FPPSM	4	
UHAS2042 Introduction to Industrial Sociology	FPPSM	4	
UHAS2052 Effective Communication	FPPSM	4	
UHAS2092 Professional Ethics	FPPSM	4	2
UHAS2102 Industry Counselling	FPPSM	4	

	Course Cluster / List of Courses	Offering Faculty[1]	Status[1]	Required Credit
	UHAS2142 Leadership in Organisations	FPPSM	4	
	UHAS2132 Managerial Communication Skill	FPPSM	4	
	UKPU2112 Energy Security	FPREE	4	
c.	**Globalisation**			
	UICI2072 Introduction to Comparative Religion	FTI	4	
	UCIT2032 Islam and Current Issues	FTI	4	
	UKAA2022 Sustainable and Communities Development	FKA	4	
	UHAS2162 Intercultural Management	FPPSM	4	
	UHAS2112 International Relations	FPPSM	4	
	ULAC2112 Basic Mandarin	AB	4	
	ULAF2112 Basic French	AB	4	
	ULAJ2122 Basic Japanese	AB	4	
	ULAM1112 Malay Language for Communication	AB	3	
4.	**Co-curriculum**			**2**
	There are a wide variety of co-curriculum courses available; students are advised to refer to the course descriptions published by the Centre for General Courses and Co-Curriculum (CGCC).	CGCC	2	

Offering Faculty:

FKA	Faculty of Civil Engineering	http://www.civil.utm.my/
FP	Faculty of Education	http://www.fp.utm.my/
FPPSM	Faculty of Management and Human Resources Development	http://www.fppsm.utm.my/
FPREE	Faculty of Petroleum and Renewable Energy Engineering	http://www.utm.my/petroleum/
FSKSM	Faculty of Computer Science and Information System	http://webs.cs.utm.my/
FTI	Faculty of Islamic Civilization	http://www.islamic-civilization.utm.my/
AB	Language Academy	http://www.language-academy.utm.my/
CGCC	Centre for General Courses and Co-Curriculum	http://web.utm.my/kokurikulum/
CSI	Centre for Student Innovation	http://www.utm.my/csi/

Status:

1 Compulsory general courses for all students.
2 Compulsory general courses for local students.
3 Compulsory general courses for international students.
4 Elective general courses.
5 Elective general courses with pre-requisite. Please consult the offering faculty or centre for further detail.

Syllabus Synopses

Due to the large number of elective general courses now being offered by various faculties and centres, the synopses below consists only of compulsory and elective general courses commonly enrolled by in the past semesters. Synopses of courses that are not listed can be obtained by contacting the appropriate faculty or centre. Students are strongly advised to consult their academic advisers before deciding to enrol in any of elective general courses not listed in their curriculum.

Nationalism and Civilization Cluster

UICI1012 Islamic and Asian Civilisation

The course familiarises students with the Islamic and Asian Civilisation. It discusses the science of civilisation that embraces an introduction to the science of civilisation, the interactions of various civilisations (Malay, Chinese and Indian); Islam in Malay Civilisation, and its role in establishing the Malaysian civilisation, contemporary issues on Islamic and Asian Civilisation and nation-building. At the end of the course, students will be extensively exposed to the history, principles, values and fundamental aspects of civilisation studies in Malaysia and able to strengthen the integrity of Malaysian as citizens of a multi-racial country with a high level of tolerance towards others. Throughout the learning process, some aspects of generic skills namely team working, communication skills and ethics will be emphasised.

UICI2022 Science, Technology and Mankind

The course discusses the philosophy of knowledge in terms of its definitions, concepts, theories, history, culture, knowledge, and transfer of knowledge. Science in terms of its concepts, history, cosmology, and Islamic view of learning science, methodology of Islamic science, the comparisons between Islamic science and western science, as well as modern science and the divine will be discussed. Technology in terms of its concepts, historical development, solutions to technology issues, and technology and divinity will be touched upon. This course will also discuss about the human; the concept and theory, the creation of man, the human role, stages of human life, the glory factors, ethics, values, and purpose of human creation.

UHAS1172 Malaysian Dynamics

This course covers a variety of social science disciplines including sociology, political science, history and international relations. This course will add to students development of self-esteem, foster unity among students, and produce dynamic students with global thinking capabilities.

UHAS1162 Arts, Customs and Beliefs of Malaysian

This course is designed for first year international undergraduates from countries of non-Malay origin. Students will be exposed to various aspects of the Malaysian culture such as the belief system, religious festivals, customs and etiquette of different racial groups in Malaysia. Students will also be introduced to Malaysian traditional music, arts and crafts.

Innovation, Creativity and Entrepreneurship Cluster

Innovation and Creativity

UHAS2122 Critical and Creative Thinking

The aim of the course is to develop students' understanding of the concept, theory and practice of critical and creative thinking. Attention is on critical and creative thinking techniques, and obstacles to both thinking methods. Both thinking methods help students to make decisions or solve problems either in groups or individually.

Entrepreneurship

UHAS3102 Entrepreneurship and Enterprise Development

This course is designed to expose students to the concept of entrepreneurship and entrepreneurs and the skills needed to prepare a good business plan. In addition to exposing students to the characteristics of successful entrepreneurs, various skills to successfully run and manage entrepreneurial ventures, techniques of identifying, evaluating and choosing business opportunities, procedures to form a business, planning, funding and business supports available in Malaysia will also be discussed. Finally, students will be guided to prepare a business plan (following a chosen model). In general, the focus is on instilling entrepreneurial features among the students and developing the required skills to manage a business enterprise.

Personal and Society Development and Globalisation Cluster

Communication

UHAB1412 English for Academic Communication

This course prepares students for the skills needed to perform academic tasks, such as taking notes from written and oral texts, producing academic assignments and giving oral presentations related to their academic assignments. It will emphasise on various skills such as looking for information from different sources (print, Internet, etc.) extracting information from different text types, making notes of information obtained, expanding notes into coherent extended texts and presenting information as well as giving viewpoints in an oral presentation. At the end of the course, students should be able to apply the skills in an academic setting when communicating in both oral and written discourse.

UHAB2422 Advanced English for Academic Communication

This subject prepares students for advanced academic communication in English with emphasis on oral communication skills. Students will be assigned projects that require them to look for and extract relevant information from various sources. In the process of completing the projects assigned, students will put into practice various skills developed in the earlier subject as well as skills in collecting data through interviews and questionnaire survey, integrating and presenting information (in oral and written form), time management and group interaction. The various oral activities such as presenting a proposal of the project, giving a briefing on the progress of the report and presenting the completed report are designed to build students' oral communication skills and confidence in expressing themselves.

UHAB3012 English for Career Search

The course prepares students to learn more about their respective field of work. This is done through projects on job hunting and career search which require them to research on information related to their future profession. Through the sharing of information, students will be better informed of what their future profession entails. This component is followed by a component on writing effective curriculum vitae and persuasive job application letters using appropriate language and tone. Students will also have the opportunity to practice skills for effective job interviews.

UHAB3022 English for Workplace Communication

The course aims to introduce and expose students to the basic principles of communication at the workplace. This includes appreciating the importance of the four language skills, i.e. listening, reading,

speaking and writing in effective workplace communication. In the course, students will have the opportunity to practice effective meeting and discussion skills in formal and informal communicative events and read and write appropriate workplace related documents. Students will also be exposed to situations where they learn to function as individuals and team members and interact verbally and nonverbally with appropriate language, style and gestures.

UHAB3032 Reading for Specific Purposes

The aim of this course is to introduce students to texts of different genres and rhetorical structures, namely, literature and science-based texts. Students are taught to deal with two main areas of reading: reading for academic purposes and reading to appreciate literary texts. In reading for academic purposes, students are exposed to authentic texts drawn from journals, research articles and magazines. They are taught how to discuss and respond critically to issues related to the texts. They are required to extract holistic ideas of the theme and react to them by stating agreement or disagreement, advantages or disadvantages of the ideas stated and make inferential opinion and justification. In appreciating literary texts, students are taught to analyse some literary texts. They are also required to share their own experience, perceptions, and opinions to issues presented in the literary texts. In both reading for academic purpose and literary appreciation, the texts serve as stimulus and context for language learning.

UHAB3042 Writing for Specific Purposes

The course focuses on the writing of technical information that students would be expected to perform in their professional career. Students will be introduced to the techniques of gathering technical information about products, services or work related information using letters, memorandums, e-mails and facsimile for the purpose of writing reports to a target audience for a specific purpose. In addition, students will be exposed to proper language usage and acceptable writing standards.

UHAB3052 Effective Oral Communication Skills

The course focuses on the techniques of producing good spoken discourses (to include oral presentation, speech and briefing) using the English sound and speech systems. Aspects of sound production and speech production aim at improving intelligibility and communicability will be covered. It will also incorporate aspects of confidence building, visual aids preparation and audience handling. Participants will have substantial practice in speech delivery.

Personal Development

UCIT2122 Islamic Institutions

The course exposes students to the comprehensiveness of Islam via its distinctive institutions. It discusses various institutions including the family, social integration, education, economy, legislative and jurisdiction, enforcement and politics. The discussions will focus on the concepts of the family; its internalising and implementation, the concept of society and the social responsibility, Islamic philosophy and educational system, concepts of Islamic economics, insurance and banking, the concept and characteristics of law and legislation, the position of Islamic law in the Malaysian constitution, witness, allegation, evidence and demonstration, wilayah al-Qadha', wilayah al-Hisbah and al-Masalim, and the concepts of Islamic politics and its dominion. At the end of the course, students are able to understand the concepts and roles of various Islamic institutions which can be an alternative solution to overcome the problem of Ummah. Students are also able to work in teams and be equipped with communication and problem solving skills.

UHAS2032 Technocrat and Development

This course focuses on the technocrats' roles and responsibilities toward the national development process. This course includes topics on sociology, economics, politics, technology, professional ethics and globalisation issues from various perspectives.

UHAS2042 Introduction to Industrial Sociology

The aim of this course is to discuss industrial aspects according to sociological perspectives. It focuses on the role of industrial sociology, industrial development and implication towards society and family. It also discusses employees' rights under respective laws and the union functions in industrial relations.

UHAS2052 Effective Communication

This course focuses on effective communication techniques. These include verbal and non verbal communication, interpersonal communication, public speaking, conflict management and problem solving.

UHAS2092 Professional Ethics

This course consists of basic debates on ethics (morale), ethics theories, ethics awareness, ethics principles and functions, ethics relations with professionalism, ethics problem in profession, value and

structure of professional ethics, service obligation, obligation towards clients, obligation towards the profession, current issues in management, medicine engineering and business.

Globalisation

UCIT2032 Islam and Current Issues

The course acquaints students with various topics on current issues and the Islamic approaches to overcome the problems and to encounter the challenges. The topics comprise discussions on globalisation, clash of Eastern and Western civilisations, moral decadence, ethical issues in science and technology, economic issues, development and environmental issues, post-modernism, governance and administration, issues that challenge the credibility of Islam, as well as fundamentalism and extremism. Issues pertaining to the ethnic relations and ethnic chauvinism and the current challenges of Muslim people will also be discussed. At the end of the course, students will be able to explain the Islamic views pertaining to current issues and provide answers and alternatives to the problems by referring to the Islamic principles. Students are also able to work in teams and be equipped with communication and problem solving skills.

UHAS2112 International Relations

The aim of this course is to explain the development of international relations. This course will also discuss thematic issues such as economics and international trade, laws, military, human rights, Islam and International Relation, globalisation and New World Order.

ULAC2112 Basic Mandarin

This subject introduces the four basic skills that include reading, speaking, listening and writing in both roman (han yu pin yin) and Chinese orthographic systems. The aim of this course is the acquisition of Mandarin at elementary level.

ULAF1112 Basic French

This course introduces the speaking, listening, reading and writing skills in French. Students are also briefly exposed to French culture.

ULAJ1112 Basic Japanese

Basic Japanese is designed to equip students with basic Japanese language skills. It adopts the communicative approach using the Y3K formula that combines the reading (Yomi), writing (Kaki), listening (Kiku) and speaking (Kaiwa) skills. Each lesson focuses on Y3K in which students are exposed to the Japanese language in communication.

ULAM1112 Malay Language for Communication

This course is designed for first year international undergraduates from countries of non-Malay origins. It is focused on the communication aspects in order to help students in the teaching and learning process. The oral aspects of the communication will be emphasised to encourage the students to be effectively involved in social interaction.

Minor Programmes

Undergraduate minor degree programmes are academic programmes approved by the University Senate offered by faculties in UTM to provide added value of interdisciplinary knowledge and skills to students. Minor programmes contain selection of courses from listed groupings, with a minimum total credit ranging between 15 to 21 units. The list of course groupings for a particular minor programme is determined by the programme owner and the participating faculties, based on the relevant existing curriculum from related bachelor degree programmes of the faculties.

The minor programme provides an avenue for students to be exposed to other fields on a small scale without being saddled with burdensome requirements apart from those required by the bachelor degree programme attended. Supplementary knowledge and expertise of more than one field will facilitate the graduate to be more flexible and competitive in facing the job market. Minor programmes offered by UTM (participated by FAB) are listed below. Specific course lists and programme requirements can be obtained from the Guidelines on the Implementation of Minor Programme (Garispanduan Perlaksanaan Program Minor).

List of Inter-Faculty Minor Programmes

Minor Programme	Credit	Program Owner	Participating Faculties	Participating FAB Programmes				
				SBEA	SBEQ	SBEP	SPBL	SBEC
1. Environment	15	FKA	FKK, FS, FGHT, FBB, FAB	✓		✓	✓	✓
2. Sustainable Urbanism	15	FAB	FGHT, FP, FS, FKA	✓	✓	✓	✓	✓
3. Energy	15	FPREE	FKM, FKE, FAB	✓				
4. Sustainability	15	FS	FAB, FKE, FKM, FBB	✓	✓			

Minor Programme	Credit	Program Owner	Participating Faculties	Participating FAB Programmes				
				SBEA	SBEQ	SBEP	SPBL	SBEC
5. Communication	15	LA	FPPSM, FAB	✓	✓		✓	✓
6. Education	16	FP	FAB, FGHT, FKA, FSKSM	✓	✓	✓	✓	
7. Creative & Innovative Design	17	FKM	FAB	✓				
8. Safety & Health	17	FKK	FPPSM, FGHT, FKA, FKM, FBB, FS, FAB					✓
9. Project Management	15	FGHT	FPPSM, FKA, FPREE, FAB	✓	✓	✓	✓	✓
10. Real Estate	15	FGHT	FKA, FAB	✓	✓	✓	✓	
11. Psychology	TBA	FPPSM	FP, FTI, FAB	✓				
12. Civic & Community Engagement	TBA	CGCC	FPPSM, FAB, FTI, FP	✓				✓
13. Construction Management	TBA	FKA	FGHT, FAB	✓	✓		✓	✓
14. Geo Spatial Technology	15	FGHT	FAB	✓	✓	✓	✓	

Qualification Requirement

15. UTM students can apply to enrol in a particular Minor programme offered based on the requirements and rules stipulated by the University.

16. Students may enrol in a Minor programme starting from semester FOUR (4) of studies

17. Students interested to enrol in a Minor programme must obtain a Good Standing (KB) with a CGPA exceeding 3.0 on the date of application and on the date of registration for a particular Minor programme. Only qualified students can apply to enrol in a particular Minor programme as determined by the Faculty offering the programme.

18. Students are not encouraged to follow a Minor programme which is very similar to the students' Bachelor Degree, pending the requirements stipulated by the Faculty.

Curriculum and Conferment Requirements

19. Students may double count attained credits from their Bachelor Degree up to 50% or stated of intended Minor credits requirement.

20. Enrolment in a particular Minor programme will neither change the curriculum nor the Course Total Pass Credit for a particular Bachelor Degree programme attended. Failure in courses for a particular Minor programme attended does not go against the stipulations and requirements of a Bachelor Degree conferment. Students can apply to be conferred a Bachelor Degree even if the passing requirements of the Minor programme is not fulfilled.

21. Minor Program requirements may vary from one program to another.

22. Students who would like to be conferred a particular Minor programme must complete all the stipulated pass credits of the Minor programme as well as all the pass credits of the Bachelor Degree Course attended within the stipulated duration of the Bachelor Degree studies.

23. Courses which the students have passed in the Minor programme will be noted in the students' results transcript in the semester in which it was taken together with the grades obtained. Results of the minor course will be taken into account in the CGPA and GPA calculation of that particular semester.

Enrolment in More than One Minor Programme

24. Students who are qualified can apply to enrol in MORE than ONE (1) Minor programme.

25. Students are not allowed to change the Minor programmes registered for.

Academic Advising

Academic advising is a process that encompasses the development and delivery of accurate, up-to-date information regarding the academic programme, courses, resources, policies, procedures and career options to aid students in pursuing their academic and career goals. All students are assigned an academic advisor for the following purposes:

1. To assist students in understanding university policies, procedures and regulations.

2. To provide information on academic programmes, institutional support services and resources.

3. To assist students in planning, monitoring and evaluating their educational plan towards degree completion and developing decision-making skills.

4. To assist students in determining their career goals.

5. To assist students in developing their intellectual, personal and social development.

Students are encouraged to seek guidance from their academic advisors and to regard them as mentors. Students **MUST** meet with their academic advisor at least once each semester in order to review their academic performance, course schedule and "be cleared" for registration. A beneficial advisor/advisee relationship should develop far beyond this meeting.

Academic Year

The University Academic Year is divided into two regular semesters, namely Semester I and Semester II. Each semester consists of 14 weeks of lectures, as shown in table below. The University also offers a short semester between the academic year however; short semester is not included in the calculation of duration of study.

Activities	Duration (Weeks)	Total Duration (Weeks)
Semester I		
Semester I Lectures (Part One)	7 weeks	
Mid-semester Break	1 week	
Semester I Lectures (Part Two)	7 weeks	19
Revision Week	1 week	
Final Examination	3 weeks	
Break Between Semesters		4
Semester II		
Semester II Lectures (Part One)	7 weeks	
Mid-semester Break	1 week	
Semester II Lectures (Part Two)	7 weeks	19
Revision Week	1 week	
Final Examination	3 weeks	
Long Semester Break	10 weeks	
Or		
End of Semester Break	1 week	10
Semester III (Short Semester)		
Teaching & Learning Activities	8 weeks	
Assessment/Examination	1 week	
	TOTAL	**52**

The academic calendar is the official calendar for the university and includes the official dates of its terms, deadlines for enrolment services and registration transactions, and holidays. The calendar gives a general idea of the academic year and is available on the following website: https://aimsweb.utm.my/

Programme and Course Registration

Detailed information on programme and course registrations is available in the UTM Academic Regulations at https://aimsweb.utm.my/pengumuman/Peraturan%20Akademik%20BI.pdf.

If you face problem pertaining to programme or course registration, please consult your head of programme or academic advisor immediately.

Program Registration

1. Students must register for the program offered on the date stated by the university.

2. Students who do not abide by (1) above without a valid reason accepted by the university, the offer will be automatically withdrawn.

3. Automatic registration of the program will be done by the university administration for senior students based on the previous semester examinations results.

4. Senior students with deferred status or are suspended must re-register for the program again. If the students do not register for the program within the time given, the students' study will be terminated.

5. Students who have not registered for the programme are not allowed to register for courses.

Course Registration

6. Students who have registered for a programme for the academic session must register for all the courses to be taken in that semester.

7. Students can only register for the courses offered in a semester according to the terms and conditions set by the student's faculty. Students cannot register for courses that are not offered in the semester.

8. Every course taken in the semester must be registered correctly by stating the course code, section number, number of course credits and the status such as Replacement Course (RC)[UM] , Replacement Grade (RG)[UG], Audit Course (AC)[HS], Compulsory Audit Course (CAC)[HW] or Minor Course (MC)[MN].

9. Mistakes made during registration of a course may result in students be given zero (0) mark for the course.

10. Any course repeated by a student (except for students who are Re-admission (RA)[DS] must be registered as Replacement Course (RC)[UM] or Replacement Grade (RG)[UG]. The course will be classified as follows:

    i) Replacement Course (RC)[UM] is a repeat of a failed course from the previous semester;

    ii) Replacement Grade (RG)[UG] is a repeat of a passed course with (grade B- and below) aimed at improving the academic performance and with the permission of the faculty. A fee of RM 50.00 will be charged for every credit and refunds will not be given if the student withdraws from the course.

11. The previous course code must be used for registration purposes as in paragraph 5.0.

12. Courses taken by Re-admission (RA)[DS] students cannot be registered as Replacement Course (RC)[UM] or Replacement Grade (RG)[UG].

13. Course Registration can be done online or using the Course Registration Form (Form UTM.E/3.1 Amendment 2010). Students are advised to discuss with their Academic Advisors before registering for the courses.

14. Students are encouraged to pre-register their courses by using the online or other facilities within the registration period given by the university.

15. Compulsory course registration will be conducted over a period of two (2) working days during the last week before the semester begins according to the date determined by the university. Registration after this period is restricted to the last working day of the first week[2] of the semester and will include a fine of RM50.00. Course registration after this period of time will not be allowed unless permission is obtained from the faculty.

16. Students may make amendments to the previous registration during the first week of the semester. Any changes in the registration made in the second week will incur a fine of RM50.00 per course up to a maximum of RM300.00. The amendments include insertion, deletion, change of code and status of courses by using the Registration Slip Amendment Form (Borang UTM.E/3.5 Pindaan 2010).

17. Students should print the course registration slip and check to ensure that the information in the slip is accurate. Students should make the necessary amendments based on the rules, conditions and time given as stated in paragraphs 10 and 11.

18. The official registration slip will be issued to every student by the faculty in week ELEVEN (11). Student's Faculty should obtain the slip from their faculty and to bring it when they sit for their final examinations.

19. Students may withdraw (CW)[TD] from any of the courses registered in the semester. The application to withdraw (CW)[TD] is by using the Course Withdrawal Form (Form UTM.E/3.2 Amendment 2010) beginning week THREE (3) until the last working day of week NINE (9) in the semester. Request for withdrawals after this date will not be allowed.

20. The course registration process shall be done according to the procedures set by the university. Registrations which are not done according to the procedures will be rejected or not be considered.

21. If a student fails to register for the course within the time stipulated unless valid reasons are presented and accepted by the university, the student's study will be terminated.

[2] Please refer to the academic calendar at http://web.utm.my/currentstudent

Grading and Point Value System

Grading System

Students' achievement in any particular course is reflected in the grade obtained. The relationship between marks, grade and point value is shown in the table below:

Marks	Grade	Point Value
90-100	A+	4.00
80-89	A	4.00
75-79	A-	3.67
70-74	B+	3.33
65-69	B	3.00
60-64	B-	2.67
55-59	C+	2.33
50-54	C	2.00
45-49	C-	1.67
40-44	D+	1.33
35-39	D	1.00
30-34	D-	0.67
00-29	E	0.00

The passing grade for any course is set by the Faculty upon the Senate's approval. Generally, the minimum passing grade, **except for studio courses**, is D+. The minimum passing grade for studio courses in the Architecture, Town & Regional Planning, and Landscape Architecture programmes is C.

Students will be graded for most of the courses according to the above grading system. However, there are some courses, particularly those registered with a HW status, which are without grades. For these non-graded courses, students will obtain a 'HL' (Pass) or 'HG' (Fail) status. Non-graded courses earn credit toward a degree but not grade points.

Academic Standing

The students' academic standing is based on Cumulative Grade Point Average (CGPA) and Grade Point Average (GPA). CGPA is a calculation of the average of all of a student's grades for all semesters and courses completed up to a given semester, whereas GPA is a calculation of the average of a student's grade for only the one particular semester. Each grade is changed to point based on the formulation below:

$$\text{Point} = \text{Course Credit} \times \text{Point Value}$$

$$\text{GPA} = \frac{\text{Total points}}{\text{Total credit units for the particular semester (graded courses)}}$$

$$\text{CGPA} = \frac{\text{Total points for all semesters taken to date}}{\text{Total credits accumulated for all semesters taken to date (graded courses)}}$$

A student's academic standing is determined at the end of every regular semester based on CGPA as shown in the table below.

CGPA	Academic Standing
CGPA > 2.00	Good Standing (KB)
1.70 ≤ CGPA < 2.00	Probationary Standing (KS)
CGPA < 1.70	Failure Standing/Academic Dismissal (KG)

A student with Probationary Standing (KS) for three consecutive semesters will be given Failure Standing (KG) and will be dismissed from the academic programme. Those with a GPA < 1.00 but a CGPA ≥ 1.70 will face one of the following three options:

1. Allowed to continue his/her study; or
2. Suspended in the following semester; or
3. Dismissed from the academic programme.

GPA/CGPA Computation

The method of computing the GPA in one particular semester with six graded-courses and one non-graded course (course registered with a compulsory audit course [HW] status) is as shown below:

$$\text{Point} = \text{Course Credit} \times \text{Point Value}$$

$$\text{GPA} = \frac{\text{Total points}}{\text{Total credit units for the particular semester (graded courses)}}$$

Courses	Credit units	Marks	Grade	Grade point	Point
Course A	4	91	A+	4.00	16.00
Course B	5	84	A	4.00	20.00
Course C	5	66	B	3.00	15.00
Course D	4	56	C+	2.33	9.32
Course E	2	25	E	0.00	0.00
Course F	3	-	HL	-	-
Total credit units enrolled	23				
Total credit units from graded courses	20			Total Points	61.32
Less credit units of failed Course (Course E)	2				
Total credit units earned for the semester	21				

$$\text{GPA} = \frac{\text{Total points}}{\text{Total credit units for the particular semester (graded courses)}}$$

$$= \frac{16+20+15+9.32+0}{20}$$

$$= 3.02$$

To calculate your CGPA, total the credit hours and then the grade points from all semesters. Divide the total grade points by the total credit hours.

Special Programmes for Undergraduates

UTM Professional Skills Certificate

The UTM Professional Skills Certificate programme is the university's capacity building initiative to equip students with useful skills and experiences that will enhance their employment opportunities. Students are required to earn the certificate as part of the requirements for graduation.

To earn the UTM Professional Skills Certificate, students are required to enrol and complete five (5) short courses throughout their studies. The five short courses are as follows:

1. ISO 9001:2008 Quality Management System Requirement – managed by UTMSPACE
2. Occupational Safety and Health Awareness (OSHA) – managed by UTMSPACE
3. How to Manage Your Personal Finance – managed by UTMSPACE
4. How to Get Yourself Employed (HTGYE) – offered by the respective faculties and managed by Office of Undergraduate Studies
5. Test of English Communication Skills for Graduating Students (TECS) – managed by Language Academy

The short courses under The UTM Professional Skills Certificate programme are conducted on weekends i.e. Saturday and Sunday except for TECS where it is conducted on Wednesday. TECS and HTGYE are usually taken by students in their final year, while the other three short courses can be taken at any time during the study.

Students enrolled in the above short courses will be charged a fee of RM200.00. However, for sponsored students, the amount will be deducted from the scholarships/loans at the beginning of the semester.

For additional information on the short courses managed by UTMSPACE and Language Academy, please visit the respective website at http://www.utmspace.edu.my/utmpp/ and http://languageacademy.utm.my/tests-info/tecs

Cross-Campus Programmes

Purpose

The purpose of the cross-campus programme is to provide opportunities for local university undergraduate students to gain experience and transfer of credit by pursuing their studies at another university apart from their own universities. Through this programme, it is hoped that the link between local universities will be strengthened and the exchange of ideas facilitated.

Universities Involved

This programme involves all public universities in Malaysia. Four universities will spearhead the programme. The universities involved are Universiti Sains Malaysia, Universiti Teknologi Malaysia, Universiti Malaya and Universiti Malaysia Sarawak.

Student Selection and Programme Implementation

Student selection criteria are as follows:-

1. This programme is opened to registered students at the First Degree level who have completed at least two (2) semesters of studies.

2. Students are not the resident of/do not originate from the state in which the host university resides.

3. Students must obtain a minimum CGPA of 3.00 at the time of application. The total credit allowed to be taken is between 12 and 16 credits only. Implementation of the programme is during the Semester II of each academic session.

4. Students selected will participate in the programme for one semester and students must return to their respective universities after the said studies.

Funding

It is proposed that each university involved should agree to the following:-

1. Students will pay fees at the initial university and will not be charged at the host university.

2. The host university must provide accommodation facilities on campus for students from other universities.

3. Students involved are permitted to use health services at the host university like those provided to other students.

4. Other costs will be borne by the students. However, as an incentive, each university might want to consider monetary assistance to those students involved.

UTM Global Outreach Programme

Participating in the UTM Global Outreach Programme is an exciting and challenging way of broadening students' personal, academic and professional horizons. In this programme, students spend one to two weeks to gain new academic, cultural and international experience.

Through the UTM Global Outreach programme students are able to:

- Globalise their educational experience by adding an international dimension to their degree;
- Enhance academic opportunities beyond those offered at UTM;
- Establish professional and career opportunities by networking with other students, academics and professional organisations;
- Improve language skills, cross-cultural understanding, and cross-cultural and interpersonal communication
- Experience personal growth by developing self confidence, independence, and social skills; and
- Incorporate these new experiences into your resume so that students stand out from the crowd in an ever increasingly global workforce.

Organising a Global Outreach Programme requires careful planning as well as financing to pay for expenses including travel costs and fares, accommodation, insurance and meals. Although, the university offers some financial assistance but students are encourage to develop their own creative fundraising activities to help finance the programme. Advanced planning is essential in preparation for the Global Outreach programme.

The UTM Global Outreach Programme is coordinated by the faculty in collaboration with UTM Office of International Affairs. Consult the respective head of programme for more information on this programme.

Postgraduate Programmes

In recent years postgraduate programmes are becoming an integral part of the Faculty of Built Environment. Altogether there are thirteen postgraduate programmes at the faculty of which nine are at the Master level and the rest at the Doctor of Philosophy (PhD) level. Five of the programmes are taught course programmes and these are the master programmes and the other programmes are research programme.

Master Programmes

The master programmes at the faculty are offered in both taught course and research modes. Taught course programmes require the students to enrol and pass a series of courses as the undergraduate studies while research programmes require the students to carry out an original research and report the findings in the form of a thesis.

Master programmes in research mode are:

- Master of Architecture
- Master of Science (Quantity Surveying)
- Master of Science (Urban & Regional Planning)
- Master of Science (Transport Planning)

Areas of research conducted by master students are cross-listed in the section on PhD programmes below.

Master programmes in taught course mode are:

- Master of Architecture
- Master of Science (Urban & Regional Planning)
- Master of Science (Construction Contract Management)
- Master of Science (Transport Planning)
- Master of Science (Tourism Planning)

Following are descriptions of the programmes.

Master of Architecture

Please refer to page 37 of the Guidebook

Master of Science (Urban and Regional Planning)

Introduction

This taught course programme covers all the core spatial planning subjects that are important to planning practice, research, technical and soft skill required to be a competent and innovative urban and regional planner. Students are taught to understand and appreciate social, economic and political processes that shape cities and regions, and ways in which public policy can improve the quality of life. Ideas and concepts such as sustainability, urban governance, and regional economic development form the basis of the courses in the programme.

Programme Objectives

The objectives of this programme are:

- To improve the quality of planning and development at urban and regional level.
- To provide students with an opportunity to examine range of issues on sustainable development, regional planning and urban management.
- To improve the standard of professionalism in the field of urban and regional planning.

Course Content

- University Subject
- Planning Theory & Principles
- Land Use Planning
- Social & Community Planning
- Planning Law and Practice
- Finance & Urban Management
- Urban Design
- Quantitative Research Methods
- Transportation, Utility and Infrastructure Planning
- Environmental Resource Planning
- Elective course
- Planning studios
- Master's Project
- Industrial training

Mode of Study

The programme is conducted in full-time taught course mode only. The duration of this course is 3 semesters (minimum) and a total of 50 credits is required to complete the programme.

List of Courses by Semester

Semester 1 (16/19 credits) • Planning Theory and Principles • Land Use Planning • Quantitative Research Methods • Basic/Local Plan Studio • Social and Community Planning • University subject*	**Semester 2 (16/19 credits)** • Planning Law and Practice • Finance & Urban Management • Transportation, Utility and Infrastructure Planning • Structure Plan Studio (Strategic Planning) • Elective course • University subject*
Short Semester • Industrial Training	**Semester 3 (15 credits)** • Urban Design • Environmental Resource Planning • Feasibility Studio (Design/Finance studio) • Master Project

***Register for one (1) only**

Contact Person(s)

Assoc. Prof. Dr. Foziah Johar
Tel: +607-5537357
Fax: +607 5566155
Email: b-foziah@utm.my

Master of Science (Construction Contract Management)

Introduction

The programme is designed based on the conception that: “a project manager or contract manager” will be more adept in evaluating and selecting a contracting system that is most appropriate to the requirements of the work and conforming to the economic, legal, cost, time and quality requirements and managing it efficiently and effectively, if they are very knowledgeable in the principles and philosophy of construction law and operational aspects of the various project procurement and contracting systems”

Programme Objective

It is a post-graduate programme to cater for graduates and professionals who are seeking greater knowledge and experience and wishing to broaden their careers into the specialised field of construction contract management.

Course Content

- University Subject
- Project Development Economics
- Construction Project Management
- Law of Contract, Tort, & Sales of Goods
- Land, Planning & Environmental Law
- Construction Environment
- Construction Project Development
- Case Studies
- Construction Procurement and Contract
- Management Information System
- Construction Contract Study
- Dispute Resolution and Professional Liability
- Statistics and Operational Research
- Master Research Project (Dissertation)
- Seminar

Mode of Study

The programme offers 3 modes of study:

- Full Time (Perdana) in Johor campus.
- Part-time (Perdana) in Johor campus.
- Part-time (Pesisir) in Kuala Lumpur and Kuching, Sarawak.

A total of 40 credit hours is required to complete the programme.

List of Courses by Semester

Semester 1:	**Semester 2:**
• Construction Economics • Project Management & Operational Research • Law of Contract, Tort, Agency & Sales of Goods • Land, Planning & Environmental Law • Case Studies • Construction Environment** • Construction Project Development** • University subject ** Elective subjects for students who possess LLB degree only	• Construction Project Procurement • Arbitration • Alternative Dispute Resolutions & Adjudication • Construction Contract Studies 1 • Construction Contract Studies 2 • University subject
Short Semester : • Master Project	

Contact Person(s)

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Master of Science (Transport Planning)

Introduction

Proper movement of goods and people are essential to the country's development. For a developing country, the need for high quality transport and infrastructure facilities is vital to cater for both urban and rural development. The right policy and workable planning and engineering inputs are therefore very pertinent to the developing countries. To enhance professional understanding of the link between transport services, land use and economic development, the Department of Urban and Regional Planning is offering a M.Sc. course in Transport Planning tailored to the needs of developing nations. The course is

recognised by The Chartered Institute of Logistics and Transportation (CILT) and The Chartered Institute of Transport (United Kingdom).

Programme Objective

The course analyses the transport situation and the related policies and strategies in cities of both developed and developing countries. It examines current urban transport problems, the needs for movement and access, the existing systems of transport and the experiences of the public and private sectors in providing transport facilities. Both traffic management and road design requirements for the developing countries are emphasied.

Course Content

- Analytical Methods and Optimization
- Logistics Systems
- Sustainable Transportation
- University Subject
- Transportation Systems and Policies
- Logistics Engineering and Management
- Dissertation I
- Dissertation II
- Dissertation III

Mode of Study

A total of 40 credit hours is required to complete the programme. The programme is run in mixed mode format whereby fifty percents (50%) of the credits are obtained through taught courses while the remaining 50% are obtained through research.

List of Courses by Semester

Semester 1: • Analytical Methods and Optimization • Logistics Systems • Sustainable Transportation • Dissertation I	**Semester 2:** • Transportation Systems and Policies • Logistics Engineering and Management • University subject • Dissertation II
Short Semester : • Dissertation III	

Contact Person(s)

Dr. Muhammad Zaly Shah Muhammad Hussein
Tel: +607 5537452
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Email: zaly@live.utm.my

Master of Science (Tourism Planning)

Introduction

Jointly conducted by the Department of Urban and Regional Planning and the Faculty of Management and Human Resource Development, the course adopts a flexible teaching approach to suit the needs of both fresh graduates as well as practitioners in producing skilled and highly trained tourism planners.

The teaching approach has evolved from its urban planning tradition since the inception of the course in 1998 to a multi-disciplinary and collaborative approach based on the principles of sustainability. A distinct feature of the course is 'hands on' learning through 'live' projects for clients such as UNESCO, The Ministry of Tourism, State agencies and local authorities. The course also covers the whole spectrum of tourism planning such as ecotourism, urban tourism, rural tourism, heritage tourism, island tourism, and sustainable tourism, etc.

Programme Objectives

The objectives of this programme are:

- To impart knowledge on the latest development in tourism planning theory, principles and techniques.
- To provide opportunities for education and research at the postgraduate level which seek to achieve a balance between academic excellence and the needs of the industry.
- To supply the job market with professionals in the field of tourism planning.

Course Content

- Tourism Planning
- Tourism Analysis
- Tourism Marketing
- University Subject
- Studio
- Research Methodology
- Tourism Product Planning
- Master's Dissertation

Mode of Study

This is a full-time mixed mode programme and is conducted over 3 semesters. A total of 41 credits are required to complete the programme.

List of Courses by Semester

Semester 1: • Tourism Planning • Tourism Management • Tourism Analysis • Dissertation I • University subject*	**Semester 2:** • Tourism Marketing • Studio • Dissertation II • University subject*
Short Semester : • Dissertation III	
***** Register for one (1) only	

Contact Person(s)

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Email: merang@utm.my, tprg_fab@yahoo.com

Doctor of Philosophy Programmes

In addition to the master programmes, the postgraduate programmes at the faculty also consist of four Doctor of Philosophy (PhD) programmes in architecture, quantity surveying, urban and regional planning, and transport planning. The programmes are entirely conducted in research mode whereby students conduct original research under the supervision of well-experienced supervisors who are themselves PhD holders. The duration of the programmes are three years at the minimum and six years maximum for full-time students while part-time students are allowed four years minimum and eight years maximum.

Students in the PhD programmes conduct research in a variety of areas of interest and these areas sometimes overlap with that in the Master Programme. Following are samples of areas of interest grouped according to programme.

Architecture

- Environmental Engineering & Architectural Sciences
- CAD
- Urban Design
- Architectural Management
- Architecture and Human Behaviour
- Architectural History & Theory
- Landscape Architecture
- Urban Greening
- Climatic Mapping
- Children's Environment
- Vertical Green System
- Vernacular Architecture
- Passive Architecture
- Landscape Resource Planning
- Landscape Ecology

Quantity Surveying

- Construction Economics and Cost Management
- Construction Technology and Management
- Construction Law and Contract
- ICT in Construction
- Building Information Modelling
- Dispute Resolution and Adjudication
- Life Cycle Costing
- Sustainable Construction
- Construction Health and Safety
- Plant and Site Management
- Cost Estimating
- Facilities Management
- Building Services

Urban and Regional Planning

- Rural Planning
- Tourism Planning
- Housing and Community Planning
- Regional Planning
- Geographic Information System
- Spatial Modelling
- Urban Morphology
- Spatial Analysis for Social Issues
- Remote Sensing Applications
- Environmental Planning
- Low Carbon Society/City
- Climate Change
- Urban Design
- Urban Development and Management

Transport Planning

- Public Transport Planning & Management
- Port Planning and Cargo Handling
- Regional Transportation Planning
- Transport and the Environment
- Transport Economic
- Logistics & Physical Distribution Management
- Traffic Engineering and Management
- Transportation Models
- Airport Planning Management
- Urban Transport and Modelling
- Transport Policy
- Highway Planning
- Freight Transport
- Public Transport Operations

Prospective Students

Undergraduate students from the faculty having completed their bachelor degrees and meet the requirements can continue their studies into a master programm. Following is a guide on what master programme that a student can pursue based on his/her undergraduate qualification.

Undergraduate Degree	Potential Master Programme
Bachelor of Architecture	Master of Architecture (Taught Course)
Bachelor of Landscape Architecture	Master of Architecture (By Research) Master of Science (Construction Contract Management) Master of Science (Urban and Regional Planning) (By Research)

Undergraduate Degree	Potential Master Programme
Bachelor of Quantity Surveying	Master of Science (Construction Contract Management) Master of Science (Quantity Surveying) (By Research)
Bachelor of Science in Construction	Master of Science (Construction Contract Management)
Bachelor of Urban and Regional Planning	Master of Science (Construction Contract Management) Master of Science (Urban and Regional Planning) (Taught Course) Master of Science (Urban and Regional Planning) (By Research)

Admission Requirements

Admission requirements vary slightly from programme to programme but the following are the requirements in general. Further details can be obtained from the contact person(s) listed for each programme and also from the faculty website.

General Admission Requirements for Masters Degree

- A Bachelor's degree with good honours from Universiti Teknologi Malaysia or any institutions of higher learning recognised by the Senate; or
- A qualification equivalent to a Bachelor's degree and experience in the relevant field recognised by the Senate.

General Admission Requirements for Doctoral Degree

- A Master's degree from Universiti Teknologi Malaysia or any institutions of higher learning recognised by the Senate; or
- Other qualifications equivalent to a Master's degree and experience in the relevant field recognised by the Senate; or
- Candidates who are currently registered in a Master's degree programme at Universiti Teknologi Malaysia, and approved by the Graduate Studies Committee of the respective faculty and the Senate

Further Information

Further inquiries on the postgraduate programmes at the faculty can be forwarded to:

Assoc. Prof. Dr. Rashid bin Embi
Head of Department (Postgraduate & Research)
Faculty of Built Environment
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Assoc. Prof. Mohammad Rafee bin Majid
Head of Department (Postgraduate & Research)
Faculty of Built Environment
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Tel: + (607) 553 0881/ 0604

Facilities

The faculty has various facilities to ensure that all academic programmes can be implemented effectively. Facilities available specifically in the faculty are as follows:

Lecture Halls and Classrooms

The faculty has 2 lecture theatres each with a capacity of 120 and 6 theatres each with a capacity of 100. For smaller groups, there are 2 classrooms that can seat 60 students. All lecture theatres and classrooms are fully air-conditioned and are equipped with up to date teaching and learning equipment. The faculty also has 10 small classrooms that can accommodate up to 30 students, which are suitable for a variety of teaching and learning activities.

Studios

The faculty has 25 dedicated studio spaces 12 for architecture students, 4 for planning students, 4 for landscape architecture students and 5 for quantity surveying and construction students. These studio facilities are based on the creative and practical nature of the programmes, emphasising personal exploration and development, and recognising the value of peer learning. The studios provide a flexible and vibrant working space where most of the teaching and learning on architecture, landscape architecture and planning programmes takes place. Students are encouraged to use the studios as a professional workplace. They can work on individual projects as well as use the space to meet and work collaboratively on projects.

Workshop

On the ground floor of Block BO5 is a multi-functional workshop with substantial equipment supporting the following processes and materials:

1. Woodworking
2. Metalworking
3. Fabrication
4. Welding
5. Model making
6. Sculptural processes
7. Materials testing

Students are provided with health and safety induction training prior to using the machinery. Laboratory technicians have offices within the workshop area and are available to provide support and necessary supervision to students.

Laboratories

The faculty's teaching and research activities are supported by 6 specialised laboratories: Building Science Laboratory, Urban Study Laboratory, Information Technology & Planning Laboratory, Environmental Science Laboratory, Landscape Laboratory and Logistics and Transportation Laboratory. These laboratories are equipped with a wide range of up to date equipment and facilities.

IT Facilities

The faculty has 10 computer laboratories with 400 computers for teaching and students' use. Networking and internet facilities with Wi-Fi access points are available throughout the faculty. The faculty also provides various specialised and general purpose software to assist students in the five different programmes of study.

Faculty Library

The faculty has its own mini library that is managed by trained personnel to provide students and staff with specific built environment references such as a collection of thesis, staff publications, reports, reference books and magazines. This facility is located at level 4 of Block BO5 and it is equipped with audio-visual equipment, printing and photocopying machines.