UTM
UNIVERSITI TEKNOLOGI MALAYSIA

2023/2024

UNDERGRADUATE ACADEMIC GUIDEBOOK

Faculty of Built Environment and Surveying

UNDERGRADUATE ACADEMIC GUIDEBOOK

Academic Year 2023/2024

Faculty of Built Environment and Surveying
Universiti Teknologi Malaysia

builtsurvey.utm.my

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 and Surveying.

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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UNIVERSITI TEKNOLOGI MALAYSIA

The University's Philosophy, Vision, Mission and Motto

Philosophy

The divine law of Allah is the foundation of knowledge. In line with His Will, UTM strives with total commitment to attain excellence in science, technology and engineering for the well-being and prosperity of mankind

Vision

A Premier University Providing World-Class Education and Research

Mission

To Develop Holistic Talents and Prosper Lives Through Knowledge and Innovative Technologies

Motto

In the Name of God for Mankind

Core Values

Integrity | Synergy | Excellence | Sustainability

FACULTY OF BUILT ENVIRONMENT AND SURVEYING

The Faculty's Vision, Mission, Theme and Core Values

Vision

To be the faculty of choice for education and professional development in built environment

Mission

We strive to develop professionals who are responsible towards shaping sustainable built environment through synergistic partnership with the industries, professional bodies and alumni

Theme

Professional Built Environment Education for Sustainable Development

Core Values

Creative | Progressive | Collaborative | Inclusive | Sensitive

1. Foreword by the Dean

Welcome to the Faculty of Built Environment and Surveying (FABU) at Universiti Teknologi Malaysia (UTM). This Guidebook contains valuable information regarding the academic programs offered by the Faculty.

The Faculty stands as one of the foremost institutions providing undergraduate and postgraduate programs in the Built Environment and Surveying field within Malaysia. It boasts a comprehensive array of undergraduate degree offerings encompassing Architecture, Urban and Regional Planning, Quantity Surveying, Landscape Architecture, Construction, Land Administration and Development, Geomatic Engineering, Geoinformatics, and Real Estate. These programs hold accreditation from various national and international professional bodies, affirming their quality. Both the undergraduate and postgraduate programs offered by the Faculty have earned strong reputations among employers, reflecting their well-established nature. Furthermore, the Faculty maintains robust connections with industry stakeholders, facilitating numerous successful careers for our students. Notably, the recent release of the QS World University Rankings by Subject has positioned the Faculty among the top 100 worldwide—a remarkable accomplishment for our institution.

The Faculty places a strong emphasis on amalgamating academic knowledge with the practical skills essential for professional proficiency. Beyond the conveyance of technical expertise, the acquisition of generic skills holds significant importance, equipping graduates to compete effectively in the job market and thrive in their future endeavors. Consequently, our courses comprehensively incorporate the development of these generic skills. As a testament to our commitment, the Faculty has consistently achieved one of the highest Graduate Employability rates within UTM, with our graduates often earning premium salaries in recognition of their exceptional qualifications and preparedness for the workforce.

In today's intricate and ever-evolving world, international exposure stands out as a crucial determinant of success. Hence, it is imperative for students to cultivate an understanding of foreign cultures and policies to broaden their awareness and gain insights into diverse facets of global issues and challenges. The prospect of gaining such exposure is seamlessly integrated into the University's academic framework through various internationalisation initiatives, including global outreach, overseas internships, service-learning, and summer school programs. Consequently, the Faculty strongly encourages its students to actively engage in at least one of these internationalisation programs during the course of their studies, ensuring they are well-prepared for the global landscape.

As a Research University, the Faculty is committed to ensuring that its curriculum effectively incorporates critical thinking and problem-solving abilities, creativity, and innovations in the field of Built Environment and Surveying. This emphasis provides graduates with opportunities to augment their knowledge and refine their systematic research skills, should they choose to pursue postgraduate studies within the Faculty.

I hope that students will actively participate in the academic activities organised by the Faculty while also embodying a constructive work culture rooted in positive moral values. This approach will help nurture leadership qualities, foster teamwork, and enhance individual generic skills. It's worth noting that such involvement is not only pivotal for individual academic excellence but also plays a significant role in contributing to the advancement of the nation, fostering its development on social, cultural, and political fronts.

If you have any concerns or require further information, I encourage you to explore the Faculty's website at builtsurvey.utm.my or seek guidance and advice from your academic advisors, lecturers, or the faculty's administrative staff. They will be able to provide valuable assistance and address any inquiries you may have.

I genuinely wish for you to relish your time at the Faculty, with the anticipation that the education you receive here will equip you for a successful future, allowing you to become an outstanding alum.

Dean
Professor Sr. Dr. Kherun Nita Ali

2. Introduction

1. Universiti Teknologi Malaysia

Universiti Teknologi Malaysia (UTM) is the largest engineering-based university in Malaysia offering a variety of programmes for all levels of tertiary education. The city campus is in Kuala Lumpur, the capital city of Malaysia, tropical campus in Johor Bahru, within Iskandar Malaysia, a vibrant economic corridor in the south of Peninsular Malaysia and Agri Campus in Pagoh, within the Pagoh Education Hub located in the northern part of Johor.

UTM's mission is to develop holistic talents and prosper lives through knowledge and innovative technologies. 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 1,500 academic staff, of which more than 500 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 24,000 students in both undergraduate and postgraduate programs and more than 6,000 enrolled in distance learning programmes as part-time students in various fields of specialisation. More than 5,000 of these students are international students from more than 70 countries.

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 5 Research Alliances (RA) in strategic disciplines namely Innovative Engineering, Health and Wellness, Smart Digital Community, Resource Sustainability and Frontier Materials. UTM is actively engaged in research collaborations 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.

2. Faculty of Built Environment and Surveying

The **Faculty of Built Environment and Surveying** was recently formed on 1 July 2018 under the UTM Synergy 4.0 exercise to restructure the academic entities. The exercise aimed to open more opportunities for synergy and collaboration between academia and students. This new entity is the result of merging between the previously known **Faculty of Built Environment** and the **Faculty of Geoinformation and Real Estate**.

The then Faculty of Built Environment was initially established in 1970, as the Faculty of Architecture and became the Faculty of Built Environment in 1974. The later was initially established in 1972 as the Faculty of Surveying, before rebranded to the Faculty of Surveying and Real Estate, Faculty of Engineering and Geoinformation Science and the Faculty of Geoinformation and Real Estate.

Currently the Faculty offers 9 Undergraduate degree programmes, 11 Master by Coursework programmes, Master of Philosophy programmes and Doctor of Philosophy programmes under 12 academic disciplines, namely Architecture, Landscape Architecture, Quantity Surveying, Urban and Regional Planning, Transportation Planning, Geoinformation, Geomatic Engineering, Remote Sensing, Land Administration & Development, Facilities Management, Real Estate and Generic. The student population in the faculty totals about 2,070 undergraduates and 735 postgraduates including about 200 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 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 and Surveying will keep graduates at the forefront of national and global agendas in planning, design, construction, operation, and development sectors.

The Faculty of Built Environment and Surveying 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 181 academics, 90 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.

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4. UNDERGRADUATE PROGRAMMES

The undergraduate programmes at the faculty consist of the following:

1. Bachelor of Science in Architecture with Honours
2. Bachelor of Quantity Surveying with Honours
3. Bachelor of Urban and Regional Planning with Honours
4. Bachelor of Landscape Architecture with Honours
5. Bachelor of Science in Construction with Honours
6. Bachelor of Science in Geoinformatics with Honours
7. Bachelor of Geomatics Engineering with Honours
8. Bachelor of Science in Land Administration and Development with Honours
9. Bachelor of Real Estate with Honours

Following are the details of each programme including the syllabus.

***** With Honours for 2020/2021 session onwards***

5. Bachelor of Science in Architecture with Honours

1. Introduction

Architecture is the art and science of building. Its activities encompass the design, development and planning of the built environment as well as managing the construction process. Architects play a 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 a role demands highly professional and ethical individuals in creating a better built environment. The Bachelor of Science in Architecture with Honours programme at UTM is designed to produce individuals that can fulfil this role.

The Bachelor of Science in Architecture with Honours Programme is a professional degree that is equivalent to the professional qualification of the Board of Architects Malaysia Part I (LAM Part I), which is the first part of a two-tier architecture programme. The programme emphasises on architectural design skills based on studio projects and complementary courses. Competent skills and knowledge addressed with 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.

2. Name of Award

Bachelor of Science in Architecture with Honours [B.Sc.Arch.Hons.]

3. 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.

4. Aim

The aim of the programme is to train and produce qualified professional architects (LAM Part I) with a degree in Bachelor of Science in Architecture with Honours. 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.

5. Programme Educational Objectives

The Bachelor of Science in Architecture with Honours programme shall produce Assistant Architects who are:

PEO1 Knowledgeable and technically competent in line with the professional qualification of Board of Architects Malaysia Part I.

PEO2 Professionally ethical, aware and responsive to the values of humanity and sustainability.

PEO3 Competitive, effectively communicative and contributive to working teams.

6. Programme Learning Outcomes

At the end of this programme, students will be able to:

PLO1 KNOWLEDGE AND UNDERSTANDING [KW] Specify and articulate knowledge in relation to architecture.

PLO2 COGNITIVE SKILLS [CG] Identify, analyze and integrate architectural knowledge from various sources in producing potential solutions.

PLO3 PRACTICAL SKILLS [PS] Produce feasible solutions with consideration of appropriate design approach, process using effective architectural presentation.

PLO4 INTERPERSONAL SKILLS [IPS] Capable of working in a team and negotiate responsibly, adapting in various working environments and time conditions.

PLO5 COMMUNICATION SKILLS [CS] Convey ideas and explain architectural solutions clearly and appropriately in verbal and written form to a given audience.

PLO6 DIGITAL SKILLS [DS] Adopt and operate a broad range of digital tools for knowledge sourcing, information processing and formulating potential solutions.

PLO7 NUMERACY SKILLS [NS] Comply to values set in architectural standards, regulations, guidelines, parameters and universal conventions.

PLO8 LEADERSHIP, AUTONOMY & RESPONSIBILITY [LAR] Demonstrating ability to lead and manage cooperatively towards fulfilling pre-determined goals through effective decision making and capacity-building.

PLO9 PERSONAL SKILLS [PRS] Adapt to the changing environments, engage in continuous learning, employing new knowledge and skills to address new challenges in the context of professional development.

PLO10 ENTREPRENEURIAL SKILLS [ENT] Exhibit entrepreneurial skills in architectural or related creative endeavours.

PLO11 ETHICS AND PROFESSIONALISM SKILLS [ETS] Interpret collective responsibilities of architects in general and codes of architectural ethics particularly within the framework of accountability of architecture towards humanity.

7. Programme Accreditation

The Bachelor of Science in Architecture programme is recognised by the Board of Malaysian Architects (LAM), Association of Malaysian 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 and followed by degree in Master of Architecture, who have 2 years' experience are eligible to sit for the LAM Part III examination in order to be registered as professional architects.

8. 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.

9. Mode and Duration of Study

Mode of Study : Full-time
Minimum Duration : 3 years
Maximum Duration : 4.5 years

10. 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, Research & Communication	54	68	57
	B. Technology & Environment	6		
	C. Theory & Culture	5		
	D. Practice & Management	3		
2. Elective Courses	EA, EB, EC, ED Elective Courses	32	32	27
3. General Courses	F. General Courses	20	20	16
	Total credit hours to graduate		120	100

11. 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.

12. List of Courses According to Semester (Matriculation/STPM)

Semester 1

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEA1118 Design 1	A		8	Local: 17 International: 19
2. SBEA1212 Basic Architectural Communication	A		2	
3. SBEA1512 Introduction to Architectural History	C		2	
4. SBEA1223 Basic Architectural Computing	A		3	
4. ULRS1182 Appreciation of Ethics and Civilisations	F		2	
5. ULHM1012 Malay Language for Communication 2* (For International Student Only)	F		2	

Semester 2

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEA1128 Design 2	A	SBEA1118	8	18
2. SBEA2523 Theory of Design	C		3	
3. SBEA1313 Structure and Construction 1	B		3	
4. ULRS1012 Value and Identity	F		2	
5. UHLB1112 English Communication Skills* (For MUET Band 1, 2 and 3 Only) (HW - Hadir Wajib)	F		HL	
6. XXXXXXX3 Free Elective	F		2	

Short Semester

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

Semester 3

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEA2138 Design 3	A	SBEA1128	8	Local: 18 International: 16
2. SBEA2713 Elective B (Environmental Science and Sustainability)	EB		3	
3. SBEA3843 Architecture & Human Behaviour	EC		3	
4. UHLB2122 Profesional Communication Skills I	F	UHLB1112	2	
5. ULRS1022 Philosphy and Current Issue (Local only)	F		2	

Semester 4

Courses	Course Group	Prerequisite	Credit	Total Credit
2. SBEA2148 Design 4	A	SBEA2138	8	18
3. SBEA2323 Building Services	B		3	
4. SBEA2723 Elective B (Structure and Construction 2)	EB		3	
5. SBEA2812 Elective C (Theory of Modern Architecture)	EC		2	
6. UHLB3132 Profesional Communication Skills II	F		2	

Short Semester

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

Semester 5

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEA3158 Design 5	A	SBEA2148	8	18
2. SBEA3623 Elective A (CAD & BIM)	EA		3	
3. SBEA3853 Elective C (Architectural Heritage & Conservation)	EC		3	
4. UHLXXXX2 Elective Foreign Language	F		2	
5. ULRS3032 Entrepreneurship and Innovation	F		2	

Semester 6

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEA3169 Design 6	A	SBEA3158	9	19
2. SBEA3413 Architectural Management & Practice	D		3	
3. SBEA3733 Elective B (Building Integration and Performance)	EB		3	
4. XXXXXXX2 Free Elective	F		2	
5. ULRF2XX2 Co-Curricullum and Service Learning	F		2	

13. List of Elective Courses

Courses	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. SBEA2812 Theory of Modern Architecture	EC	-	2
2. SBEA2823 Heritage Studies	EC	-	3
3. SBEA3833 Architectural Theory and Criticism	EC	-	3
4. SBEA3843 Architecture and Human Behaviour	EC	-	3
5. SBEA3853 Architectural Heritage and Conservation	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 = 29

14. 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 of design in architecture. Students undergo a series of design projects relating to 2D and 3D design composition and space articulation. The design exercises require an appropriate design process that shows the development of skills perceiving, imagining, analysing and synthesizing. The first project, which is Painting, is an introductory exercise to heighten students understanding on basic design elements and principles. The second project, Shelter and the third project, Folly is an advanced architectural design exercise that allows the students to critically organize and define the space from the bigger medium to the details. Design 1 also includes an understanding of men and environment, ergonomics, anthropometrics and scale and proportion.

SBEA1128 Design 2 (pre-requisite SBEA1118 Design 1):
Design 2 introduces more comprehensive design tasks with the advanced application of basic architectural theory, architectural elements and design principles. Design 2 also focuses on the constructability of the building. Therefore, knowledge about construction is important in this semester. Students will undergo a series of functional projects from simple to a complex house design. There is project 1: Precedent Study or Building Analysis, Project 2: Personal Studio and Project 3: A SoHo (Small office Home office). All the projects require thinking efforts, design skills and creativity to integrate knowledge in relation to space programming, form making, user needs, site planning, environmental response, precedent study, structural system and construction technology. The program also includes a systematic and effective design approach and process to heighten the ability to imagine, analyse and synthesize the design.

SBEA2138 Design 3 (pre-requisite SBEA1128 Design 2):
Design 3 Studio develops the students' design responsiveness or the design sensitivity. Students explore 'ways of seeing', understanding and interpreting how architecture concentrates and conveys natural, cultural, social and contextual forces through means specific to the discipline of the unit. In addition, the design program articulates the unique reality of architecture through the study of basic inter-relationships of brief, site, material, technology, and construction. Students learn to express and then develop an idea for an architectural proposition critically and appropriately, through their own perception and translation into a workable scheme. Design parameters shall be space making and place making depending on the requirements of projects.

SBEA2148 Design 4 (pre-requisite SBEA2138 Design 3):
The main intention of Design 4 studio 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, ideation, 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. Towards the end of the course the student will have the ability to design a medium low complexity building for a small group of users.

SBEA3158 Design 5 (pre-requisite SBEA2148 Design 4):
This first semester design exercise proposes an explorative yet pragmatic approach in architectural design. It aims to expose students to various skills in integrating the many parameters and dimensions in design. After all, design is an 'integrated response to a range of problem issues' (Lawson and Dorst 2008). It must therefore simultaneously consider specific constraints and criteria/requirements arising from key 'generators' (designer, client, user, legislator etc) that compound architectural design. As part of students' learning process, they must be able to focus to deliver an integrated solution. In this semester, students will work with a general (common) brief, which will form the basis of their own brief construct that is derived from case studies, data collection, site studies and other resources. They will then produce a pragmatic design outcome that complies to needs of the brief, the Design Matrix, and practical architectural requirements.

SBEA3169 Design 6 (pre-requisite SBEA3158 Design 5):
This is the final design studio project, marking the end of the B.Sc.Architecture programme with the Design Mini-Thesis, otherwise commonly known as the Projek Sarjana Muda (PSM). In this exercise, the students will engage and deliver a comprehensive design project that showcases the accumulated knowledge acquired previously. The Design Mini-Thesis format requires students to embark on a journey of self-realization, formulating their own brief and then executing it, before reporting the outcome in a self-contained thesis report. The project will be a multi-functional, medium scaled building complex with appropriate vertical services. The nature of the project is pragmatic, but the students are highly encouraged to push the boundaries of existing paradigms and integrate new knowledge into their design. Students should also demonstrate strong analytical thinking, concept ideation, site planning, spatial organization, form-making, structural design, architectural language and identity, place-making and design communication.

SBEA1212 Basic 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 manual drawings skills, architectural graphic skills, verbal presentation and model making. The goal of this series is to provide students with basic general skills framed in a structured delivery system. The first part of the series covers issues related to the manual techniques in presentation i.e freehands techniques, developing the students' skills in quick sketching and renderings. The second part focuses on architectural graphics such as orthographic drawings and draughtsmanship. The third part covers verbal communication, developing and harnessing appropriate techniques for an architectural presentation.

SBEA1223 Basic Architectural Computing:
This course introduces students to the fundamentals of architectural computing, which includes modelling, drafting, image manipulation and desktop publishing. Emphasis of the course will be on the exposure to students on the basics of architectural software application. Students will undergo a series of exercises to expose and familiarise themselves to a multitude of available software. At the end of the course, students will be able to identify and utilize the correct software to achieve specific objectives, as well as build a foundation for them to familiarize themselves with other, more advanced software in the future. Towards the end of the course, the student will have the ability to produce architectural drawings in accordance to drawing conventions and format with basic architectural software applications.

SBEA2933 Measured Drawing:
Architecture is a direct representation of history and place. By preserving historic structures, we are able to share the very spaces and environments in which the generations before us lived. Historic preservation is the visual and tangible conservation of cultural identity. Architecture is one aspect of our heritage with which we can interact and adapt. Some buildings have specific historic context and must be meticulously and exactly preserved. Most buildings, however, must be lived in, interacted with and maintained by the public. These buildings change with us, thus recording a piece of each generation's story. We have an obligation to respect this community resource and preserve it for future generations. Extinction of traditional buildings in Malaysia has led the Department of Architecture, Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia to take the initiative to document heritage buildings through one of its core subject for second year students majoring in Architecture. Towards the end of the course the student will produce a report on a selected architectural typology.

SBEA3623 CAD & BIM:
This course is an introduction to Building Information Modelling (BIM). 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. Towards the end of the course the student will have the ability to produce architectural drawings in accordance to drawing conventions and format with computer aided design software (CAD & BIM).

SBEA3613 Digital Visualization:
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.

SBEA1313 Structure and Construction 1:
This course is about the conventional development of building structures and construction methods. This course deals with building structure and 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, single to double storey) 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: *Building Construction*, and Section 2: *Building Structure (basic).*

SBEA1913 Construction Practice:
The programme for this independence course exposes students to practices in the workshop and the real life of construction on site (students are required to observe and record what they have seen in the form of daily activities log book and a final comprehensive construction report). The exposure on these hands-on practices provides awareness to students on various trades and difficulties in preparing construction works on site (construction field operations) and workshop (exposure to the equipment's used). This course deals with the principles and the fundamental knowledge of construction practices that include the construction-related problems and data managements. Learning thru self-experience and teamwork (peer learning) are as well included.

SBEA2723 Structure and Construction 2:
Structure and Construction II is intended to provide students with the knowledge and ability to integrate architectural design with sound structural concepts and construction knowledge. The course introduces various forms of Brick, RCC, timber and steel structures and construction that are used in architectural design. Students are introduced to basic structural materials especially related to timber, and solving problems using graphical methods. Students will also be exposed to the concepts and calculations in dealing with dead loads, live loads, dynamic loads and temperature stresses in building structures. It allows students to analyse the effectiveness of different structural and constructional systems applicable to architectural design.

SBEA2713 Environmental Science and Sustainability:
This course focuses on presenting awareness and knowledge of climate and weather in the built environment as well as elaborating the fundamentals of environmental physics and its application related to climatic responsive building design. Environmental elements such as sun-path, solar heat gain, relative humidity, airflow, natural lighting and sound on built environment will be elaborated. Exploring and learning from the primitive solutions towards understanding the basic passive climatic design principles and developing contemporary sustainable architectural solutions will be demonstrated to achieve thermal comfort and energy-efficient building design. The course also intends to provide 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.

SBEA3743 Energy Conscious Design:
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.

SBEA2323 Building Services:
This course gives the basic understanding of building sciences and services for both small-scale 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 electrical systems for the above building. Besides, the students will also be exposed to how this system should be integrated into building design and how one system will have the impact on the building design. The result of a good integration process into the design is indispensable for an architect. Therefore finally, students will use all the knowledge gained in the classroom and try to integrate them into their respective studio project designs.

SBEA3733 Building Integration and Performance:
The main task of architects is to design a building that provides safety, comfort, pleasure and an optimal living environment for its occupants. These demands should be met with the least possible amount of energy consumed and should affect the environment as little as possible. This is why all of the building's technological systems must be well controlled and integrated. This course provides an overview and demonstration of the interrelationships between architectural and technical parameters. The technical performance characteristics that are referred to include ventilation, cooling and lighting, and they are linked to considerations of space planning, building form, façade design, structural design and building services where relevant.

SBEA1512 Introduction to Architectural History:
The main objective of the course is to create awareness of the many kinds of architectural theories and language of world architecture as well as Malaysian architecture. The course provides an overview of history of architecture involving the Western and Eastern civilization; from classical to Modern times; with some understanding of the social and cultural values, political traditions, technological advancement, economic achievements as well as the environment that influence buildings and landscape of the world civilizations in world as well as Malaysia as a regional context. Towards the end of the course the student will have the ability to design a medium low complexity building for a small group of users.

SBEA2523 Theory of Design:
Design is viewed as the core discipline of architectural practice. The course is an introduction to various essential knowledge and methods, strategies of design applicable within the architectural and urban field. It will cover the process and related parameters such as processes, methods and knowledge on various issues like design creativity, problem solving, planning, space, form and place making, behaviour, culture and sustainability.

SBEA2812 Theory of Modern Architecture:
This course discusses the development of modern architectural movements that occurred in the 19th and 20th century. The syllabus covers biographical and typology studies, as well as the influence of changing technology and country-specific case studies, particularly various modern architectural theories and approaches that have significant impact towards the Malaysian architectural scenario.

SBEA2823 Heritage Studies:
The decay and demolition threats of heritage buildings in Malaysia has led the Department of Architecture, Universiti Teknologi Malaysia to take the initiative to document heritage buildings through one of its core subjects for second year students majoring in Architecture. Recording what we observe using words are more challenging than using a lens. Architectural historian and architects rely on written descriptions when comes to helpful documentation. These historical documents contain important historical information about a person, place, building or event and can thus serve as a primary sources and important ingredients. It is the information that allows us to try to understand and describe the architecture was functioning at any particular time in history.-Towards the end of the course the student will have the ability to come out of a historical and architectural report of selected heritage buildings. The final outcome of the subject will be in the form of an Architectural Monograph.

SBEA3833 Architectural Theory and Criticism:
The course relates to the appraisal and critiques of modern and contemporary theories and discourses emanating as critical responses to architectural developments of the early 20th century to the present day. The main objective of this course is to be able to develop evidence-based critique in verbal and written form based on established philosophical and theoretical frameworks. Students are further encouraged to expound fundamental and critical theories of architecture through case studies by local and foreign architects and to also take examples of students' own studio design works. The aim is to expound on the themes, positions, and values represented in those works and to critically outline their theoretical tendencies and prevalent discourses.

SBEA3843 Architecture and Human Behaviour:
The course provides the knowledge of human behaviour and practical application of the knowledge in the design processes. 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 exposed to systematic inquiries, techniques and approaches in dealing with design tasks.

SBEA1923 Outreach Program:
This program is conducted based on several meetings to organize a project that inculcates alternative self-learning and generic skill in relation to fields of architecture that involve community spirit. It acts as an event management, be it for exhibition, competition, conference, seminar, community outreach, voluntary works and so on. The programs may include students exchange with other universities, academic visit, service learning, knowledge transfer, event management and

expedition. Basic requirements such as managing the transportation, accommodation, food, tools and equipment, safety and documentation are all organized by the students registered. Team working, attitude, leadership and entrepreneurship will be the criteria for assessment.

SBEA3413 Architectural Practice and Management:
This course discusses architectural practice and management in relation to The Architect Act, the building industry and the interfaces within parties involved. The modules include registration of LAM and PAM, architectural set up, appointment of architect consultant, core services, professional fee, managing parties in building industry, construction practice 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 interfaces from design to practice, and from practice to all relevant parties in the building industry will also be included. Students will be introduced to the type and variation of practices and the different structures of architectural practices. Local governments/authorities 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 be introduced.

6. Bachelor of Quantity Surveying with Honours

1. Introduction

Undertaking a project development requires a significant investment of both time and money, and clients rightfully expect their investment to generate value. To deliver value for money, a project must be managed efficiently in terms of time, cost, and quality. Achieving these objectives requires technical expertise, professional competency, economic evaluation, effective cost management, and the selection of appropriate construction procurement methods with efficient and effective contract management. The role of a quantity surveyor, with their education, training, and experience, is crucial in managing construction costs, project procurement, contract administration, and providing advice on development economics and contractual matters.

This program is designed to provide graduates with the right skills and knowledge to operate within the existing framework of the Quantity Surveying discipline, the construction industry, and related fields. In addition to technical skills and knowledge, graduates will also be stimulated to adopt a professional and ethical approach that fosters personal development, self-respect, and career aspirations.

2. Name of Award

Bachelor of Quantity Surveying with Honours [B.QS (Hons)]

3. 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 developing 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.

4. 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.

5. Programme Educational Objectives

Bachelor of Quantity Surveying with Honours has 5 programme educational objectives:

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

PEO2 To produce graduates who are effective problem solvers, 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 graduates with basic communication skills, lead effectively and be able to work collaboratively in a multidisciplinary team.

6. Programme Learning Outcomes

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

PLO1 Combine the advanced concept and knowledge on the theoretical and practice of quantity surveying.

PLO2 Appraise critical and complex information, concept, and theories to resolve issues in the quantity surveying practice.

PLO3 Solve issues in quantity surveying practice through a wide range of latest technical approaches, skills and ideas.

PLO4 Adhere to role as a team member and to work collaboratively in various environments with ethically and professionally.

PLO5 Communicate effectively using appropriate methods to specialist and non-specialist audience.

PLO6 Demonstrate digital literacy skills through a broad range of information, media and related technology applications.

PLO7 Apply numerical and graphical data through statistical tools in work and research related applications.

PLO8 Display leadership, autonomy and responsibility in managing duties within organisation and to stakeholders.

PLO9 Engage in self-directed life-long learning initiatives to ensure self-advancement in professional development.

PLO10 Integrate entrepreneurial knowledge with technical skills to identify opportunities in projects.

PLO11 Perform professional responsibilities in accordance with stipulated legal, ethical and codes of practice.

7. Accreditation

The Bachelor of Quantity Surveying with Honours programme is accredited by the Board of Quantity Surveyors Malaysia (BQSM), Malaysian Qualification Agency (MQA) and recognised by the Public Service Department (JPA). Graduates of this programme are eligible to register with the BQSM through various categories of registrations starting as Provisional Quantity Surveyors (PVQS), and later as Professional Quantity Surveyors (PQS) or Consultant Quantity Surveyors.

8. Career Prospects

Graduates of the programme will be able to practice in the following capacity in both public and private sectors:

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

9. Mode and Duration of Study

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

10. 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	17	88	69
	B. Measurement & Documentation	18		
	C. Professional Practice	18		
	D. Construction Economics	11		
	E. Legal & Contractual Studies	6		
	F. Construction Science & ICT	4		
	G. Management	6		
	H. Research & Development	8		
2. Elective Courses	I. Elective Courses	23	23	18

3. General Courses	J. General Courses	16	16	13
	Total credit hours to graduate		127	100

11. Award Requirements

To be eligible to graduate from this programme, students must achieve a total of not less than 127 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 and fulfil other requirements stated in the UTM Academic Regulation.

12. List of Courses According To Semester (Matriculation/STPM)

Semester 1

Courses	Course Group[1]	Prerequisite	Credit	Total Credit
1. SBEQ1113 Construction Technology I	A		3	14*
2. SBEQ1152 Draughtsmanship			2	
3. SBEQ1343 Introduction to Quantity Surveying	C		3	
4. SBEQ1412 Principles of Economics	D		2	
5. SBEQ1612 Introduction to Information Technology	F		2	
6. ULRS1182 Appreciation of Ethics & Civilization	J		2	
7. UHLM1012 Malay Language for Communication (for International Students)			2	

Note: *Total sum of credit hours for local students. The total sum of credit hours for international students will consider an additional 2 credit hours for UHLM1012.

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ1123 Construction Technology II	A		3	15
2. SBEQ1132 Construction Materials			2	
3. SBEQ1182 Building Services I			2	

4. SBEQ1283 Introduction to Construction Measurement	B		3	
5. SBEQ1513 Principles of Law, Contract & Tort	E		3	
6. UHLB1112 English Communication Skills*	J		HL	
7. ULRS1012 Value & Identity			2	

i.Note:* UHLB1112 detail refers to UTM.J.08.06/14.10/1/3/2 Jld 3 (15) dated 27th September 2022. HW compulsory audit course.

Semester 3

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ2162 Building Services II	A		2	17
2. SBEQ2273 Construction Measurement I	B	SBEQ1283	3	
3. SBEQ2432 Building Economics	D		2	
4. SBEQ2622 Principles of Structures	F		2	
5. SBEQ2632 Engineering Survey			2	
6. SBEQ2722 Financial Management	G		2	
7. ULRS1022 Philosophy and Current Issues	J		2	
8. UHLB2122 Professional Communication Skills I		UHLB1112	2	

Semester 4

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ2263 Construction Measurement II	B	SBEQ2273	3	17
2. SBEQ2423 Cost Estimating	D		3	
3. SBEQ2892 Introduction to Statistics			2	
4. SBEQ2523 Construction Contract	E		3	
5. SBEQ2712 Principle of Management	G		2	
6. UHLB3132 Professional Communication Skills II	J	UHLB2122	2	
7. ULRF2xx2 Co-Curriculum Service Learning			2	

Semester 5

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ3173 Civil Engineering Construction	A		3	18
2. SBEQ3333 Professional Practice & Procedures	C		3	
3. SBEQ3442 Cost Planning & Control	D		2	
4. SBEQ3732 Project Management	G		2	
5. SBEQ3742 Facilities Management[1]	I		2	
6. SBEQ3532 Construction Procurement & Dispute Resolution[1]			2	
7. SBEQ2642 IT Applications in Built Environment[1]			2	
8. ULRS3032 Entrepreneurship & Innovation	J		2	
9. UHLXXXX2 Elective Foreign Language			2	

Note: [1]Elective courses to be offered, choose 4 credits. Elective courses will be advised by the Programme Coordinator.

Semester 6

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ3328 Industrial Training (HW) [1]	C	SBEQ3333	8	12
2. SBEQ3314 Industrial Training Reports	C	SBEQ3333	4	

Note: [1]HW: Compulsory Audit Course

Semester 7

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ4223 Project Documentation	B	SBEQ1283 SBEQ2273 SBEQ2263	3	16
2. SBEQ4253 Construction Measurement (Mechanical and Electrical Works)	B		3	
3. SBEQ4452 Development Economics	D		2	
4. SBEQ4882 Undergraduate Project 1	H		2	

5.	SBEQ4542 Land Law[1]	I		2	
6.	SBEQ4652 Construction Information Technology[1]			2	
7.	SBEQ4772 Sustainable Construction[1]			2	
8.	SBEQ4762 Commercial Management[1]				

Note: [1]Elective courses to be offered, choose 6 credits. Elective courses will be advised by the Programme Coordinator.

Semester 8

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ4283 Project Evaluation & Development	B	SBEQ4452	3	18
2. SBEQ4874 Undergraduate Project II	H	SBEQ4882	4	
3. SBEQ4242 Construction Measurement (Civil Engineering Work)[1]	I		2	
4. SBEQ4232 Construction Measurement (Specialised Construction)[1]			2	
5. SBEQ4552 International Contracting[1]			2	
6. SBEQ4752 Value Management[1]			2	
7. SBEQ4662 Intelligent Construction[1]				
8. XXXXXXX3 Free Elective			3	

Note: [1]Elective courses to be offered, choose 8 credits. Elective courses will be advised by the Programme Coordinator.

13. Syllabus Synopses

The syllabus synopsis below covers only the core and elective courses offered in this programme. Syllabus synopses for the university general courses are listed in the University General Courses section.

SBEQ1113 Construction Technology I

The aim of this course is to develop an understanding of construction technology and its application in the construction of low-rise domestic and commercial buildings that are not more than 5 stories tall. It examines the processes and techniques related to the construction of substructures, frames, enclosures and finishes. The course also introduces students to the Uniform Building by Laws (UBBL). The course provides students with construction knowledge to be applied in other courses such as estimating, measurement, construction planning and services. The course also

provides an avenue for students to develop their communication skills and the ability to work effectively as a team member to achieve mutual objectives.

SBEQ1182 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 covers common building services systems and equipment within a building. It is intended to enable students to be conversant with the building services engineering and provide them 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 objectives.

SBEQ1132 Construction Materials
The overall aim of this course is to introduce students to the properties and behaviour of common materials used in construction and the method of drafting specifications. It is intended to enable students to be conversant with the building materials and typical methods 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 objectives.

SBEQ1343 Introduction to Quantity Surveying
This course introduces students to the overall quantity surveying programme and the programme outcomes the roles of quantity surveyors at pre and post contract stages, professional ethics, 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 related to the quantity surveying practice, pre-contract processes that include project development procedures, tendering, documentation, procurement system and contract documents; and works related to post contract administration. This course also 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.

SBEQ1412 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 objectives.

SBEQ1123 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 provides students with construction knowledge to be applied in other courses such as estimating, measurement, construction planning and services. The course also provides an avenue for students to develop their ability to communicate technical information graphically and to work effectively as a team member to achieve mutual objectives.

SBEQ1152 Draughtsmanship
The course is designed to provide students with the knowledge and skills to interpret and prepare construction drawings. The topics 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.

SBEQ1283 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 focuses on the application of the principles of measurement and an introduction to quantification of simple building works. The course also provides the environment to develop students' communication skills.

SBEQ1513 Principles of Law, Contract & Tort
The aim of this course is to provide students with the basic principles of law. The objectives are: to introduce the main principles of the Malaysian legal system, to elucidate certain specified principles of the law of tort, agency and sale of goods relevant to construction works and 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.

SBEQ1612 Introduction to Information Technology
This course is designed to provide an introduction to word processing, spreadsheets, databases and presentation software. It also provides students with experience in using the relevant software and helps them develop skills in the use of the software for various tasks. The course also enables students to develop their own word processing documents, spreadsheet and database.

SBEQ2162 Building Services II
The aim of this course is to provide knowledge and understanding of the various building and infrastructure services. This course covers the common building and infrastructure services system and equipment. 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 objectives.

SBEQ2273 Construction Measurement I (prerequisite: SBEQ1283)
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 further develops the knowledge, understanding and the skill of measurement of construction works according to the 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.

SBEQ2432 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 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 covers 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 goals.

SBEQ2622 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.

SBEQ2632 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 emphasises 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 objectives.

SBEQ2722 Financial Management
This course introduces students to the basics of financial management. It covers book keeping, balance sheets, 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 objectives.

SBEQ2263 Construction Measurement II (prerequisite: SBEQ2273)
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 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 the written form.

SBEQ2423 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 various methods and techniques and to build up rates. By identifying the factors that influence the cost, 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.

SBEQ2523 Construction Contract
The aim of this course is to introduce to the students the important clauses in construction contract. The objectives are: to explain to the students the principles and the implications of the main terms of construction contract, and 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 objectives.

SBEQ2712 Principles of Management
This course provides knowledge and develops understanding of the principles of management including the current changes and developments. It emphasises on 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 relationships, interact with colleague and work effectively with other people to achieve mutual objectives.

SBEQ2892 Introduction to Statistics
The aim of this course is to provide students with an understanding of the mathematical methods and analysis techniques. Basic statistical concepts and methods are presented in a manner that emphasizes on the principles of data collection and analysis. Much of the course will be devoted to discussions of how statistics is commonly used and applied correctly in the research.

SBEQ3173 Civil Engineering Construction
The aim of this course is to develop an understanding of civil engineering structures and special constructions. The course provides students with skills to allow for 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 objectives.

SBEQ3333 Professional Practice & Procedures
This course introduces students to the process and procedures at pre and post contract stage and develop their knowledge and understanding of the terms and conditions contained 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 processes and procedures of quantity surveyor practice. The course consists of three main parts: part one relates to pre-contract processes that include tender evaluation and contractual preparation; part two covers works related to post contract administration; part three covers professional ethics and quantity surveyors, quantity surveying firms, appointment of consultants and current issues in the construction industry and quantity surveying practices.

SBEQ3442 Cost Planning & Control
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, 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.

SBEQ3732 Project Management
This course prepares students with a comprehensive introduction to construction management techniques and tools. It not only aims to provide 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 objectives.

SBEQ3742 Facilities Management
This course introduces students to the various building components to understand the various basic systems and functions of building components and their integration with the building system and the concept of facilities management and its application in various organisations 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, 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 objectives.

SBEQ3532 Construction Procurement & Dispute Resolution
This course is designed to provide students with the knowledge and understanding about the concept of the various construction project delivery systems and dispute resolution that are adopted in the construction industry. In terms of construction project delivery system, the students would be exposed to the traditional, turnkey, design and build, PFI, PPP and relationship-based delivery methods such as partnering and alliancing used in Malaysia and other countries. The emphasis would be on the legal and strategic aspects of the various delivery system against the background of the project requirements, clients' needs, risks allocation and current construction practices. In terms of dispute resolution methods, exposure would be given to the various methods of dispute resolution that are being utilised in the construction industry as alternatives to litigation which include adjudication, mediation, dispute review board and arbitration. The course also examines the process, procedures, relevant clauses and the legal implications in the various methods used to resolve disputes.

SBEQ2642 Information Technology Applications in Built Environment
This course is designed to enable students to create business applications with simple programming or scripting language. This course provides problem solving and computer programming skills for students with no prior experience in the area of programming. Students will be using coding language i.e. Phyton, Visual Basic, Java and object-oriented computer programming language to learn the fundamentals of computer programming including how to write, compile and execute programs.

SBEQ3328 Industrial Training (prerequisite: SBEQ3333) [HW Compulsory Audit Course)
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.

SBEQ3314 Industrial Training Reports (prerequisite: SBEQ3333)
This course requires 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, students should be able to present information and express ideas clearly, effectively and confidently.

SBEQ4223 Project Documentation (prerequisite: SBEQ1283, SBEQ2273, SBEQ2263)
The aim of the course is to expose students to real practice in the preparation of tender documents. This course further provides students with 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.

SBEQ4253 Construction Measurement (Mechanical & Electrical Works)
The aim of the course is to equip 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 preparing the 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.

SBEQ4452 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 appraisals for different types of property, development control, prepare simple development appraisals using the residual and cash flow methods and identify the different types and sources of development finance. The course also provides the platform to develop students' communication skills.

SBEQ4882 Undergraduate Project I
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 a 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 processes and prepare research proposals. Students should be able to seek information from a variety of sources, be 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.

SBEQ4542 Land Law
This course provides 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 titles; as well as 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 objectives.

SBEQ4652 Construction Information Technology
This course will enhance students' knowledge and understanding of information technology applications in the construction industry. The emphasis of the course is to enable students to understand the importance of information and communication technology in the construction industry. This course covers the use of information and communication technology in the construction industry, its development and its strategic implementation.

SBEQ4772 Sustainable Construction
This course explores the primary interface between the technologies of sustainable and high technology buildings. It deals 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.

SBEQ4762 Commercial Management
The aim of this course is to develop students' knowledge and understanding on the principles of commercial management from inception to completion, from the construction organisations' perspective. This course is designed to provide students with knowledge and skills related to financial and contractual issues requirement to maximise the profitability of a project. Topics covered include commercial management in project-oriented organization, developing business networks and managing clients, cost evaluation, invoicing and management of cash flow, and teamwork and partnering. The course also provides the platform to develop students' communication skills and the ability to seek information from various sources.

SBEQ4283 Project Evaluation and Development (prerequisite: SBEQ4452)
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 provides a premise for students to integrate and apply the other related courses studied in 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 be 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.

SBEQ4874 Undergraduate Project II (prerequisite: SBEQ4882)
This course is a continuation of Undergraduate Project I (SBEQ 4882) and requires students to undertake a dissertation project based on the research proposal that was prepared in SBEQ4882. At the end of the course, students should be able to undertake literature review, identify data and information relevant to the research and its sources, collect data and information using appropriate data collection techniques, analyse and synthesise data, report findings, conclusion draw from the 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 to look for alternative ideas and solutions, present information and express ideas clearly, effectively and confidently; and act ethically with integrity.

SBEQ4242 Construction Measurement (Civil Engineering Works)
The aim of the course is to equip students with the knowledge and skills of measurement and quantification of civil engineering works to complement the needs of the profession. This course further provides the knowledge, understanding and the skill of measurement of civil engineering works according to the Malaysian Civil Engineering Standard Method of Measurement (CESMM) for the purpose of preparation of bills of quantities and estimating. The course focuses on the application of the principles of measurement and quantification of infrastructure and civil engineering works.

SBEQ4232 Construction Measurement (Specialised Construction)
The aim of the course is to equip the students with the knowledge and skill of measurement and quantification of specialised engineering works to complement the needs of the profession. This course further provides the knowledge, understanding and the skill of measurement of specialised engineering works according to the Malaysian Civil Engineering Standard Method of Measurement (MyCESMM) for the purpose of preparation of bills of quantities and estimating. The course focuses on the application of the principles of measurement and quantification of infrastructure and specialised engineering works.

SBEQ4552 International Contracting
This course is designed to provide the knowledge and understanding for students on the legal principles in relation to international contracting. The scope of this course encompasses an overview of the unique problems faced by firms engaging in international activities; the importance of understanding the foreign economic, social, political, cultural and legal environment; joint ventures, international dimensions of management, marketing and accounting, international financial management; international standard forms of contract; recent problems of the international economic system; dispute resolution and contracting risk analysis. The course also provides the platform to develop students' communication skills.

SBEQ4752 Value Management

This course introduces 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, 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.

SBEQ4662 Intelligent Construction

This course is designed to provide students with the knowledge and skills in adopting process and technology innovation in the various stages of project development. Topics covered include artificial intelligence techniques and tools, GIS, wireless technology, knowledge work system and smart and green buildings. The concept of electronic site measurement will also be introduced in order to enhance the process of site valuation and measurement of changes in construction. The course also provides the platform to develop students' communication skills and the ability to seek information from various sources.

7. Bachelor of Urban and Regional Planning with Honours

1. 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 while at the regional and national level, the profession focuses on strategic and structural planning. Across all spatial scales, the profession seeks to balance between society, economy and the environment by managing developments through policies, strategies and plans.

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

2. Name of Award

Bachelor of Urban and Regional Planning with Honours [B.URP (Hons)]

3. Philosophy

B.URP (Hons) is a studio-based programme with emphases on design for people, critical and creative thinking, digital and interpersonal communication skills and problem-based learning projects which equip students to become professional town planners with the ability to approach problems from multiple perspectives. The programme is designed to graduate future urban planners with knowledge and skills on the aspects of development, environment, information technology, infrastructure, project management as well as institution and law to understand and face the challenges associated with cities and urban development in Malaysia, ASEAN, Asia and the world.

4. 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.

5. Programme Educational Objectives

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

PEO1 Graduates possess 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 Graduates value and practice a culture of continuous learning, adaptability and innovativeness in the urban and regional planning profession in an economically, socio-culturally and technologically dynamic world.

PEO3 Graduates with basic knowledge and generic skills to venture into diverse career opportunities in the field of urban and regional planning and beyond, locally and globally.

PEO4 Graduates demonstrate awareness and sensitivity about the roles of urban and regional planning in achieving socioeconomically and culturally responsive, economically feasible sustainable development.

PEO5 Graduates exhibit high professional ethics in practicing urban and regional planning in compliance with planning legislation and professional requirements of the Board of Town Planners Malaysia.

6. Programme Learning Outcomes

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

PLO1 Articulate and discuss in coherent manner philosophies, theories, concepts, approaches and principles in urban and regional planning and related fields.

PLO2 Apply knowledge and skills appropriately towards holistically addressing urban and regional planning issues in diverse contexts.

PLO3 Deftly conduct surveys, perform analyses and evaluate alternative planning proposals using appropriate techniques, tools and state-of-the-art technologies in sync with current institutional and professional practices.

PLO4 Work together with different people in diverse learning and working communities as well as other groups locally and internationally.

PLO5 Effectively and convincingly communicate planning ideas, rationales and propositions through written, visual and oral presentations to different audiences.

PLO6 Apply a broad range of information, digital and mobile technologies to support urban and regional planning works covering data collection or mining, analysis, design and display.

PLO7 Critically analyse and interpret numeric or quantitative data for synthesising planning issues and systematically formulating and evaluating alternatives solutions to identify planning issues.

PLO8 Effectively lead, collaborate with and empower team members, build consensus, accommodate and celebrate differences within a team towards accomplishing collective goals in planning and related fields.

PLO9 Consistently demonstrate appreciation of broader socio-political, economic and cultural issues at local, national and regional level.

PLO10 Adeptly recognise and innovatively act upon emerging opportunities in planning projects taking into account potential risks and economy feasibility in resolving issues in urban and regional planning.

PLO11 Apply high ethical and moral values, professionalism and accountability in performing duties and tasks that have bearing on the interests and wellbeing of the society and the environment, in keeping with key global agenda on sustainable development.

7. Accreditation

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

8. 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 PLANMalaysia (previously known as Jabatan Perancangan Bandar dan Desa), Jabatan Kerajaan Tempatan, Jabatan Perumahan Negara, Jabatan Pengurusan Sisa Pepejal Negara, Jabatan Lanskap Negara and all local authorities. In the private sector, the graduates have the potential to work in urban planning consultancy firms, property developers, project management firms and construction companies. Other opportunities for the graduates include teaching or working with NGOs focusing on the society and the environment.

9. Mode and Duration of Study

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

10. 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	96	74
	B. Principal Courses	54		
	C. Industrial Training	12		
2. Elective Courses	D. Elective Courses	18	18	14
3. General Courses	E. General Courses	16	16	12
	Total credit hours to graduate		130	100

11. Award Requirements

To be eligible to graduate from this programme, students must complete a total of 130 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.

12. List of Courses According To Semester (Matriculation/STPM)

Semester 1

Courses	Course Group[1]	Prerequisite	Credits	Total Credits
1. SBEW1215 Studio 1: Experiencing Cities and Human Settlements	A		5	15*
2. SBEW1422 Urbanisation & History of Planning	B		2	
3. SBEW1413 Land Use, Climate Change & Sustainability	B		3	
4. SBEW1613 Quantitative Techniques for Planning	B		3	
5. ULRS1182 Appreciation of Ethics and Civilisations (Local)	E		2	
6. UHLM1012 Malay Language for Communication 2* (For International Student Only)	E		2	

Note: *Total sum of credit hours for local students. The total sum of credit hours for international students will consider an additional 2 credit hours for UHLM1012.

Semester 2

Courses	Course Group	Prerequisite	Credits	Total Credits
1. SBEW1225 Studio 2: Site Planning and Layout Design	A	SBEW1215	5	16
2. SBEW1623 Green Infrastructure & Utilities for Planning	B		3	
3. SBEW1713 Geospatial Analysis in Planning	B		3	
4. SBEW1723 Traffic Engineering	B		3	
5. ULRS1012 Value and Identity	E		2	
6. UHLB1112 English Communication Skills* (For MUET Band 1, 2 and 3 only) HW	E		HL	

Semester 3

Courses	Course Group	Prerequisite	Credits	Total Credits
1. SBEW2235 Studio 3: Urban Place Making	A	SBEW1225	5	17
2. SBEW2432 Planning System and Practice	B		2	
3. SBEW2633 Planning Methods and Techniques	B		3	
4. SBEW2733 Urban Mobility	B		3	
5. ULRS1022 Philosophy and Current Issues	E		2	
6. UHLB2122 Professional Communication Skills I	E	UHLB1112*	2	

Semester 4

Courses	Course Group	Prerequisite	Credits	Total Credits
1. SBEW2245 Studio 4: Development Plan	A	SBEW2235	5	19
2. SBEW2312 Community Planning and Housing	B		2	
3. SBEW2443 Regional and Rural Planning	B		3	
4. SBEW2513 Urban Design and Sustainable Urbanism	B		3	
5. ULRFXXXX Co-Curriculum Service Learning	E		2	
5. UHLB3132 Professional Communication Skills II	E	UHLB2122	2	
6. UHLX1112 Elective Foreign Language	E		2	

Semester 5

Courses	Course Group	Prerequisite	Credits	Total Credits
1. SBEW3255 Studio 5: Special Action Plan	A	SBEW2245	5	18
2. SBEW3453 Planning Legislation	B		3	
3. SBEW3552 Environment, Sustainability and Planning	B		2	
4. SBEWXxx3 Elective 1*	D		3	
5. SBEWXxx3 Elective 2*	D		3	
6. ULRS3032 Entrepreneurship and Innovation	E		2	

Note: * Please refer to the Elective Course Groupings section.
* Elective courses to be offered will be advised by the Programme Coordinator.

Semester 6

Courses	Course Group	Prerequisite	Credits	Total Credits
1. SBEW3818 Industrial Training (HW) [1]	C	SBEW3255	8	12
2. SBEW3844 Industrial Training Report	C		4	

Note: [1]HW : Compulsory Audit Course

Semester 7

Courses	Course Group	Prerequisite	Credits	Total Credits
1. SBEW4265 Studio 6: Project Planning & Feasibility	A	SBEW3255	5	17
2. SBEW4272 Undergraduate Project 1 (PSM 1)	B		2	
3. SBEW4322 Urban Economics and Finance	B		2	
4. SBEW4332 Social Inclusion and Planning	B		2	
5. SBEWXxx3 Elective 3*	D		3	
6. SBEWXxx3 Elective 4*	D		3	

Note: * Please refer to the Elective Course Groupings section.
* Elective courses to be offered will be advised by the Programme Coordinator.

Semester 8

Courses	Course Group	Prerequisite	Credits	Total Credits
1. SBEW4284 Undergraduate Project 2 (PSM 2)	B	SBEW4272	4	16
2. SBEW4293 Planning Conference	B		3	
3. SBEW4463 Planning Theory	B		3	
4. SBEWXxx3 Elective 5	D		3	
5. *** Free elective (Cross Faculty)	D		3	

Note: * Please refer to the Elective Course Groupings section.
* Elective courses to be offered will be advised by the Programme Coordinator.

13. Elective Courses Groupings

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

Specialisation	Elective Courses
Urban Design	SBEW3113 Critical and Creative Thinking in Planning SBEW4153 Urban Design Framework SBEW4193 Urban Regeneration and Conservation
Tourism Planning	SBEW3163Tourism Resource Management SBEW4163 Case Studies in Tourism Planning SBEW4173 Tourism Destination Planning
Low Carbon Society	SBEW3143 Climate Change and Cities SBEW4133 Low Carbon Society SBEW4143 Emergent Technologies and Urban Change
GIS Technology	SBEW3183 Spatial Analysis and Modelling SBEW3193 Geospatial Application
Transportation Planning	SBEW3133 Case Studies in Public Transport SBEW4183 Traffic Impact Assessment
Rural Planning and Development	SBEW3123 Rural Settlement SBEW3173 Rural Economic Development SBEW4123 Rural Community and Culture
Impact Assessments	SBEW3153 Social Impact Assessment SBEW4113 Environmental Impact Assessment

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

14. Syllabus Synopses

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

SBEW1215 Studio 1: Appreciation of Cities and Human Settlements
This course aims at instilling new urban planning students with the awareness of fundamental human-environment relationship, and the problems of our present-day built environment, in terms of urban liveability and sustainability that lead to the basic appreciation of, and passion for, good urban planning and design. The studio focuses on training students in excelling their various skills of perceiving and appraising the built environment and the society that constantly shapes and uses it. This studio also enhances students' ability to communicate their opinions effectively, and enables them to evaluate the built environment in visual (graphics such as freehand sketching and perspective drawing) and verbal modes. In view of the importance of computer-aided design and digital media in the current planning practice, the studio also provides students with basic training in AutoCAD and Sketch-Up.

SBEW1613 Quantitative Techniques for Planning
In a diverse society, understanding population characteristics as well as their preferences and opinions are extremely important for urban planners to guide planning decisions. In this course, students will learn how to sample the population and to extract data/responses from these selected samples using systematic procedures. Data and responses obtained are then converted into meaningful information using statistical techniques. At the end of this course, students will be able to make informed urban planning decisions based on the statistical analysis performed on the sampling data.

SBEW1413 Land Use, Climate Change and Sustainability
With the increasing concerns on land use sustainability and climate change, this course emphasises on current issues with regards to land use and the effects of climate change and sustainability on future land use planning. Therefore, the course aims to provide students with understanding and knowledge on land use and climate change, and future implications for society and resource use, in the context of sustainable development. At the end of the course, students will be able to discuss theories, concepts and principles of urban growth and planning of urban land uses; apply land use planning control tools; and propose land use patterns that are in line with mitigation of and adaptation to climate change.

SBEW1422 Urbanisation and History of Planning
Knowledge on the history of urban planning, process of human settlement and urbanisation gives crucial exposure to students regarding the profession of urban and regional planning. In this course, students will understand how the process of early settlement evolves into current modern cities. This will include the understanding of the planning concepts and approaches based on certain phenomenon and issues in Europe, Asia and America; and including the Malaysian context. At the end of this course, students will be able to make informed decisions about the process of the early settlement and urbanisation and the selected planning concepts and approaches.

SBEW1225 Studio 2: Site Planning and Layout Design (prerequisite: SBEW1215)
This studio introduces students to the theory, basic principles, technical requirements and practice of site planning for the development process. The module explores key concepts, ideas and standards that shape approaches to site planning and layout design. It is designed to develop students' skills in concept plan preparation by referring to the related and existing planning guidelines, standards and other basic principles in order to achieve an ideal and

sustainable layout design. Students will learn how to develop proposed design solutions for sites in ways that harmoniously and responsibly respond to the surrounding context. At the end, students should be able to prepare a layout design of a neighbourhood/township in an urban site with considerations on the planning guidelines and standard and explain the design ideas graphically and verbally.

SBEW1623 Green Infrastructure and Utilities for Planning
Understanding the principles of planning and design as well as the benefits of green infrastructure is important for urban planners to solve urban and climatic challenges in cities. In this course, students will learn to identify the shortcomings from the current infrastructure provision and understand the need to change to green infrastructure. This course provides an understanding of the green infrastructure elements and the requirement methods of green infrastructure provisions in an urban context. At the end of this course, students will be able to forecast the needs of green infrastructure and utility provision at the local level, such as the preparation of layout design proposals with considerations on the related guidelines.

SBEW1713 Geospatial Analysis in Planning
Geographic Information Systems (GIS), one of the forms of geospatial technology is a rapidly evolving technology, involving the study of spatial (geographic) location of features on the Earth's surface and the relationships between them. As the work of urban planners fundamentally involves the study of location and spatial relationships, today's employers increasingly expect graduates of urban planning programs to possess a working knowledge of GIS. The course is offered to give students exposure to the fundamental concepts related to geospatial analysis which are Geographic Information Systems, Global Positioning Systems, Cartography and Remote Sensing. It stresses on the learning of ESRI ArcGIS software. Students will be involved in the basic GIS data development, using a hands-on approach. It will concentrate on how urban planners typically use GIS as a tool for analysis, data mining and display of quantitative data in order to solve urban planning problems. At the end of the course, students will possess the fundamental GIS skills valued by today's employers.

SBEW1723 Traffic Engineering
In complex cities, achieving a safe and efficient movement of people, goods and roadways is important for planners to guide planning decisions. This course aims to impart the knowledge of traffic analysis, use of speed flow density relationships, computation of road and intersection capacity, parking and traffic calming management methods. At the end of this course, the students must be able to use relevant equipment and approved methods to collect and analyse traffic data for meaningful information.

SBEW2235 Studio 3: Urban Place Making (prerequisite: SBEW1225)
The Urban Place Making studio focuses on the student's ability and skills in the gathering, analysis and synthesis of data. Students will need to prepare appropriate survey instruments as well as analysis and synthesis techniques. These processes are crucial in determining the validity of a study before they can design a proposal on how to improve and enhance the existing ambience of a city area. The scope of study will cover the socio-economic and physical aspects – street layouts, transportation facilities, physical images, existence of undesirable elements and policy aspects. At the

end of this course, based on findings from the survey stage, students should be able to propose a solution for the poorly-utilised or unused land or space, traffic congestion etc., in order to ensure residents and visitors can effectively use the limited space in cities without compromising their safety and comfort.

SBEW2733 Urban Mobility
Sustainable urban mobility planning aims to create a sustainable urban transport system by satisfying the mobility needs of people and businesses, today and tomorrow. Planners need to integrate the planning approach with surrounding land uses and all transport modes in order to make a sustainable urban transportation system. This course equips students' knowledge on land use and transportation relationships, transport demand and supply management techniques and models. At the end of this course students will be able to make sound planning decisions from analysis of transport demand and supply models.

SBEW2633 Planning Methods and Techniques
Planners need structured techniques and analytical rigor to examine problems and guide planning decisions. This course provides a comprehensive understanding of key analytical techniques frequently used by the urban and regional planners. In this course, students will learn the main techniques used for analysing population, economic growth and land use changes. At the end of this course, students will be able to develop their analytical skills in using computer software to make informed planning decisions based from the analysis performed.

SBEW2432 Planning System and Practice
Human settlements are inherently complex systems; thus the planning of such settlements is essentially a system by itself. As such it is vital that URP undergraduates are aware of the concept of 'system'; its manifestation in cities; and its implications on the planning practice and process. This course aims to introduce to second year URP undergraduates the planning system in general and with specific reference to Malaysia; various components of the planning system and process; and key public, private and civil institutions that play specific roles within the planning system. The course begins with understanding the concept of 'system'; approaching cities as systems; and conceptualising planning as a system. This is followed by a discussion on the main components of the planning system that comprises development planning, planning control, enforcement and other "balancing" mechanisms; and a discussion and case studies of various public, private and civil institutions that jointly operationalise the planning system in Malaysia. The Planning System and Practice course provides students with an overview of the setup and working of urban and regional planning; and complements The Studio Course.

SBEW2245 Studio 4: Development Plan (prerequisite: SBEW2235)
The exercise is aimed at studying the existing statutory plan under ACT 172 for multiple-level types of developments, with the intention to understand different components of an urban and regional development, in terms of the inter-linkages of various sectors. This will be enhanced by the exercise on formulating visions and goals for the regional, state and district study as a whole, and the sectors in detail. This will be done through the collection of secondary data and a field visit of the study area. The field work also covers the aspects of public participation, taking into account consultation with stakeholders.

SBEW2513 Urban Design and Sustainable Urbanism
The New Urban Agenda specifically highlights urban planning and design as a cornerstone to the production of "well-planned and designed urban areas which add to the quality of life". The Royal Town Planning Institute's New Vision for Planning emphasises on the "delivery of sustainable communities, settlements and places" through action-oriented activities of mediating space and dealing with the unique needs and characteristics of places. These points to the indispensable role of urban design in creating more sustainable and liveable cities and delivering sustainable urbanism. The course therefore aims to impart to URP students urban design knowledge and skills that are indispensable but largely missing in current planning practice. It covers a critical discussion on the current state of unsustainable urbanism and missing links in current planning practice; the scope of urban design and its relationship with various built environment professional practices; key concepts and principles in urban design; perception and visual assessment techniques of 'image of the city' and 'townscape analysis'; 'responsive environments', PSPL (public space public life) and place-making approaches to designing good cities; urban morphology and figure ground techniques for urban framework analysis; urban conservation and regeneration approaches to sustainable urbanism; and emerging concepts such as the New Urbanism, smart growth and low carbon society (LCS). The course will conclude with a discussion on the future of urbanism and urban design.

SBEW2312 Community Planning and Housing
Community planning and housing is a fundamental issue impacting on people's wellbeing and quality of life. Urban decay, lack of affordable housing, the loss of population and jobs, and the mounting costs of public services threaten our cities and regions. In this course, students will learn various approaches of community engagement, empowerment, homeownership and sustainable housing through lectures and case studies. At the end of this course, students will be able to make various informed community planning and housing decisions based on case studies and in class activities.

SBEW2443 Regional and Rural Planning
Understanding the issues related to regional and rural planning such as rapid rural land use change, urban sprawl, inefficient facilities and amenity provision is essential, so that planners can identify the strategic solutions for them. In this course, students will learn the theory and practices of regional and rural planning, as well as the evolution of regional and rural planning in Malaysia for different regions and identify the contributing factors. At the end of this course, students will be able to analyse the regional and rural planning and development approach, strategy and program in Malaysia, using basic techniques for the methods of regional analysis.

SBEW3522 Environment, Sustainability and Planning
This course aims to develop fundamental knowledge of the concepts and mechanisms of environment and sustainability, and in connection with the planning process and the eventual goal of sustainable urban development. Students are expected to appreciate the basic functions of natural ecosystems and built environments and the interdependence between ecosystems and human development activities, the impacts of land development on ecosystems, and the harmonious balance between the natural and built environments. An appropriate environmental planning and management tool or technique to adapt the existing and future planning, and development towards sustainable development will also be introduced to the student. Student-cantered learning that focuses on the development of critical thinking is delivered through current issues and real world-based approach. The learning process emphasises on active-blended learning, which predominates over the teaching system. The course also stimulates critical thinking of students through the evaluation on the application of environmental planning tools, by employing case studies in a series of assignments. An online quiz and a forum are also offered to students in order to create an ever-ready alertness. This is to comply with the blended learning approach. A mini project that aims to motivate students' critical thinking and problem-solving ability in addressing the dilemma of environmental protection and urban development is also given.

SBEW3255 Studio 5: Special Action Plan (prerequisite: SBEW2245)
This studio exercise focuses on the preparation of a subject plan. With the increasing numbers of generation, revitalisation or rehabilitation projects in the country, this studio provides students the opportunity to understand and experience the process to implement the project. The subject plan will be identified based on suggestions by any local authority or related agencies for improvement redevelopment, beautification and conservation of the area. The studio requires students to conduct projects such as Tourism Master Plan, Coastal Area Tourism Plan, Development of TOD project, Urban Conservation Project, Transportation Master Plan, Pedestrian and Cycling Master Plan. These are the potential projects that can be introduced in this studio.

SBEW3453 Planning Legislation
Under rapid urbanisation, land and urban governance via understanding the legal institutions and frameworks for development planning and control is essential. In this course, students will learn the historical background of urban planning law and the components of the Planning Act, and relate other laws that are relevant to urban and regional planning, such as the National Land Code 1965, the Street, Drainage and Building Act 1974, the Local Government Act 1976, and the Environmental Quality Act 1974. At the end of this course, students will be able to understand clearly the institutional rights and duties, which help them make better, informed decision with respect to the land and urban planning and development context.

SBEW3818 Industrial Training
The aim of the Industrial Attachment is to expose students to real working environments and develop the necessary skills for the job market. The Industrial Attachment 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 a maximum of twenty (20) weeks. At the end of the training, students will have to submit an industrial attachment report. Both the agency supervisor and a visiting supervisor will assess the students. Students have to pass the assessments of both supervisors as a condition for completion of the course.

SBEW 3824 Industrial Training Report
An industrial training report and reflection essay 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 task undertaken by the students during the training; comments on lessons learnt and experiences gained. Students are also required to prepare a self-reflection essay of their time with the agency. The report will be graded and students need to obtain a pass as a condition for the completion of industrial training.

SBEW4265 Studio 6: Project Planning and Feasibility (prerequisite: SBEW3255)
The studio project is designed to equip town URP students with the knowledge and ability to deal with property development of a large township. The exercise is comprehensive, covering land matters, statutory requirements, policies and procedures, site appraisals, site design, appraisal on property market trends and preparing submission documents for Planning Approvals.

SBEW4272 Undergraduate Project 1
The course is designed to equip students with basic knowledge of concepts, principles and techniques used in a research, vis-à-vis the formulation of a research problem, literature search and review, formulation of research design and methodology, determination of samples, data collection, data processing, data analysis and interpretation, norms and style of academic writing, and the presentation and defence of research. In the first semester, the course will require students to prepare and present the Undergraduate Project 1 storyboard and proposal, to prepare Chapter 1 and Chapter 2 of their dissertation, and lastly to design the research instruments.

SBEW4322 Urban Economics and Finance
Urban Economics puts economics and geography together, exploring the geographical or location choices of utility-maximizing households and profit maximizing firms. Urban Economics also identifies inefficiencies in location choices and examines alternative public policies to promote efficient choices. In this course, students will learn basic economic theories and concepts. These are followed by discussions on location theory, spatial implications of development policies, the development process and land development. The final part covers development costing and aspects of project appraisal. At the end of this course, students will be able to understand the economic and social forces that have influenced the way in which modern urban settlements have grown and developed. Students can also analyse existing urban land usage and see it as part of a diverse and on-going evolutionary process.

SBEW4332 Social Inclusion and Planning
The course serves as an introduction to the main theme of Social Impact studies. The aim of the course is to help students think more concretely about various researches related to sociological topics and issues, especially when concerned with global and international issues. Students shall broaden their knowledge of the theories of social change through an introduction to different analytical perspectives on the study of social change. An important underlying theme is the effect of economic and social restructuring on patterns of urban spatial change and social inequality in cities. Besides that, the course will also focus on conceptualisations of development and social change and on themes such as the relationship between growth and poverty, globalisation and processes of marginalisation. The course will also include presentations of relevant empirical material from research within development studies.

SBEW4284 Undergraduate Project 2
This course is a continuation of Undergraduate Project 1. It requires students to revisit Chapters 1, 2, and the research instrument(s), and make the necessary corrections/amendments, based on feedback from the respective supervisors during the first semester. Students will then proceed with their data collection, data analysis, project findings and conclusion, adhering to the norms and style of academic writing for the research/project. There will be two (2) workshops related to the research/ project management and writing of abstracts during the course. Students will present and defend their project to a selected panel, at the end of the course. By the end of the course, it is envisaged that students should be able to undertake a study scientifically and complete the study within a stipulated time satisfactorily.

SBEW4293 Planning Conference
Towards producing versatile, knowledgeable, entrepreneurial and eloquent URP graduates who are able to contribute positively to the planning profession, the professional organisation and running of a national-level planning conference will be made a partial requirement for the granting of the B.URP degree. The course is designed in conjunction with the Bachelor Project and Elective courses to provide a platform for students to share with the academia and industry important results and findings of their research projects. The course comprises of two main components: 1) collaborative planning, organisation and running of an annual conference; 2) submission, presentation and publication of planning research articles, posters or planning practice notes at the conference. The first component covers the creative setting of the main conference theme and sub-themes; effective publicity to other universities and the industry; innovative sourcing of partners and sponsors; and proper arrangements of all necessary logistics that are common to professionally managed conferences. The second component requires students to co-author and present their research results and findings in the form of 4 to 6-page planning research articles, posters or planning practice notes that are of academic journal publication standard. Selected planning research articles and practice notes will be published in the conference proceeding.

SBEW4463 Planning Theory
Knowledge on several urban planning theories is crucial for students to understand the appropriate theory to be applied based on certain circumstances. This course provides a critical assessment of core urban planning theories. It covers the typology, evolution of planning theories and critical assessment on selected planning theories and their application in planning practice. The theories include the principles that has been practiced in different countries including in the

Malaysian context. At the end of this course, students should be able to differentiate between the various principles of urban planning theories that can be applied in the planning system.

Elective Courses

SBEW3153 Social Impact Assessment
The course serves as an introduction to the main theme of the Social Impact studies. Social Impact Assessment (SIA) at the project level functions as a planning tool and an important step towards ensuring that development-related decisions and outcomes take appropriate account of social impacts on communities and individuals. This is in line with the aspiration of the government in striving to be people-centric in the process of decision making. Furthermore, the legal mandate for SIA has also been reflected under section 21A (1A) of the Town and Country Planning Act 1976 (Act 172), stating the need to include social implications in the submission of the Development Proposal Report. The importance of SIA has been extended to becoming a stand-alone study for infrastructure projects such as rail, road, industry and airport. This course gives the opportunity for students to venture into SIA studies as part of the physical development project.

SBEW4113 Environmental Impact Assessment
Environmental Impact Assessment (EIA) is an important tool for public and private development and planning decisions, for creating sustainable developments. In this course, students will learn EIA theories, methods, regulations, and its historical process. Students will also learn to assess impacts at different scales, and design, implement, and monitor mitigation measures. At the end of this course, students will be able to critically evaluate complex environmental issues and assist in the development of Environmental Impact Statements (EIA's) and the preparation, maintenance and implementation of Environmental Management Systems (EMS) in accordance with relevant environmental legislation and international standards.

SBEW3113 Critical and Creative Thinking in Planning
Being both the art and science of creating more sustainable, liveable, competitive and resilient urban settlements, urban and regional planning demands the essential critical and creative thinking ability among town planners. Critical and creative thinking in planning is especially crucial for responding to the distinctive characteristics, dynamism and diverse contexts of cities. This course encourages students to actively explore and interpret the aspects, importance, principles and methods of critical and creative thinking, and develop skills in critically analysing planning issues of an urban area towards creatively identifying context-specific planning interventions. On completing the course, students will have developed and applied the skills to systematically analyse, synthesise and logically reason various planning issues, as well as generate, justify and objectively appraise responsive planning interventions.

SBEW4153 Urban Design Framework

Urban Design Frameworks (UDF) provides a design process that shapes the built environment into great liveable places, connections, and neighbourhoods over time. The aim of this course is to provide guidance for the preparation and use of UDF; it is a strategic planning tool that sets out an integrated design vision for better future developments of urban places. An appropriate design approach will unlock the urban designer's creativity and allows physical design outcomes to be given a higher profile in planning. It also allows ideas to be tested through design and reviewed for their potential synergies and impacts. UDF are important tools to assist planning authorities to develop local action plans and initiatives within a strategic context, before being translated into real projects, policy, guidelines and initiatives. It should help to ensure that the designed built environment reflects the community's vision. This course will look into the practice of urban design, explores the physical, cultural, and experiential qualities – and future aspirations – of places, integrating the objectives of many stakeholders and the community at large.

SBEW4193 Urban Regeneration and Conservation

This course provides students with specialist knowledge on issues of urban conservation and regeneration. In order to provide a multi-disciplinary grounding in an area of growing significance for planning, tourism and urban policy, the course combines the historical study of an urban area and a conservation approach with an understanding of building architecture style, urban morphology, urban culture heritage and the principles of establishing a heritage value. This course is increasingly important as cities around the Southeast Asian region are facing the destruction of their historic urban fabric due to the rapid urbanisation process. The world seeks to simultaneously improve their economic competitiveness, ecological sustainability, social vitality and liveability while preserving and enhancing their historic, cultural characters and identity. Students will explore local current urban conservation issues and propose any potential design strategies for better conserving, regenerating, revitalising and/or other forms of intervention appropriate to the area and its context.

SBEW3163 Tourism Resource Management

The aim of the course is to provide students with an introduction and understanding of general principles and components of tourism planning and the tourism resources within it. The course discusses the relationship that exists among tourism, society, and the environment. The 'push' and 'pull' factors give the need to manage and plan a tourism destination, which is often less considered by town (or urban) and regional planner. This will enable students to appreciate and understand the concept of tourism development in either urban or rural areas, by applying inventory and evaluation techniques of tourism resources for development planning as well as the principles of sustainable tourism development.

SBEW4163 Case Study in Tourism Planning

Development of tourism planning in the economic sector was seen as the catalyst for urban regeneration. Understanding their impacts and performances is critical for sustaining as well as boosting the local economy. This course presents an opportunity for students to analyse, design, and propose an alternative approach for tourism planning. Using appropriate techniques, students also need to evaluate the pros and cons of their proposed approach,

considering various marketing, operational and implementation constraints. At the end of the course, students will be able to propose new and alternative ideas on more comprehensive tourism planning.

SBEW4173 Tourism Destination Planning
Tourism Destination Planning provides understanding on how to manage and plan tourism destinations to ensure their resilience and competitiveness. The course discusses tourism planning as a process that involves an interdisciplinary approach. It is aimed at creating vibrant, attractive, economically viable, socially responsible and environmentally sustainable tourism industries. The course also covers the understanding that tourism planning should also be integrated into the overall planning approach, system, process for the purpose of tourism analysis techniques and socio-cultural effects assessments. At the end of this course, students will be able to make informed decisions about the linkages of tourism with other sectors in boosting the local economy.

SBEW3123 Rural Settlements
Understanding the pattern of rural settlements and particular needs of the places where people live are very important for planners to provide direction for the physical development of a rural area. In this course, students will learn the issues and problems of rural settlements in Malaysia and how to differentiate the patterns and characteristics of rural settlements. This pattern can be identified on maps or using satellite images. At the end of this course, students will be able to analyse the characteristics of selected rural settlements in detail and to propose solutions for a well-planned physical development in the Malaysian rural settlements.

SBEW3173 Rural Economic Development
Understanding the process of economic transformation and how economic strategies were articulated in spatial planning is important for planners to support the economic growth in a rural region. In this course, students will learn about the analysis of trend and a step by step process on how to plan rural economic development at the local level. This course aims to equip students with a wide range understanding of related theories, issues, strategies, and prospects of economic development in the rural area specifically in Malaysia. At the end of this course, students will be able to apply the process of rural economic development by conducting a focus group discussion and come out with the strategic planning process for a case study in a rural region.

SBEW4123 Rural Community and Culture
Understanding the characteristics of the diverse rural communities, landscape and cultural traditions is important for planners to retain the communities' cultural heritage. In this course, students will learn the characteristics and principles of rural community planning and development in Malaysia. Students should be able to identify the issues, approaches, strategies and best practices of rural community development in Asian and non-Asian countries. At the end of this course, students will be able to analyse rural community issues and development programme in Malaysia.

SBEW3183 Spatial Analysis and Modelling
GIS functions relate primarily to a spatial inventory of features and the GIS analysis functions seek to help in the understanding of the patterns and processes which lie beneath the features represented in a spatial database. Spatial analysis might help students and researchers to understand a process or distribution of features, or it might help an organization make better decisions based on a more thorough understanding of the data. The aim of this course is to provide exposure and training in using various methods of spatial analysis in GIS environment. The course introduces spatial analysis tools and their modelling processes. It also allows student to familiarize with the concept of spatial decision support system and multi-criteria decision-making processes. In essence the course provides a basic understanding in the advanced application of GIS in planning and management.

SBEW3193 Geospatial Application
Geospatial application is an experiential course to provide students with the opportunity to apply GIS to real-world planning and management issues. This course integrates all the GIS skills and tools which have been learnt in the previous GIS course (Geospatial Analysis in Planning) and Spatial Analysis elective. Students will also design and customize their own project by utilizing the ArcGIS Online for Organization platform. Students will work in a team as an organization to develop proposals, conduct survey/research, analyse and evaluate alternatives, make recommendations for possible solutions and publish their data and analysis in ArcGIS Online platform based on thematic problems. Students will also be exposed to apps development and other related GIS software which could be used in preparing their project. At the end of this course, students will be able to organize their own GIS project and be equipped with advance GIS skills to be applied in urban and regional planning or other related professions.

SBEW3133 Case Study in Public Transportation
Development in public transport systems is being promoted to mitigate the urban transportation problems. Understanding the performance of public transport systems is critical for transport planners to meet the needs of commuters. This course presents an opportunity for students to analyse, design, and propose a new or an improved public transportation system. Using knowledge and skills attained from previous courses, students will also need to evaluate the feasibility of their proposed solutions considering various business and operational constraints. At the end of the course, students will be able to propose new and alternative ideas on public transportation systems and planning.

SBEW4183 Traffic Impact Assessment (TIA)
In any new developments, the newly created 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. In this course, the students will learn to conduct data collection, analyse various traffic analysis, produce a specific mitigation plan required in traffic impact assessment process and finally, produce a Traffic Impact Assessment Report (TIA). At the end of this course, students also will be able to make decisions based on the results provided in the traffic analysis performed on selected area.

SBEW3143 Climate Change and Cities

By 2050, more than 70% of the population – 6.4 billion people – is projected to live in urban areas. Cities consume a large proportion (between 60 to 80%) of the energy produced worldwide and account for a roughly equal share of global CO2 emissions. Therefore, cities with high greenhouse gas (GHG) emissions are particularly vulnerable to unprecedented global climate change, where the quality of life and sustainability are severely compromised. The course begins with establishing an understanding on interconnections among urbanisation and the cities' sectorial energy consumption, anthropogenic GHG/carbon emissions, and climate hazards. With urban planning and governance systems serving as a fundamental emphasis, as well as espousing global transformative initiatives and countries' best practices, this elective course, ultimately, aims at exposing students to identifying and formulating potential city-level spatial and non-spatial strategies, mitigations and adaptations, and policy options, including low-carbon actions, in tackling and curbing local climate change.

SBEW4133 Low Carbon Society

As our urbanised world increasingly grapples with various impacts of global climate change, LCS has become the "next big thing" in urban and regional planning. The course therefore hopes to instil awareness among would-be town planners of the vital role of urban and regional planning in creating low carbon cities and regions. This optional course aims at exposing students to fundamental concepts, modelling approaches, and mitigative actions/measures of Low Carbon Society (LCS).Apart from identifying key carbon emitting sectors of a city/region, students will apply the Asia-Pacific Integrated Model (AIM) to obtain base year carbon emission levels as a benchmark and project target year carbon emission levels under the business-as-usual (BaU) and countermeasure (CM) scenarios for a selected city. At the end of this course, students will be able to offer advice on mitigative actions and policy options that will potentially contribute to transforming cities into LCS

SBEW4143 Emergent Technologies and Urban Change

The aim of this course is to provide exposure and knowledge of current and future emergent automation and data interchange used in the industry. This course equips students with a wide-ranging understanding of the state-of-the-art technology concepts, issues, strategies and prospects in relation to urban development of a 'Smart City'. The course examines the current and future technological trends and outlooks of urban economic needs, discuss the issues and prospect of implementing these technological trends in cities and appraise urban economic change and its impact on the community. Students will also be exposed to implementation of these 'Smart Cities' and how this strategy can be articulated in spatial planning. Through this course, students are expected to improve their understanding and be able to analyse the technological trends and strategies and suggest the prospects of future urban development.

8. Bachelor of Landscape Architecture with Honours

1. Introduction

The programme was designed and implemented in 1993 and was inspired by 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 using land and water elements to create outdoor spaces which are practical and aesthetically pleasant. A landscape architect's work adds value and provides a comfortable outdoor environment in residential areas, work areas and play spaces. Landscape architecture is a discipline that covers a diverse scope of work ranging from the design of exterior landscapes within urban, rural, communal, ecological and regional areas to interior spaces. Landscape architects serve not only as designers but also to create landscapes that respond to human habitation in diverse cultural and ecological contexts.

2. Name of Award

Bachelor of Landscape Architecture with Honours [B.LArch (Hons)]

3. Philosophy

The philosophy is primarily based on the landscape architectural design and built pedagogy, which is in parallel with the needs and aspirations of the industry, society and the nation.

4. Aim

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

5. Programme Educational Objectives

The Bachelor of Landscape Architecture with Honours undergraduate program is designed to produce graduates who will be:

PEO1 Competent in solving design and project-related problems logically, creatively and analytically based on knowledge and ideas.

PEO2 Demonstrate proficiency in communication skills and other relevant soft skills.

PEO3 Competent in analysing a landscaped community and integrating the related natural and biological systems in a sustainable manner as societal responsibilities.

PEO4 Meets the landscape environment's challenges with professional integrity and ethics and acquiring lifelong learning and entrepreneurship skills.

6. Programme Learning Outcomes

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

PLO1 Describe the theoretical, philosophical, and practical dimensions of landscape architectural planning and design in relation to culture, technology, and environmental aspects.

PLO2 Apply landscape architectural knowledge in landscape design.

PLO3 Demonstrate professional commitment and competence in the practice of landscape architecture in compliance with the code of work ethics and personality.

PLO4 Perform the challenges of working in an organisation or group with interactive communication, good relationships, networking and social skills.

PLO5 Demonstrates the ability to communicate effectively with many definable facets of landscape design via visual, verbal, as well as information and communication technology (ICT).

PLO6 Illustrate the ability to use and handle information technology for landscape architectural works.

PLO7 Display-wise decisions by critically evaluating and prioritising tasks according to relevance and importance.

PLO8 Demonstrate leadership, responsibility and teamwork skills through the process of aligning and managing the challenges of working in an organisation or group.

PLO9 Act independently with limited resources and uncertain situations to acquire landscape architectural knowledge.

PLO10 Practice with the right mindset to undertake landscape entrepreneurial and management challenges.

PLO11 Demonstrates traits of an individual willing to address the borderless global issues and explore the different social, cultural, political, and institutional backgrounds

7. Accreditation

The Bachelor of Landscape Architecture degree is recognised by the Institute of Landscape Architecture Malaysia (ILAM) and the Public Services Department (JPA). Bachelor of Landscape Architecture graduates are eligible to register as graduate members with the Institute of Landscape Architecture Malaysia (ILAM).

8. Career Prospects

Graduates of the programme can work as;

1. Landscape architects
2. Research officers 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

9. Mode and Duration of Study

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

10. Classification of Courses

Courses offered under this program 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	74	58
	B. Integrated Technology	14		
	C. Man & Environment	13		
2. Elective Courses	D. Elective Courses	37	37	29
3. General Courses	E. General Courses	16	16	13
	Total credit hours to graduate		127	100

11. Award Requirements

To graduate, students must achieve a total of not less than 127 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.

12. List of Courses According To Semester (Matriculation/STPM)

Semester 1

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEZ1404 Basic Design 1	A		4	16
2. SBEZ1893 Horticulture, Nursery & Ornamental Plant Materials	C		3	
3. SBEZ1642 Design Communication	D		2	
4. SBEZ1652 Introduction to Landscape Architecture	D		2	
5. SBEZ2933 Landscape Exploration	D		3	
6. ULRS1182 Appreciation of Ethics & Civilisation*	E		2	
7. UHLM1012 Malay Language for Communication 2**	E		2	

Note: *ULRS1182 is for local students only.
**UHLM1012 is for international students only.

Semester 2

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEZ1494 Basic Design 2	A	SBEZ1404	4	16*
2. SBEZ1883 Basic Landscape Construction	B		3	
3. SBEZ1813 Site Planning	D		3	
4. SBEZ1662 Landscape Ecology	D		2	
5. SBEZ1822 Digital Landscape Representation	D		2	
6. ULRS1012 Value and Identity	E		2	
7. UHLB1112 English Communication Skills (HW)*	E		(HL)	

Note: *UHLB1112 is compulsory only for students with MUET Band 1,2, 3 and 3.5
**HW: Compulsory *Hadir Wajib* Course.

Semester 3

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEZ2505 Community Landscape and Park Design	A	SBEZ1494	5	17
2. SBEZ2903 Planting Design & Technology 1	B		3	
3. SBEZ2692 Park and Recreational Planning	D		2	
4. SBEZ2833 History of Landscape and Architecture	D		3	
5. ULRS1022 Philosophy and Current Issues	E		2	
6. UHLB2122 Professional Communication Skills I	E	UHLB1112	2	

Semester 4

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEZ2435 Urban Landscape Design	A	SBEZ2425	5	18
2. SBEZ2602 Heritage Landscape & Conservation	C		2	
3. SBEZ2612 Professional Practice 1	C		2	
4. SBEZ2642 Environmental Psychology & Socio-Culture	C		2	
5. SBEZ2722 Resource Planning & Management	D		2	
6. SBEZ4863 Event Management	D		3	
7. UHLB3132 Professional Communication Skills II	E	UHLB2122	2	

.

Semester 5

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEZ3445 Landscape Resource Planning	A	SBEZ2435	5	17
2. SBEZ3512 Advanced Landscape Construction 1	B		2	

3.	SBEZ3913 Planting Design & Technology 2	B	SBEZ2903	3	
4.	SBEZ3622 Professional Practice 2	C	SBEZ2612	2	
5.	SBEZ3843 GIS For Landscape Application	D		3	
6.	ULRS3032 Entrepreneurship & Innovations	E		2	

Semester 6

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEZ3458 Industrial Training 1 (HW) [1]	A	SBEZ3445	8	12
2. SBEZ3464 Industrial Training 2	A	SBEZ3445	4	

Note: [1] HW: Compulsory *Hadir Wajib* Course.

Semester 7

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEZ4516 Design Thesis 1	A	SBEZ3458 SBEZ3464	6	18
2. SBEZ4523 Advanced Landscape Construction 2	B	SBEZ3512	3	
3. SBEZ4852 Landscape Research	D		2	
4. SBEZ4922 Professional Mobility	D		2	
5. xxxx***3 Free Elective*	D		3	
6. UHLx1112 Elective Foreign Language	E		2	

Note: * Free elective courses to be advised by academic advisor (Free Elective Courses offered across faculty)

Semester 8

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEZ4526 Design Thesis 2	A	SBEZ4516	6	13
2. SBEZ4632 Professional Practice 3	C	SBEZ3622	2	
3. SBEZ4873 Specifications and Cost Studies	D		3	
4. ULxx2xx2 Co-Curriculum Service Learning	E		2	

Note: [1] Elective course to be advised by the academic advisor (Please refer to the Elective Courses section)
ULRS3032 Entrepreneurship & Innovation

14. Elective Courses

Course Code	Course Name
1. SBEZ1642	Design Communication
2. SBEZ1652	Introduction to Landscape Architecture
3. SBEZ1662	Landscape Ecology
4. SBEZ1813	Site Planning
5. SBEZ1822	Digital Landscape Representation
6. SBEZ2833	History of Landscape and Architecture
7. SBEZ2692	Park & Recreational Planning
8. SBEZ2722	Resource Planning & Management
9. SBEZ2933	Landscape Exploration
10. SBEZ3843	GIS For Landscape Application
11. SBEZ4852	Landscape Research
12. SBEZ4863	Event Management
13. SBEZ4922	Professional Mobility
14. SBEZ4873	Specifications and Cost Studies
15. XXXXxxx3*	Free Elective

Note: Students must complete a total of 37 credits of elective courses.
*Free elective courses to be advised by the academic advisor
(Free Elective Courses offered across faculty)

14. Syllabus Synopses

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

SBEZ1404 Basic Design 1
This course focuses on teaching fundamental design knowledge, covering principles of design and communication skills. The aim of this course is to equip students with the essential design principles and skills necessary to create and communicate visually using 2D and 3D in small-scale project-based studio works.

SBEZ1494 Basic Design 2 (prerequisite: SBEZ1404)
The studio program emphasizes the importance of considering people's needs and aligning them with the physical environment to create a sustainable human community. Its goal is to equip landscape architecture students with knowledge of community planning and design, empowering them to confidently plan and design public spaces for communities.

SBEZ1893 Horticulture, Nursery & Ornamental Plant Materials
This horticulture course provides students with an in-depth understanding of various aspects of plant life. The course covers topics such as the classification and attributes of plants, their propagation, and the soil characteristics that promote optimal growth. Students will also learn about establishing and managing nurseries.

SBEZ1642 Design Communication
The course "Design Communication" teaches students manual methods for improving their design communication skills in landscape architecture. The course covers fundamental concepts, skills, and theoretical aspects related to manual methods in landscape architecture. This provides students with a solid understanding of the topic and the ability to apply the acquired skills in a structured and effective manner.

SBEZ1652 Introduction to Landscape Architecture
This course provides an in-depth understanding of the history and current state of designed landscapes, including gardens of various sizes and styles in urban and regional settings. The course covers various schools of landscape architecture, which initially address environmental, social, philosophical, and artistic issues related to architecture and landscape.

SBEZ1662 Landscape Ecology
The course provides an understanding of the links or relationships of living organisms with natural resources and forces and how organisms interact with their environment at many levels. In addition, it allows students to understand the influence of Man on 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.

SBEZ1813 Site Planning
Site Planning 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, socio-cultural and environmental elements of site planning.

SBEZ1822 Digital Landscape Representation
Digital Landscape Representation introduces students to various digital techniques and methods in landscape architectural visualization. These comprise of virtual environments in 2D, 3D, or 4D animations. This course explores specific digital concepts and tools that can assist and is applicable at various stages of the design processes.

SBEZ1883 Basic Landscape Construction
This course offers a thorough exploration of the fundamental theories, concepts, and principles of construction within the context of landscape design. Students will acquire knowledge on the basics of building construction, including foundations, walls, and roofs. Furthermore, the module focuses on the art of creating drawings for various structures used in landscape construction.

SBEZ2505 Community Landscape and Park Design (prerequisite: SBEZ1494)
Theory and practices in community planning encompass physical, environmental, economic, and social factors in housing, economic development, social capital, citizen participation, social welfare, public safety, education, the environment and other aspects of community life. The Studio workshop and design practices are designed to address strategies and design guidelines towards a sustainable and liveable community.

SBEZ2435 Urban Landscape Design (prerequisite: SBEZ2505)
This course emphasises the aspects and theories of urban landscape design. It deals with the functions of urban spaces, their relationship and visual impact to the urban context, private or public spaces, and indoor or outdoor spaces. It requires a creative and intuitive approach, with the application of scientific principles together with technical knowledge to be formulated into guidelines for creating urban spaces suitable for places to live, work and play. It also involves aspects such as the economic, social and cultural factors of the people in creating a conducive and safe environment.

SBEZ2903 Planting Design & Technology 1
Planting Design and Technology 1 is a three-credit hour course designed to provide a basic understanding of planting design in order to develop cultural sensitivity in the design of landscapes. This course focuses on local ethnobotanical plants which are identified, evaluated and chosen in designated spaces according to their function, aesthetic qualities and intrinsic values. The discussion focuses on the influence of cultural and religious/belief factors in the selection of plants, and their application in landscape design in order to develop students' critical and analytical minds.

SBEZ2692 Park and Recreational Planning
The Park and Recreational Planning course serves as an introduction to the theory of park planning and design. It covers the theoretical aspects of planning and park design, including historical development, principles, concepts, philosophies, beliefs, perceptions, needs, and site potential. The course also emphasizes the comprehension of planning and park design theories and current issues awareness.

SBEZ2833 History of Landscape and Architecture
The History of Landscape and Architecture offers a thorough understanding of the landscape architecture and architecture of the past and how they relate to the present. It covers gardens and buildings that are historical, traditional, and classical in character. Initially, the course focuses on various traditional schools of thought and practices that address environmental, social, and philosophical premises, as well as artistic expressions related to architecture and landscape.

SBEZ2602 Heritage Landscape & Conservation
The Heritage Landscape and Conservation course deals with an appreciation of the philosophy of conservation and the historic environment, and garden and landscape history including literary and artistic associations. It then addresses the four general types of cultural landscapes worldwide, not mutually exclusive, all of which require management: urban landscapes, designed landscapes, vernacular landscapes, and relict landscapes including World Heritage Sites.

SBEZ2612 Professional Practice 1
Professional Practice 1 is a two-credit hour course designed as an introduction to the landscape professional practice. As part of the “Man and the Environment” group of the curriculum, the course introduces and exposes the standards of professional practice to students, as well as the roles and responsibilities of the landscape architect, and the management and organization of the practice.

SBEZ2722 Resource Planning & Management
Resource Planning and Management is a two-credit hour course that focuses on landscape resource planning and management. The course focuses on the natural and cultural aspects of landscape resources. It emphasizes on the management and planning of landscape resources including soil, geology, water, flora and fauna, land use, land ownership, history, socio-economy, climate, infrastructure and visual quality. The course also introduces Geographical Information Systems (GIS) integrated with resource analysis techniques to generate ideas for landscape planning.

SBEZ2642 Environmental Psychology & Socio-Culture
The Environmental Psychology and Socio-Culture course explores the nature and nuances of interrelationships between people and their surroundings by examining an array of critical issues in environmental psychology. Here, the environment is broadly defined to include not only our physical surroundings (both natural and built), but also the larger, socio-cultural and political milieu in which we live. Starting with foundational theories on place attachment and place identity, the course covers classic issues that help inform urban ecological design, such as relationships to nature, landscape preferences, personal space, territoriality, and crowding.

SBEZ2933 Landscape Exploration
This course consists of two components:
Competition is a three-credit hour non-lecture-based course which addresses the need for a non-academic way of teaching and learning. It provides the opportunity for students to test their ability to compete and win design or landscape architectural competitions, individually or in a group.

Expedition is a three-credit elective course focusing on the development of interpersonal and team-building skills to achieve a common goal, which is in the form of an expedition. The expedition or event can manifest either solely as outdoor activities such as mountain hiking, island hopping, jungle trekking, cycling, rafting, kayaking and cave exploration, or it can be integrated as part of a larger program, such as volunteering and campaigning.

SBEZ3445 Landscape Resource Planning
This course focuses on the natural and cultural aspects of landscape resources. It emphasizes on the management and planning aspects of landscape resources including soil, geology, water, flora and fauna, land use, land ownership, history, socio-economy, climate, infrastructure and visual quality.

SBEZ3512 Advanced Landscape Construction 1
Advanced Landscape Construction 1 is a two-credit hour course. It is an advanced technical subject focusing on the theoretical and constructional know-how of site grading and drainage. The course is intended to impart knowledge on grading as an integral part of the design process, which ensures that site planning of the design components recognizes and enhances the landscape quality. The learning outcomes stated below are structured into three modules, namely: [1] Visual Expressions, [2] Working with Contours and Elevations, and [3] Grading Solutions. The first module introduces the visual communication standards of grading in landscape construction.

SBEZ3913 Planting Design & Technology 2 (prerequisite: SBEZ2903)
Planting Design and Technology 2 is a three-credit hour course designed as a continuation of Planting Design & Technology 1 (SBEZ2903). Plants are important elements of the landscape, either as a design element in its physical form or in its ecological role in the environment by virtue of being living organisms.

SBEZ3622 Professional Practice 2 (prerequisite: SBEZ2612)
Professional Practice 2 is a two-credit hour course designed as a continuation of Professional Practice I with a focus on the overall aspects of contract administration for landscaping works. This subject exposes students to an understanding of the construction industry as a whole. It explains the role of the parties involved, particularly the landscape architect, in the construction industry; and the processes involved in the project management of a construction project. Students are exposed to the field services of a landscape architect as a project manager, other than being the designer. This subject touches on issues related to ethics and professional conduct.

SBEZ3843 GIS for Landscape Application
GIS for Landscape Application is a 2-credit hour course which aims to extend knowledge on landscape resource management. The subject is designed to develop an understanding of the Landscape Planning Process and skills in surveying, analysing and evaluating data using appropriate methods. The course concentrates on the understanding of technical tools (software and process) to support the decision-making process in landscape resource management.

SBEZ3458 Industrial Training 1 (prerequisite: SBEZ3445)
The course titled Industrial Training 1 spans eight credit hours and offers students valuable hands-on experience in the field of landscape architecture. Through a combination of engaging projects, fieldwork, and the creation of landscape plans for various sectors, students can attain a thorough grasp of the subject matter and its real-world applications. Upon completing this course, students can expect to possess a comprehensive understanding of landscape architecture and its practical implications across diverse sectors.

SBEZ3464 Industrial Training 2 (prerequisite: SBEZ3445)
This course requires students to produce a technical report reflecting their experience and knowledge gained during involvement in various development projects and problem-solving activities, field work (such as inventory, analyse data and design), and landscape development plan (e.g., residential, institutional, industrial, business, recreation and tourism). After completing the report, students should be able to present information and express ideas clearly, effectively and confidently.

SBEZ4516 Design Thesis 1
Throughout the course, students will have the opportunity to showcase their expertise in Landscape Architecture by combining their knowledge, understanding and skills. With the guidance of the lecturer, they will be able to select a topic and location that intrigues them. Students will conduct extensive research and develop a design thesis that advances from the problem statement phase, where they will address the identified issues, analyze case studies and references, and create design guidelines or theories to solve the problems at hand.

SBEZ4526 Design Thesis 2
The Final Comprehensive Project serves as the ultimate assessment of a student's capability to integrate diverse knowledge, understanding, and skills in a quasi-professional manner. Its primary objective is to evaluate the comprehensiveness, sensitivity, and creativity in approaching an environmental design solution. Essentially, it tests the student's ability to create a well-rounded and effective design solution.

SBEZ4523 Advanced Landscape Construction 2 (prerequisite: SBEZ3512)
Advanced Landscape Construction 2 is a three-credit hour course which is intended to impart knowledge and skills on the requirements of technical construction documentation and techniques during design, working drawings, and construction stages in the design process. This course emphasises advanced technical knowledge, focusing on theoretical as well as construction know-how of pools and fountains, outdoor lighting and irrigation.

SBEZ4922 Professional Mobility
The Professional Mobility program provides an exceptional opportunity for students to broaden their horizons by gaining enriching experiences and knowledge beyond what is available through their local culture and university curriculum. This short-term design exposure is co-organized with external organizations, enabling students to explore new and diverse learning environments. The course offers a unique chance to expand horizons, develop new skills, and gain valuable insights into different cultures and ways of thinking.

SBEZ4863 Event Management
Throughout the course, students will have the chance to learn how to organize a seminar or related activities and build professional relationships. The main goal of the course is to improve students' understanding of the systematic process of seminar organization, including the ability to gather critical resources and make informed decisions. The course also emphasises developing generic skills through collaborative teamwork and effective communication with external parties.

SBEZ4852 Landscape Research
In this course, students will learn a comprehensive framework that focuses on enhancing their design thinking capabilities and developing a sound rationale for their ideas. The course will introduce them to a systematic approach to conducting research and gathering relevant data, which will enable them to formulate strong and well-supported arguments. By the end of the course, students will have gained essential skills in research and analysis, enabling them to create more effective and innovative design solutions.

SBEZ4632 Professional Practice 3 (prerequisite: SBEZ3622)
The aim of this course is to provide students with a fundamental understanding of landscape management practices. The subject primarily concentrates on theories related to management and maintenance in landscape work operations. Students will be presented with practical examples through case studies. The course will also cover the responsibilities of landscape architects in managing crucial resources such as manpower, financial sources, materials, equipment, and facilities involved in landscape operations.

SBEZ4873 Specifications and Cost Studies
The course aims to teach students about cost estimation methods for landscape projects and raise awareness about their current applications. Additionally, the course helps students learn how to properly specify landscape materials using standard practices and methods. This knowledge can be applied to current landscape architectural projects through various methods such as learning, research, case studies, discussions, and assignments.

9. Bachelor of Science in Construction with Honours

1. Introduction

Modern construction projects are renowned for their intricacy in design and swiftness in execution, demanding a substantial allocation of resources including materials, labour, machinery, and finances. These projects often unfold in an environment of resource scarcity and grapple with the uncertainties related to resource availability. Delays in construction work can lead to escalating costs, given the intricate time-cost dynamics inherent to each project. Consequently, the imperative of effective planning and management within the construction sector cannot be overstated.

The Bachelor of Science in Construction with Honours curriculum has been meticulously crafted to furnish students with a robust academic foundation and professional acumen in the realm of construction management. It is uniquely positioned to address both the current challenges and the evolving demands of the construction industry. To thrive in this industry, students must cultivate a profound comprehension of the technical facets of construction, while concurrently applying cutting-edge construction management practices and tools. The program underscores the importance of grasping construction technology, construction management methodologies, and production management processes. Furthermore, it equips students with the essential generic skills and competencies that empower them to excel in a competitive employment landscape.

This comprehensive program integrates a blend of engineering technology, construction techniques, and management principles, all strategically designed to prepare graduates for leadership roles in the construction industry. Beyond academic knowledge, it nurtures a professional and ethical mindset among students, fostering their personal growth, self-esteem, and career aspirations. Graduates emerge not only as adept professionals but also as well-rounded individuals ready to make a lasting impact in the world of construction management.

2. Name of Award

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

3. Philosophy

The philosophy of the Bachelor of Science in Construction program is centred on equipping students with a comprehensive education in construction technology and management. This holistic approach is aimed at empowering our students to emerge as proficient professionals capable of assuming vital roles in the construction industry, including project management, project planning, and even entrepreneurship as construction contractors. Our overarching goal is to cultivate individuals who can effectively address and contribute to the evolving needs of our nation's construction sector. Through a blend of academic coursework and hands-on practical experiences, we prepare our students to play a pivotal role in fulfilling the demands and aspirations of our country's construction landscape.

4. Aim

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

5. Programme Educational Objectives

Bachelor of Science in Construction with Honours has 5 programme educational objectives:

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

PEO2 To produce graduates who are effective problem solvers, 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 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 graduates with basic communication skills, lead effectively and be able to work collaboratively in a multidisciplinary team.

6. Programme Learning Outcomes

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

PLO1 Comprehend the fundamental concept and knowledge in principles and practice of construction management, construction technology and other related areas.

PLO2 Appraise information, concept, and theories to resolve issues in the practice of construction management, construction technology and other related areas.

PLO3 Select appropriate methods and procedures to solve practical matters through a range of forefront technical approaches, skills and ideas.

PLO4 Adhere to the role as a team member and to work collaboratively in various environments ethically and professionally.

PLO5 Communicate effectively with others at all levels including management, multidisciplinary teams, and diverse individuals.

PLO6 Demonstrate digital literacy skills through a broad range of information, media and related technology applications.

PLO7 Apply numerical and graphical data through statistical tools in work and research related applications.

PLO8 Display leadership, autonomy and responsibility in managing duties within a broad organisation.
PLO9 Engage in self-directed life-long learning initiatives to ensure self-advancement in professional development.
PLO10 Integrate entrepreneurial knowledge with technical skills to identify opportunities in projects.
PLO11 Perform professional responsibilities in accordance with stipulated legal, ethical and codes of practice.

7. Accreditation

The Bachelor of Science in Construction with Honours is recognised by the Public Services Department and Malaysian Qualification Agency (MQA). Graduates from this programme are eligible to register with the Malaysian Board of Technologist (MBOT), Chartered Institute of Building (CIOB) and Board of Quantity Surveyors Malaysia (BQSM) through various categories of registrations such as Graduate Technologist, and Quantity Surveyor Technologists (QST) after fulfilling required conditions. To enhance graduates' career development, they are eligible to apply as Certified Construction Manager (CCM) and Certified Construction Project Manager (CCPM) training skills by the Construction Industry Development Board (CIDB).

8. Career Prospects

Graduates of the programme can work as:
1. Construction Project Managers
2. Construction Manager
3. Construction Project Planners
4. Construction Site Superintendents
5. Construction Health and Safety Officers; and other comparable and relevant posts in the construction industry

9. Mode and Duration of Study

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

10. 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	15	76	60
	B. Measurement & Documentation	6		
	C. Professional Practices	17		
	D. Economics & Finance	8		
	E. Legal & Contractual Studies	6		

Classification	Course Group	Credits	Total credit	Percentage
	F. Construction Science	8		
	G. Management	8		
	H. Information & Communications Technology (ICT)	2		
	I. Research & Development	6		
2. Elective Courses	J. Elective Courses	35	35	27
3. General Courses	K. General Courses	16	16	13
	Total credit hours to graduate		127	100

11. Award Requirements

To be eligible to graduate from this programme, students must achieve a total of not less than 127 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.

12. List of Courses According to Semester (Matriculation/STPM)

Semester 1

Course	Course Group[1]	Prerequisite	Credit	Total Credit
1. SBEC1113 Construction Technology I	A		3	13*
2. SBEC1312 Introduction to Built Environment	C		2	
3. SBEC1132 Draughtsmanship	A		2	
4. SBEC1412 Principles of Economics	D		2	
5. SBEC1862 Introduction to Information Technology	H		2	
6. ULRS1182 Appreciation of Ethics and Civilisations (Local & International)	K		2	
7. UHLM1012 Malay Language for Communication 2 (International)[1]			2	

Note: *Total sum of credit hours for local students. The total sum of credit hours for international students will consider an additional 2 credit hours for UHLM1012

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEC1123 Construction Technology II	A		3	15*
2. SBEC1253 Introduction to Construction Measurement	B		3	
3. SBEC1152 Building Services I	A		2	
4. SBEC1513 Principles of Law, Contract & Tort	E		3	
5. SBEC1192 Construction Materials[1]	J		2	
6. SBEC1712 Facilities Management[1]				
6. UHLB1112 English Communication skills[2] (HW)	K		HL	
7. ULRS1012 Value and Identity			2	

Note: [1]Elective courses to be offered, choose 2 credits. Elective courses will be advised by the Programme Coordinator.
[2]Compulsory for MUET Band 3.5 and below (HW) : Compulsory Audit Course.

Semester 3

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEC2223 Construction Measurement I	B	SBEC1253	3	17
2. SBEC2162 Building Services II	A		2	
3. SBEC2612 Principles of Structures	F		2	
4. SBEC2662 Engineering Survey[1]	J		2	
5. SBEC2532 Land Law[1]			2	
6. SBEC2732 Financial Management[1]			2	
7. SBEC2742 Construction Safety[1]			2	
8. ULRS1022 Philosophy and Current Issue (Local)	K		2	
9. UHLB2122 Professional Communication Skills I		UHLB1112	2	

Note: [1]Elective courses to be offered, choose 6 credits. Elective courses will be advised by the Programme Coordinator.

Semester 4

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEC2463 Cost Studies	D		3	17
2. SBEC2523 Construction Contract & Procedures	E	SBEC1513	3	
3. SBEC2722 Principles of Management	G		2	
4. SBEC2233 Construction Measurement II[1]	J		3	
5. SBEC2542 Construction Procurement & Dispute Resolution[1]			2	
6. SBEC2912 Introduction to Statistics[1]			2	
7. UHLB3132 Professional Communication Skills II	K	UHLB2122	2	
8. ULRF2XX2 Service Learning Co-curriculum[2]			2	

Note: [1]Elective courses to be offered, choose 5 credits. Elective courses will be advised by the Programme Coordinator.
[2]Elective courses to be offered by Co-Curriculum Service Learning Centre

Semester 5

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEC3173 Civil Engineering Construction	A		3	18
2. SBEC3433 Estimating & Tendering	D		3	
3. SBEC3633 Planning & Scheduling	F		3	
4. SBEC3753 Construction Project Management	G		3	
5. SBEC3852 Information Technology Applications in Built Environment	J		2	
6. UHLX1112 Foreign Language Elective	K		2	
7. ULRS3032 Entrepreneur and Innovation			2	

Semester 6

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEC3328 Industrial Training (HW)[1]	C		8	12
2. SBEC3334 Industrial Training Reports	C		4	

Note : [1]HW : Compulsory Audit Course.

Semester 7

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEC4643 Construction Plant and Temporary Works	F		3	17
2. SBEC4763 Construction Site Management	G		3	
3. SBEC4932 Undergraduate Project I	I		2	
4. SBEC4653 Construction Technology & Design[1]	J	SBEC2612	3	
5. SBEC3552 Construction and Development Law[1]			2	
6. SBEC4182 Sustainable Construction[1]			2	
7. SBEC4772 Commercial Management[1]			2	
8. SBEC4832 Construction Information Technology[1]			2	

Note: [1]Elective courses to be offered, choose 9 credits. Elective courses will be advised by the Programme Coordinator.

Semester 8

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEC4343 Project Planning and Implementation	C	SBEC3633 SBEC3753	3	18
2. SBEC4944 Undergraduate Project II	I	SBEC4932	4	
3. SBEC4242 Construction Measurement (Civil Engineering Works) [1]	J		2	
4. SBEC4442 Development Economics[1]			2	
5. SBEC4452 Value Management[1]			2	
6. SBEC4562 International Contracting[1]			2	
7. SBEC4842 Intelligent Construction[1]			2	
8. XXXXXXXX Free Elective[1]			3	

Note: [1]Elective courses to be offered, choose 11 credits. Elective courses will be advised by the Programme Coordinator.

13. Syllabus Synopses

The syllabus synopsis below covers 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 programme coordinator before enrolling into any of these elective courses.

SBEC1113 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 stories high. It examines the processes and techniques related to the construction of substructures, frames, enclosure and finishes for low-rise domestic and commercial buildings. The course also introduces students to the Uniform Building by Laws (UBBL). The course provides 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 ability to work effectively as a team member to achieve mutual objectives.

SBEC1312 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 objectives.

SBEC1132 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.

SBEC1412 Principles of Economics
This course provides students with the basic understanding of 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 objectives.

SBEC1862 Introduction to Information Technology
This course is designed as an introduction to word processing, spreadsheet, database and presentation software. It also provides students with experience in using relevant software and helps them develop skills in the use of the software for various tasks. The course also enables students to develop their own word processing documents, spreadsheet and database.

SBEC1123 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 examines 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 provides 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 objectives.

SBEC1253 Introduction to Construction Measurement
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 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.

SBEC1152 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 covers the common building service systems 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 objectives.

SBEC1513 Principles of Law, Contract & Tort
The aim of this course is to provide students with basic principles of law. The objectives are to introduce the main principles of the Malaysian legal system, to elucidate certain specified principles of the law of tort, agency and sale of goods relevant to construction works and to instil good understanding of the principles of 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.

SBEC2223 Construction Measurement I (prerequisite: SBEC 1213)
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 focuses on the application of the principles of measurement and quantification of low-rise building works.

SBEC2162 Building Services II
The aim of this course is to provide knowledge and understanding of the various building and infrastructure services. This course covers the common building and infrastructure services system and equipment. 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 member to achieve mutual objectives.

SBEC2612 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.

SBEC2722 Principles of Management
This course provides knowledge and develops the understanding of the principles of management including the current changes and developments. It emphasises on 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 students' ability to create good relationships, interact with colleagues and work effectively with other people to achieve mutual objectives.

SBEC2463 Cost Studies
The course covers 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 design economics 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 cost implications of design variable, construction methods, local authority regulations, and site conditions etc. The course also provides the environment to develop students' communication skills and the ability to work effectively as a team member to achieve mutual objectives.

SBEC2523 Construction Contract & Procedures (prerequisite: SBEC 1513)
The aim of this course is to introduce to the students the important clauses in construction contracts. The objectives are: one; to explain to the students the principles and the implications of the main terms of construction contract, and 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 objectives.

SBEC3173 Civil Engineering Construction
The aim of this course is to develop an understanding of civil engineering structures and special constructions. The course will provide students with skills to allow for 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 objectives.

SBEC3433 Estimating & Tendering
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 building works based on the various methods and techniques and to build up rates. By identifying the factors that influence cost, 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 objectives, and to seek information from various sources.

SBEC3633 Planning & Scheduling
This course enables students to develop an understanding and critical appreciation of the theory and practice of planning, scheduling, and reporting for a project through the use of bar charts and critical path methodology. The course provides students with a thorough understanding of project planning and scheduling principles in the construction industry. It introduces various planning and control techniques in an integrated planning and control system. It helps students develop understanding of time, cost, and resource management principles as well as an overview of advanced project planning concepts. This course also provides the environment to develop students' ability to work effectively as a team member to achieve mutual objectives, and to seek information from various sources.

SBEC3753 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 further develop their knowledge in the theory and practice of construction management. It includes the theoretical and practical aspects of material, labour, plant, sub-contractor, time, cost, quality and risk management. The course also goes into detail about the process of construction, the 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.

SBEC3328 Industrial Training (HW Compulsory Audit Course)
This course aims to provide students with industry experience and to consolidate the theoretical content from the course by exposing students to real construction industry scenarios 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 learnt. Students should 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 beliefs of others.

SBEC3334 Industrial Training Reports
This course requires the students to produce a report on the industrial training carried out. The report covers tasks undertaken and experiences gained by students during the period of training at the respective firms or departments. After completing the report, students should be able to present information and express ideas clearly, effectively and confidently.

SBEC4643 Construction Plant & Temporary Works
This course provides working knowledge on construction plants and temporary structures. Topics include an introduction to principles and techniques for selecting and managing construction equipment, review and evaluation of the types of earthmoving and other construction equipment, including estimating and analysis of production, ownership and operating costs. Studies of temporary structures used to support construction operations such as formwork, scaffolding systems, shoring systems, cofferdam, underpinning, slurry walls and construction dewatering systems are also covered. Upon successful completion of this course, students' will develop a working knowledge of common construction plants and equipment and their management imperatives and techniques. Students should understand the different types of temporary structures used to support construction and to identify alternative solutions for temporary structure designs.

SBEC4763 Construction Site Management
This course provides students with knowledge, understanding and skills of site management based on best practices. It covers the elements of site analysis, site planning and layout, organising resources, site communication and information, site meeting and housekeeping. This course also covers the aspects of site procedures, method of construction techniques, law, rules and regulations.

SBEC4932 Undergraduate Project I
This course is designed to provide the knowledge and skills 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 a research process and prepare a research proposal. Students should be able to seek information from a variety of sources, be open to new ideas and have the capacity for self-directed learning, to look for alternative ideas and solutions, present information and express ideas clearly, effectively and confidently, and act ethically with integrity and social responsibility.

SBEC4343 Project Planning & Implementation (prerequisite: SBEC 3633 & SBEC 3753)
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. In so doing, the students are expected to understand the concept of project management as a truly integrated approach to the process of building. This course provides a premise for students to integrate and apply other related disciplines studied in the previous years to the PED projects. At the same time, they will have the opportunity to explore problems of managing temporary organisations whose members are professionals in differing fields with differing objectives and perspectives.

SBEC4944 Undergraduate Project II (prerequisite: SBEC 4932)
This course is a continuation of Research Method (SBQ 4712) and requires students to undertake a dissertation project based on the research proposal prepared in Research Method. At the end of the course, 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 the research undertaken and prepare a clear and systematic dissertation report. Students should be able to seek

information from a variety of sources, be open to new ideas and have the capacity for self-directed learning to look for alternative ideas and solutions, present information and express ideas clearly, effectively and confidently and act ethically with integrity.

SBEC1192 Construction Materials
The overall aim of this course is to introduce students to the properties and behaviour of common materials used in the construction and methods of drafting specification. It is intended to enable students to be conversant with building materials and typical methods of specification writing. This course covers the details on construction materials including classification, sources, manufacturing processes, 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 objectives.

SBEC1712 Facilities Management
This course introduces students to various building components, understanding various basic systems and functions of building components and their integration with the building system, concept of facilities management and its application in various organisations 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 objectives.

SBEC2532 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 objectives.

SBEC2732 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 objectives.

SBEC2742 Construction Safety
This course addresses issues, concepts, legislation and practices pertinent for effective construction health and safety management. It serves to develop a critical understanding of the requirements and practice of construction safety management. The course also provides a platform to develop students' communication skills and the ability to work effectively as a team member to achieve mutual objectives.

SBEC2233 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 further develops the knowledge, understanding and 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 focuses 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.

SBEC2542 Construction Procurement & Dispute Resolution
This course is designed to provide students with knowledge and understanding on the concept of the various construction project delivery systems and dispute resolution that are adopted in the construction industry. In terms of construction project delivery systems, the students will be exposed to the traditional, turnkey, design and build, PFI, PPP and relationship-based delivery methods such as partnering and alliance used in Malaysia and other countries. The emphasis is on the legal and strategic aspects of the various delivery systems against the background of the project requirements, clients' needs, risk allocation and current construction practices. In terms of the dispute resolution methods, exposure is given to the various methods of dispute resolution that are being utilised in the construction industry as alternatives to litigation which include adjudication, mediation, dispute review board and arbitration. The course also examines the process, procedures, relevant clauses and legal implications in the various methods used to resolve disputes.

SBEC2662 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 emphasises 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. 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 objectives.

SBEC2912 Introduction to Statistics
The aim of this course is to provide students with an understanding of mathematical methods and analysis techniques. Basic statistical concepts and methods are presented in a manner that emphasizes understanding of the principles of data collection and analysis. Much of the course is devoted to discussions of how statistics is commonly used and applied correctly in the research.

SBEC3552 Construction & Development Law
The aim of this course is to provide knowledge on 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. To students it provides them with a general understanding of the laws and develops students' ability to apply the legal principles in construction and development law.

SBEC3852 Information Technology Applications in Built Environment
This course is designed to enable students to create business applications with simple programming or scripting language. This course provides problem solving and computer programming skills for students with no prior experience in the area of programming. Students will be using coding language i.e. Phyton, Visual Basic, Java and object-oriented computer programming language to learn the fundamentals of computer programming including how to write, compile and execute programs.

Free Elective
Relevant free elective courses will be offered to meet the curriculum needs in accordance to the latest industry trends.

SBEC4242 Construction Measurement (Civil Engineering Works)
The aim of the course is to equip students with the knowledge and skills of measurement and quantification of civil engineering works to complement the needs of the profession. This course further provides the knowledge, understanding and skills of measurement of civil engineering works according to the Malaysian Civil Engineering Standard Method of Measurement (MyCESMM) for the purpose of preparation of bills of quantities and estimating. The course focuses on the application of the principles of measurement and quantification of infrastructure and civil engineering works.

SBEC4653 Construction Technology & Design (prerequisite: SBEC2612)
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. 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 and implications of soil properties to foundation choices and designs. Appropriate codes and specifications, methods for selecting structural elements and foundations are studied and practiced. The relationship of structural framing and foundation plans, details and shop drawings to specific learning topics are also covered. The course provides the platform to

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

SBEC4442 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 and the property development process, identify the factors to be taken into consideration in development appraisal for different types of property and development control; prepare simple development appraisals using the residual and cash flow methods, and identify the different types and sources of development finance. The course also provides the platform to develop students' communication skills.

SBEC4772 Commercial Management
The aim of this course is to develop students' knowledge and understanding on the principles of commercial management from inception to completion from the construction organisations' perspective. This course is designed to provide students with knowledge and skills related to financial and contractual issues to maximise the profitability of a project. Topics covered include commercial management in project-oriented organizations, developing business networks and managing clients, cost evaluation, invoicing and management of cash flow, and teamwork and partnering. The course also provides the platform to develop students' communication skills and the ability to seek information from various sources.

SBEC4182 Sustainable Construction
This course explores the primary interface between sustainable technologies and high technology buildings. It deals 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 developments and natural resource management. Site study visits will be undertaken to local sustainable and high technology buildings under occupation and under construction. The course also provides the platform to develop students' communication skills.

SBEC4452 Value Management
This course introduces 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 function analysis system technique. At the end of the course, 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. Students should be able to function and communicate effectively in a team and demonstrate leadership skills.

SBEC4562 International Contracting
This course is designed to provide knowledge and understanding for students regarding the legal principles in relation to international contracting. The scope of this course encompasses an overview of the unique problems faced by firms engaging in international activities; the importance of understanding foreign economic, social, political, cultural and legal environments; joint ventures, international dimensions of management, marketing and accounting, international financial management; international standard forms of contract; recent problems of the international economic system; dispute resolution and contracting risk analysis. The course also provides the platform to develop students' communication skills.

SBEC4832 Construction Information Technology
This course enhances student's knowledge and understanding of information technology applications in the construction industry. The emphasis of the course is to enable students to understand the importance of information and communication technology in the construction industry. This course covers the use of information and communication technology in the construction industry, its development and its strategic implementation.

SBEC4842 Intelligent Construction
This course is designed to provide students with the knowledge and skills in adopting process and technology innovation in the various stages of project development. Topics covered include artificial intelligence techniques and tools, GIS, wireless technology, knowledge work system and smart and green buildings. The concept of electronic site measurement is also introduced in order to enhance the process of site valuation and measurement of the changes in construction. The course also provides the platform to develop students' communication skills and the ability to seek information from various sources.

10. Bachelor of Science in Geoinformatics with Honours

1. Introduction

Geoinformatics is the art and science of gathering, processing, manipulating, managing, disseminating and applying geospatial (geographic related) data. The Bachelor of Science in Geoinformatics with Honours programme is intended to produce professionals who are capable of using geospatial and information technology (IT) to handle geographic information for the economic, social and physical development of the country.

Numerous fields benefit from geoinformatics, including urban planning and land use management, in-car navigation systems, public health, environmental modelling and analysis, military and business location planning, architecture, archaeological reconstruction, telecommunications, and criminology and crime simulation. The spatial dimension's significance in analyzing, monitoring, and modelling numerous key challenges associated with sustainable natural resource management is well acknowledged around the world. Geoinformatics has developed various solutions for decision-makers across a broad range of disciplines, industries, the commercial sector, environmental agencies, local and national government, research institutions, and national survey and mapping organizations.

2. Name of Award

Bachelor of Science in Geoinformatics with Honours [BSc Geoinformatics (Hons)]

3. Programme Recognition

The programme, approved and recognized by the Ministry of Higher Education (MOHE) and the public Services Department (PSD), was first offered in the academic year of 1993/94. The extract of the letter from the PSD [JPA(L)S.130/2/1 Jld.4(97)] in recognizing the programme is as follows:

“The Permanent Committee of Evaluation and Qualification Recognition (JTPPK) in its 79th meeting on July 2nd 2002 chaired by The Honourable Education Minister of Malaysia had recognized the degree of Bachelor of Science (Geoinformatics) of Universiti Teknologi Malaysia as equivalent to the Bachelor of Science with Honours from other local Higher Learning Institutions for any appointment to the Public Services, Malaysia”.

4. Aim

The aim of the programme is to produce graduates that have knowledge in geoinformation science, competent in handling geospatial information as well as being ethical and able to contribute to the development of the country.

5. Programme Educational Objectives

The Programme Educational Objectives are as follows:

PEO1 Knowledgeable, creative and innovative in solving geospatial related problems by benefiting information and communication technology.

PEO2 Good interpersonal skills with continuous effort towards career advancement through good quality leadership, lifelong learning and business opportunities.

PEO3 Demonstrate professionalism and uphold ethical values within organisation and society.

6. Programme Learning Outcomes

The intended learning outcomes of the Bachelor of Science in Geoinformatics with Honours programme are:

PLO1 Ability to demonstrate knowledge in geospatial field.

PLO2 Ability to apply the knowledge in the form of theory and skill in geospatial field.

PLO3 Ability to manage and analyse related data and information for specific purposes Geospatial field.

PLO4 Ability to adapt in different situation of Geospatial-based industrial needs.

PLO5 Ability to communicate effectively delivering geospatial technical information

PLO6 Ability to use related technology and software for geospatial information and application in a competent manner.

PLO7 Ability to analyse numerical information for making accurate decision and conclusion.

PLO8 Ability to work in a multi- disciplinary team for nurturing leadership skills.

PLO9 Ability to independently grasp the new development of Geospatial field by adapting to latest technology.

PLO10 Ability to identify and apply business opportunities and entrepreneurial skill in geospatial-related projects.

PLO11 Ability to act professionally and according to the correct ethical skills in dealing with current and global issues.

7. Accreditation

The Bachelor of Science in Geoinformatics with Honours (Previously known as Bachelor of Science (Geoinformatics) is recognised by Malaysian Qualification Agency (MQA) with MQR reference No.MQA/SWA0774.

https://www2.mqa.gov.my/mqr/english/epapar_printAA.cfm?IdAkrKP=16283
The programme is also accredited by the Malaysia Board of Technologists (MBOT). The extract of the letter from the Technology and Technical Accreditation Council (TTAC), MBOT in recognizing the programme is as follows:
"Pleased to be informed that MBOT has approved the application for Full Accreditation of the following program and has been certified to have met the accreditation assessment criteria of TTAC MBOT's professional program in accordance with the provisions of the Technologists and Technicians Act 2015 (Act 768) which qualifies graduates of this program to be registered as Qualified Technicians (QT)/Graduate Technologists (GT) under MBOT".
The programme code accreditation is MBOT/FA/RB/0/02/0001. The accreditation is applicable to cohorts graduating in 2023 until 2026.

8. Career Prospects

Graduates of the programme may work as GIS professionals at various government and private organizations. Among the posts that can be held are:

1. Jurugeospatial (Gred J41 - Gred J52) - Government Public Sector
2. Geospatialist
3. GIS/Remote Sensing Manager
4. Geospatial Data Scientist
5. GIS Analyst
6. Geospatial Database Administrator
7. GIS Programmer/Application Developer
8. GIS/Remote Sensing Project Manager
9. GIS/Remote Sensing Project Consultant
10. Web Developer

Agencies may require the service of these graduates include:

1. Government departments that are directly related to geospatial data management such as Department of Surveying and Mapping Malaysia (JUPEM), Malaysian Centre for Geospatial Data Infrastructure (MaCGDI) and Malaysian Remote Sensing Agency (ARSM).
2. Government departments that use geospatial information in their daily operation such as Forestry Department, Department of Agriculture, Public Works Department, Department of Environment, Department of Town and Regional Planning and Civil Aviation Authority of Malaysia (DCA)
3. Organizations that are involved in utility works among which include the Water Supply, Telekom Malaysia (TM), Tenaga Nasional Bhd (TNB) and Petroliam Nasional (PETRONAS).

4. Organization that are involved in road infrastructure such as PLUS and Prolintas.
5. Local Authorities and Municipalities (City Hall, City Council, Municipal Council and District Council).
6. Retail Companies such as AEON
7. Private companies dealing with data acquisition and processing such as land surveying firms, software vendors and digital data providers.
8. Higher learning institution (UTM, UM, UKM, UPM, USM, UiTM, UMP, UMK and Polytechnic)
9. Other land-related agencies.

The service of GIS professionals is becoming more important as more demands for geospatial data handling are emerging due to the rapid growth of the country's development. The graduates of this programme can expect a very good future in their career and can always play their role in fulfilling such demands.

9. Mode and Duration of Study

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

10. 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. Geoinformation Science	26	75	59
	B. Surveying and Mapping Science	20		
	C. Physics, Mathematics and Statistics	15		
	D. Computer Science and Information System	9		
	E. Management Science	5		
2. Elective Courses	F. Elective Courses	36	36	28
3. General Courses	G. General Courses	16	16	13
	Total credit hours to graduate		127	100

11. Award Requirements

To graduate, students must achieve a total of not less than 127 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.

12. List of Courses According To Semester (Matriculation/STPM)

Semester 1

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEG1443 Principles of Geographic Information Science	A		3	14/16 **See Note[2]
2. SBEG1333 Survey and Mapping I	B		3	
3. SBEG1773 Mathematic for Geoinformatics	C		3	
4. SBEG1363 Computer Programming I	D		3	
5. ULRS1182 Appreciation of Ethics and Civilisations	G		2	
6. UHLM1012 Malay Language for Communication 2[1]	G		2	

Note: [1]Course UHLM1012 is compulsory for International students only
Note: [2]Total credit for students who enrolled the course UHLM1012 is 16.

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEG1373 Survey and Mapping II	B	SBEG 1333	3	13/15 **See Note[2]
2. SBEG1473 Principles of Photogrammetry & Remote Sensing	B		3	
3. SBEG1483 Computer Programming II	D	SBEG1363	3	
4. SBEG1112 Geographic Studies	A		2	
5. UHLB1112 English Communication Skills[1]	G		2	
6. ULRS1012 Value and Identity	G		2	

Note:[1]MUET Band 1, 2, and 3 should register for course UHLB1112 (HW).
Note:[2]Total credit for students who enrolled for course UHLB1112 is 15.

Semester 3

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEG2133 Statistics	C		3	16
2. SBEG2393 Applied Physics for Geoinformatics	C		3	
3. SBEG2463 Cartography	B	SBEG1333 SBEG1373	3	
4. SBEG2593 GPS Survey	B		3	
5. ULRS1022 Philosophy and Current Issues	G		2	
6. UHLB2122 Professional Communication Skills 1	G		2	

Semester 4

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEG2413 Introduction to Spatial Statistic	C	SBEG2133	3	13
2. SBEG2153 Geospatial Database	A		3	
3. SBEG2533 Digital Image Processing	A		3	
4. SBEG2492 GIS Training Camp I	A		2	
5. ULXXX KOQ	G		2	

Semester 5

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEG3542 GIS Training Camp II	A		2	18
2. SBEG3422 Cadastral Studies	B		2	
3. SBEG3513 Spatial Analysis	A	SBEG2413 SBEG1443	3	
4. SBEG3163 System Analysis and Design	D	SBEG1363 SBEG2153	3	
5. SBEG3343 Spatial Algorithms and Applications	C		3	
6. SBEG3643 Computer Programming III [1]	F	SBEG1363 SBEG1483	3	
7. SBEG3573 Digital Photogrammetry[1]	F		3	

8. ULRS3032 Entrepreneurship and Innovation	G		2	

Note: [1]Elective courses to be offered, choose 3 credits (1 course). The elective course will be advised by the Programme Coordinator.

Semester 6

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEG3602 Institutional & Legal Aspect	E		2	18
2. SBEG3583 GIS Software System[1]	F		3	
3. SBEG3603 Visualisation & System Customisation for Geoinformation[1]	F	SBEG1363 SBEG1483	3	
4. SBEG3553 GIS & Remote Sensing Application[1]	F		3	
5. SBEG3703 Spatio Temporal GIS[1]	F		3	
6. SBEG3453 Database Management System[1]	F		3	
7. SBEG3663 Non-Imaging Remote Sensing[1]	F		3	
8. UHLB3132 Professional Communication Skill II	G		2	
9. UHLX1112 Elective Foreign Language	G		2	

Note: [1]Elective courses to be offered, choose 12 credits (4 courses). The elective courses will be advised by the Programme Coordinator.

Short Semester

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEG3685 Industrial Training [1]	A		5	5

Note: [1] Practical & Seminar & reporting (HW) (10-12 weeks)

Semester 7

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEG4543 GIS Project Management	E		3	14/17 **See Note[3]
2. SBEG4602 Undergraduate Project I	A		2	
3. SBEG4643 Spatial Data Management[1]	F	SBEG1443 SBEG3583	3	
4. SBEG4633 GIS For Resource Management[1]	F		3	

5. SBEG4523 DTM For GIS[1]	F		3	
6. SBEG4513 LiDAR Survey[1]	F		3	
7. Free Elective[2]	F		3	

Note: [1]Elective courses to be offered, choose 9 credits (3 courses). Elective courses will be advised by the Programme Coordinator.
Note: [2]Elective courses to be offered by Co-Curriculum Service Learning Centre (Interfaculty course offered by Faculty). Choose Free Elective either in Semester 7 or Semester 8
Note: [3]If a student chooses to enrol in Free Elective this semester, the total credit will be 17

Semester 8

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEG4664 Undergraduate Project II	A	SBEG4602	4	13/16 **See Note[3]
2. SBEG4583 Web-based GIS[1]	F		3	
3. SBEG4563 Strategic Planning[1]	F		3	
4. SBEG4903 E Government[1]	F		3	
5. SBEG4913 GIS for Social Science[1]	F		3	
6. Free Elective[2]	F		3	

Note: [1]Elective courses to be offered, choose 9 credits (3 courses). Elective courses will be advised by the Programme Coordinator.
Note: [2]Elective courses to be offered by Co-Curriculum Service Learning Centre (Interfaculty course offered by Faculty). Choose Free Elective either in Semester 7 or Semester 8
Note: [3]If a student chooses to enrol in Free Elective this semester, thetotal credit will be 16

13. Syllabus Synopses

The following syllabus synopses address 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 programme coordinator before enrolling for any of these elective courses.

Core Courses

SBEG1443 – Principles of Geographic Information Science
This course is designed to provide an understanding of theory and principles of geospatial information science and technology (GI S&T) and introduces a basic skill in using the Geographic Information System (GIS) software. The course implements the 21st century learning strategy by adopting the teaching research nexus at an early introductory program (i.e. inquiry-based learning approach) in topics that require students to relate spatial and geographic issues with solutions that GIS can offer.

SBEG1333 - Survey and Mapping I
This course introduces students to the fundamentals of surveying and mapping with emphasis on principles and procedures in surveying and mapping techniques. It covers the following main topics: introduction to surveying, basic procedures in surveying, introduction to reference systems, distance measurement, orientation and angle measurement, height measurement and computation of areas and volumes. Some field works will be carried out in the faculty area under the supervision of a lecturer. This also allows for progress to be monitored continuously, and some of the generic skills assessment can be undertaken.

SBEG1773 - Mathematics for Geoinformatics
The course is designed to provide the mathematical knowledge needed for handling and managing geospatial information systems. Students are expected to have a general knowledge of high school mathematics. Mathematics is written in the language of logic, and set theory is the fundamental for all mathematical theorists. It appears that logic in geospatial programming languages is required as syntactic constructs to express propositions and predicates, and to infer conclusions from given or assumed facts. In addition, the use of computers and software for the handling and processing of spatial data requires new contents such as discrete mathematics and topology.

SBEG1363 - Computer Programming I
This course is an introduction to the program development life cycle, logic diagrams, debugging procedures, top-down design, top-down programming and structured programming. Extensive computer laboratory exercises and written homeworks are assigned. Computer program solutions are implemented using open source programming language and IDE.

SBEG1373 - Survey and Mapping II
This basic knowledge of surveying is one of the core subject for the B. Sc. Geoinformatics program. It exposes students to the basics of various topics under survey engineering including electronic distance measurement, height determination, traversing, topographical surveying, route surveying, road design, and mapping software. It also covers the basics of various fields of surveying such as hydrographic surveying, GIS and remote sensing. For topics related to field work (data acquisition, processing and presentation) a brief instruction on the field work will be given at the beginning of each topic. Students (in groups) are expected to submit and present each report two weeks after the given predetermined length of time of the field work has expired. The field works will be carried out in the designated area, with close supervision by the lecturer. This will also allow for progress to be monitored continuously, and some of the generic skills assessment can be undertaken.

SBEG1473 - Principles of Photogrammetry & Remote Sensing
This course introduces the basic principles of photogrammetry and remote sensing to students, emphasizing on all the basic aspects of the remote sensing process, interaction of electromagnetic radiation with objects of interest on the earth surface and in the atmosphere, and platforms for acquisition of remotely sensed data. Students will learn about processing satellite remotely sensed data with different spectral, spatial and temporal resolutions in the laboratory work. At the end of the course, students will have knowledge on the basic principles of remote sensing and digital image processing, which is useful in the field of GIS, and remote sensing for deriving geospatial information from the remotely sensed data, serving as key input to the database updating for map production.

SBEG1483 - Computer Programming II
This course presents the principles and methodology for object-oriented programming. This course is a continuation from the Computer Programming I course (a pre-requisite course for Computer Programming II). In particular, this course emphasizes on the design principles and practice, understanding and use of UML for OO design and practice. The course features extensive individual and group laboratory exercises of OO programming.

SBEG1112 - Geographic Studies
The purpose of this course is to promote an understanding and appreciation of geographical knowledge related to GIS and remote sensing applications. The course covers topics on Introduction to geography (physical and human geography), Weather and climate including water cycle and atmospheric circulation, Terrestrial Ecosystem and its change due to human interruption. Human Geography covers topics on Urban geography: Urban and rural land use, natural resources management and impact of human activities on the urban environment. At the end of the course students should be able to relate geographical phenomena to how GIS and remote sensing as geographical tools can be used to help solve geographic-related problems.

SBEG2133 - Statistics
This course is intended as an introduction to spatial statistics and aims to provide students with the background necessary to investigate geographically represented data. There are numerous research questions involving spatial data, but in this course, focus is placed on methods that are relevant in the fields of public health, environmental science,

and social science. The course covers descriptive statistics, probability distribution, statistical inference, comparative study, correlation and autocorrelation, spatial autocorrelation, simple and multiple regression.

SBEG2393 - Applied Physics for Geoinformatics
This course is designed to provide understanding, knowledge, and exposure on the applied physics principles utilized in geoinformation science and its related technologies. The scope of the course consists of several modules including; Electromagnetic wave and matter interactions; Radiative transfer equation for environmental scanning and Blackbody radiation and its application. Emphasis is given on the application of related physics in retrieving and recording the environmental & earth geographic information. Students will be exposed to the fundamentals of applied physics principles and their practical uses in respective geoinformatics applications.

SBEG2463 – Cartography
This course focuses on the principles of mapping (cartography) it includes the following : Understanding the reality, geography and environment, Translation and abstraction of reality to abstract in the form of maps, Understanding issues and problems relating to mapping and spatial data transformation reference and coordinate systems, the elements of maps and map usage; Understanding the principles and procedures of cartographic design on topographic and thematic maps with the principles of graphic communication, The concept of mapping globally, regionally and locally (Malaysia); Understanding the characteristics of output for effective information dissemination, Understanding the processes, activities and visualization effects through the medium of graphic communication, and The relationship between cartography and geographic information system (GIS) output.

SBEG2593 - GPS Survey
This course focuses on understanding the theory and principles of Global Positioning System (GPS). The topics covered include: Overview on Geodesy and GNSS; GPS Application, Mission and Planning; GPS Post- Processing (Static and Fast Static) and Differential Mode; Real-time Kinematic (RTK) and Virtual Reference Station; GPS/GIS Data Capture and Collection; Field and Office Procedures; Field Practice using RTK and Differential Techniques. This course also covers the design and planning of static networks and preparing for a GPS field survey.

SBEG2413 - Introduction to Spatial Statistics
This course introduces the fundamentals of statistical analysis of spatial data to students. Initially it links conventional statistics with spatial data, where later on this evolves into spatial statistics. The first half of this course introduces the application of conventional statistics in spatial aspects such as central tendency, hypothesis testing and correlation. The second half focusses on the real spatial statistics topics, for instance point, line and polygon pattern analysers.

SBEG2153 - Geospatial Database
This course presents an introduction to database systems, database approach, database environment, database language data models, relational model, relational algebra, structure query language objectives and commands, data manipulation, database planning, analysis and design techniques, entity relationship modelling, types, relationships and attributes. This course also presents the design and development of a Geospatial database (spatial and non-spatial)

and the development of Geospatial applications to support spatial decision making. Particular emphasis is placed on the use of data modelling techniques to design a Geospatial database. Students will work in small groups to develop a conceptual design for a Geospatial database and will then work individually to build a Geospatial database using available digital data as well as data digitized from existing maps.

SBEG2533 - Digital Image Processing
This course is an introduction to digital image processing. It includes concepts of digital image sampling & image digitization, image storage, image file management & display system, Digital data of remote sensing, media format and header information sources; Image pre-processing: geometry correction, noise removal, radiometry correction, Image enhancement: linear and non-linear operations and image transformation, Image classification: supervised and unsupervised classifications; Output production and information processing; and Applications of Remote Sensing digital image processing to various applications.

SBEG2492 - GIS Training Camp I
GIS Training Camp 1 recollects and revises the geospatial data collection methods from previous data collection courses. The course is directed at giving students an understanding of, and experience with the theories and technical skills related to geospatial data collection methods, and to develop a geospatial database. Field work, laboratory exercises and projects will use real-world datasets. Students are expected to gain an understanding of geospatial data collections and geospatial database development theory and methodology. Students are also expected to demonstrate abilities of spatial thinking. An independent project constitutes a substantial portion of the final assessment.

SBEG3422 - Cadastral Studies
The course is designed to describe the fundamentals of cadastre and the needs of cadastre in the development of spatial data infrastructure. The course emphasizes on the development of cadastre systems and the new requirement for sustainable land records. This course provides an understanding of the current cadastre development in Malaysia and worldwide.

SBEG3513 - Spatial Analysis
This course presents the principles and methodology for spatial data analysis. In particular, it emphasises on the analyses that are commonly found in GIS, which include data exploration, vector and raster data analysis, terrain mapping & analysis, viewsheds and watersheds analysis, spatial interpolation, geocoding and dynamic segmentation, least-cost path analysis and network analysis, and GIS models & modelling. The course features extensive use of geospatial analysis software tools through individual as well as group project works.

SBEG3163 - System Analysis and Design
Systems Analysis and Design (SAAD) is a broad term for describing methodologies for developing a high quality Information System, which combines Information Technology (IT), people, data and process to support business requirements. The area of SAAD has the contribution of different developmental teams which includes the system analysts who analyse how users interact with technology and business functions by examining the inputting and

processing of data, and the outputting of information for improving organizational processes. Many improvements involve better support of users' work tasks and business functions through the use of computerized information systems. So, the system analyst must play the role as a consultant, a supportive expert and an agent for change.

SBEG3343 – Spatial Algorithms and Applications
The aim of this course is to provide the fundamental theory of mathematics and computer science in GIS implementations. This knowledge is necessary in order to evaluate the results in GIS analysis and to carry out advanced analyses where tools are not available in a standard GIS program. The course gives the basic theory to manipulate geographic data and acquaint students with important algorithms in GIS. The course culminates with group presentations.

SBEG3602 - Institutional & Legal Aspect
This course introduces students to Institutional and Legal aspects that may arise when geospatial information is used in various geo-related applications and data management. The course covers the legal and policy issues that are related to geoinformation, sharing of geodata and framework for data sharing (metadata, standards etc.), Spatial Data Infrastructure, Intellectual Property Rights, Information and Data Privacy, and Liability.

SBEG3542 - GIS Training Camp II
The purpose of this course is to provide students with the opportunity to integrate technical knowledge and generic skills attained in the earlier years. Students are given exposure on software handling, especially tools in database development, customization and application development. Students will apply their knowledge and skills to solve real problems in the project given in the course. A small team (typically five or six students) is formed under the supervision of an academic staff and has to survey the needs of potential end users, conceive the potential solutions, performing a feasibility study for the proposed solution from the various aspects such as social, technological, economic and environmental impacts. At the end of the training, students are expected to be able to handle high-end GIS software and other related packages. They are also expected to be able to recognize tools required in the database and application developments and also appreciate the basic skills in writing GIS applications. The C-D-I-O (Conceive – Design – Implement – Operate) framework through a Capstone project is implemented throughout the course.

SBEG3685 - Industrial Training
Students will undergo industrial training with a duration of 10 weeks. During that time the students will be attached to the government or private agencies that are related to geoinformation jobs and works.

SBEG4543 - GIS Project Management
The purpose of this course is to expose students to the factors involved in managing GIS projects. By completing this course, students should be able to apply their knowledge and skills on project management when they are working in real situations.

SBEG4602 - Undergraduate Project I
The main aim of this course is to provide students with understanding on research and research methods in various fields of geoinformatics. With this understanding, students should be able to acquire skills in performing literature review, design and plan their research projects, and write as well as present proposal reports. Students will also be exposed to the practices of managing research projects.

SBEG4664 - Undergraduate Project II
The main aim of this course is to provide students with understanding on research and research methods in various fields of geoinformatics. With this understanding, students should be able to acquire skills in performing literature review, design and plan their research projects, and write as well as present proposal reports. Students will also be exposed to the practices of managing research projects.

Elective Courses

SBEG3583 - GIS Software System
This course is designed to provide more detailed knowledge about GIS software especially those that are commonly used by the GIS community. It introduces the concept and architecture of GIS software systems. The course covers from the intermediate knowledge to advanced usage of the GIS software for the purpose of GIS analysis and application. Several commercial and non-commercial GIS software and software vendors are introduced. This course also offers knowledge for developing small scale GIS software/application while handling some related GIS projects. Students are also exposed to more hands-on exercises, handling and managing spatial GIS data using various GIS software. Hence, students are expected to gain:

a) An understanding of the technologies, architecture and development of the GIS software;
b) Ways of processing the spatial data by utilizing the GIS software and
c) Its abilities to demonstrate spatial thinking to solve spatial problems by utilizing the GIS software system and application development.

SBEG3573 - Digital Photogrammetry
The course is designed to give students a thorough understanding of conventional photogrammetry, digital photogrammetry (airborne and close-range), commercially available systems, methods of data acquisition, products, limitations and related applications.

SBEG3643 - Computer Programming III
The aim of the study is to provide basic knowledge in Internet programming and to highlight the importance of the subject of web-based GIS development. Students will be exposed to basic knowledge in web design fundamentals such as; what are the web approaches, web purpose, audience, web layout and design. Furthermore, students will get an overview on programming languages such as HTML, CSS, JSON and XML for web developments. During the course, attention will be given to the students' understanding, and their ability in designing and developing web applications.

SBEG3603 - Visualization & System Customization for Geoinformation
This course introduces advanced concepts of object-oriented programming and component-based software development to students. The basic infrastructure as well as different approaches on the application levels are discussed. It's also shown how modern visualization techniques are embedded in the overall workflows. The aim of study is to provide basic knowledge and to highlight the importance of the subject for geoinformation application customization and development. Basic programming and database skills are a prerequisite for this course. Students will be exposed to several programming languages such as Python, PHP and SQL manipulation.

SBEG3553 - GIS & Remote Sensing Application
GIS and Remote Sensing Applications introduces the applied use of geospatial data in the studies of natural disasters, geohazards, urban planning, marine and terrain analysis etc. The course is directed at giving students an understanding of and experience with the practical use of geospatial data and related software. Laboratory exercises, case studies, and projects will use real-world datasets. It emphasizes the applications of geospatial information in solving real-world problems. Students are expected to gain an understanding of GIS and remote sensing theory, methodology and most importantly applications. Students are also expected to demonstrate abilities of spatial thinking and spatial analysis, and be able to solve practical spatial problems utilizing a GIS and remote sensing. An independent project constitutes a substantial portion of the final assessment.

SBEG3703 - Spatio Temporal GIS
This elective course is designed to provide a bigger framework for spatio temporal GIS in order to enhance the students' knowledge in the context of Geographic information. This course is divided into three main topics, namely data modelling for spatio temporal GIS, the analytics of spatio temporal GIS and visualization of spatio temporal GIS. Students are also expected to explore several spatio temporal applications and identify issues in regards to design, development and implementation of spatio temporal GIS. By the end of this course, students should be able to demonstrate and show a greater improvement in spatial thinking skills for solving spatio temporal GIS problems. Students will be given an independent project, test and exam that constitutes the overall assessment of this course.

SBEG3453 - Database Management System
This course exposes students to the fundamental concepts, techniques in the development of databases as well provides a foundation for research in databases. The course will expand upon what students learn in Geospatial Database and introduces various other advanced topics including SQL, object-oriented database, query optimization, concurrency, data warehouses, object-oriented extensions, XML, Web database programming, Conceptual data modelling, E/R data model, Normal Forms (NF), 1-4NF, XML, XPath and XQuery. The course requires individual and group projects, in which students implement database applications or explore database issues.

SBEG3663 - Non-Imaging Remote Sensing
Non-imaging remote sensing introduces the active microwave sensor technologies that produce non-imaging data. Non-imaging sensors measure the radiation received from all points in the sensed target, integrate them, and report the result as an electrical signal strength. The course is directed at giving students an understanding of and experience

with the practical use of non-imaging remote sensing data and related software. Laboratory exercises, case studies and projects will use real-world datasets. It emphasizes the applications of non-imaging remote sensing data in solving real-world problems. Students are expected to gain an understanding of non-imaging remote sensing theory, and most importantly applications. Students are also expected to demonstrate abilities of spatial thinking and digital data processing, and be able to solve practical spatial problems utilizing a remote sensing methodology. An independent project constitutes a substantial portion of the final assessment.

SBEG4643 - Spatial Data Management

This course is designed to provide students with an understanding of geospatial data and how, in practice, it is handled and managed. Among the topics covered throughout the course are:

a) General problems with geospatial data handling and related issues
b) Concepts and development of Spatial Data Infrastructure (SDI); Malaysian Centre For Geospatial Data Infrastructure (MaCGDI) as Malaysian National SDI
c) Geospatial data standard, sharing/exchange & distribution (MS1759, feature and attribute coding, metadata, data catalogue, data security); MyGeoportal
d) Geospatial data storage and transfer (sources, format, coordinate systems; conversion, compression)
e) Raw vs Derived/Manipulated Data
f) Data Quality/Integrity (dealing with errors and topology)
g) Height/surface data handling (JUPEM's topographic data, GPS data, LiDAR data, geological data, interpolation, extrapolation, TIN, DEM)
h) Subsurface Data (geological; underground utility)

SBEG4633 - GIS for Resource Management

This course provides the students with the principles of resource management and conservation, besides examining contemporary problems and issues in resource and environment management. The principles and components of GIS are introduced to encourage the use of a database approach to store resource data that is to be converted into information useful for decision making and problem solving. Different aspects of the application of GIS and GIS analysis are highlighted as a means towards the efficient management of resources

SBEG4523 - DTM for GIS
This course is designed to provide students with an understanding of DTM (Digital Terrain Modelling) for GIS. Among the topics covered throughout the course are:
a) Definitions of DTM
b) DTM data collection techniques
c) DTM data pre-processing
d) DTM data processing
e) DTM applications
f) New emerging technologies on DTM techniques
g) 3D city modelling

SBEG4813 - LIDAR Survey
The course is designed to provide a thorough understanding of the principles of LiDAR technology (spaceborne, airborne, terrestrial and mobile LiDAR systems), commercially available systems, methods of data acquisition, data processing, limitations and related applications, e.g. in forestry, topographical mapping, hydrology, urban planning, hazard management, etc.

SBEG4583 - Web-Based GIS
The aim of the study is to provide basic knowledge and highlight the importance of the course for Web GIS development. During the course, attention will be given to the students in understanding of the process for web GIS development, the functional requirements, system architecture and their ability in developing Web-based (GIS) programs. Students are required to develop a web GIS application using map servers such as Map Guide Maestro and free mapping APIs.

SBEG4563 - Strategic Planning
This course is designed to provide students with an emphasis on the understanding of the definition, importance component, development, relationship of strategic planning and GIS.

SBEG4903 - E-Government
The purpose of this course is to expose the students to the necessary elements of the real benefits of GIS as applied for local authorities. Students are introduced to the history of geographic information management and explained regarding what the local authority's needs are and what they need to do in order to be more successful with the help of GIS. At the end of the course, students should be able to explain the basic elements of GIS implementation in the local authority, the organizational aspects, the importance of the organization to the success of GIS, the main users of GIS and their needs, the constraints, etc.

SBEG4913 - GIS for Social Science
This course introduces the application of GIS for social science to students. It covers topics of qualitative and mixed-mode GIS, alongside the technical aspects of social science GIS. Students will also be exposed to case studies of election and tourism management in regard to GIS.

14. Elective Courses

Course Code	Course Name (Year 3)	Credit
1. SBEG3643	Computer Programming III	3
2. SBEG3573	Digital Photogrammetry	3
3. SBEG3583	GIS Software System	3
4. SBEG3603	Visualisation & System Customisation for Geoinformation	3
5. SBEG3553	GIS & Remote Sensing Application	3
6. SBEG3703	Spatio Temporal GIS	3
7. SBEG3453	Database Management System	3
8. SBEG3663	Non-Imaging Remote Sensing	3

Course Code	Course Name (Year 4)	Credit
1. SBEG4643	Spatial Data Management	3
2. SBEG4633	GIS For Resource Management	3
3. SBEG4523	DTM For GIS	3
4. SBEG4513	LiDAR Survey	3
5. SBEG4583	Web-based GIS	3
6. SBEG4563	Strategic Planning	3
7. SBEG4903	E Government	3
8. SBEG4913	GIS for Social Science	3
9. XXXX	Free Elective	3

11. Bachelor of Geomatics Engineering with Honours

1. Introduction

Geomatics Engineering is an academic discipline that concerns on acquisition, analysis, and interpretation of mainly geospatial data, relating to the Earth, its physical features and the built environment. It comprises tools and techniques of measuring, managing, presenting and analysing geospatial data from diverse sources with well-defined characteristics on accuracy and continuity; and in the form of digital format. Geospatial data are obtained from a wide range of technologically advanced tools like total station, Global Positioning System (GPS) / Global Navigation Satellite System (GNSS) equipment, digital aerial imagery (form both satellite and airborne), Terrestrial Laser Scanner (TLS), Unmanned Aerial Vehicle (UAV), echo sounder and Ground Penetrating Radar (GPR). These data are processed and manipulated by using a computer and the latest software. Also included in the area of geospatial are computer-based Geographic Information Systems (GIS) and remote sensing for monitoring the environment.

Bachelor of Geomatics Engineering with Honours is one of the oldest programme in UTM. It was first introduced in the early 1970s. Prior to 1994, the programme was known as Bachelor of Surveying (Land). This bachelor programme strives to deliver a quality educational experience via emerging geomatics technologies towards providing a significant contribution to the needs of the surveying and Geomatics Engineering profession nationwide.

2. Name of Award

Bachelor of Geomatics Engineering with Honours [B.Geomatics Eng (Hons)]

3. Programme Recognition

Bachelor of Geomatics Engineering with Honours is a professionally accredited degree by the Licensed Land Surveyors Board of Malaysia. The programme is also recognised by the Public Services Department of Malaysia and Malaysian Qualifications Agency (MQA).

4. Aim

The programme's goal is to produce graduates that are knowledgeable, expert and skilful in the field of land surveying and Geomatics Engineering as well as capable of managing, administrating and updating geospatial data professionally.

5. Programme Educational Objectives

The undergraduate programme in Bachelor of Geomatics Engineering with Honours is designed to produce graduates who will be:

PEO1 Competent and innovative in acquiring and applying knowledge towards solving Geomatics Engineering problems.

PEO2 Grow professionally with proficient soft skills to pursue career opportunities locally and globally.

PEO3 Demonstrate high ethical values as well as sense of responsibility towards organization and community.

6. Programme Learning Outcomes

The intended learning outcomes of the Bachelor of Geomatics Engineering with Honours programme are:

PLO1 Ability to acquire knowledge of science and technology in the field of Geomatics Engineering.

PLO2 Ability to analyse information using appropriate Geomatics Engineering techniques and tools.

PLO3 Ability to execute Geomatics Engineering tasks using available resources.

PLO4 Ability to adapt to changing situations and expectations within the team towards geomatics-based industrial and community needs.

PLO5 Ability to convey ideas and negotiate convincingly in Geomatics Engineering project.

PLO6 Ability to utilize information in Geomatics Engineering using appropriate software.

PLO7 Ability to analyse numerical and graphical information in Geomatics Engineering field.

PLO8 Ability to coordinate leadership qualities in the Geomatics Engineering field.

PLO9 Ability to perpetually acquire contemporary knowledge in the field of Geomatics Engineering.

PLO10 Ability to identify business opportunities and embark on entrepreneurship in Geomatics Engineering field.

PLO11 Ability to practice good ethics and positive values in the profession and society of Geomatics Engineering field.

7. Career Prospects

Spectrum of professional career prospects in Bachelor of Geomatics Engineering with Honours are as follows:

1. Licensed Land Surveyor
2. Government Land Surveyor
3. Geodesist
4. Hydrographer (offshore & onshore positioning specialises in marine hydrographic survey and oceanography)
5. Astronomer & Islamic Astronomer (Falak Syarie)
6. Photogrammetrist
7. Researcher
8. Academician
9. Geospatialist (government public sector & private firm)
10. Geomatics Engineer (*e.g.,* oil, gas & mineral exploration, construction, energy & utilities, land-use planning, three dimensional (3D) imaging, and positioning technology).

List of government agencies and local authorities that continuously require this profession are:

1. Jabatan Ukur dan Pemetaan Malaysia (JUPEM)
2. Land and Survey Department, Sarawak
3. Jabatan Tanah dan Ukur Sabah
4. Agensi Angkasa Malaysia (MYSA)
5. Pusat Hidrografi Nasional Malaysia
7. Jabatan Laut Malaysia
8. Jabatan Perhutanan
9. Higher education institution (Universities and Polytechnic)
10. Jabatan Kemajuan Islam Malaysia (JAKIM).

List of private sectors (local & international) that continuously require this profession are:

1. PETRONAS Carigali Sdn Bhd
2. Tenaga Nasional Berhad (TNB)
3. Telekom Malaysia
4. Licensed land surveying firm in Malaysia
5. Construction, plantation or logistics firms (*e.g.,* Sime Darby Berhad, YTL Corporation Berhad)
6. Land surveying equipment & system supplier
7. Related offshore and onshore oil & gas operating companies (*e.g.*,FUGRO, SHELL, Sapura Energy)
8. Private geomatics university college.

8. Mode and Duration of Study

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

9. 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. Survey Camp	3	77	60
	B. Core Courses	69		
	C. Industrial Training	5		
2. Elective Courses	D. Elective Courses	36	36	28
3. General Courses	E. General Courses	16	16	12
	Total credit hours to graduate		129	100

10. Award Requirements

To graduate, students must achieve a total of not less than 129 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.

11. List of Courses According To Semester (Matriculation/STPM)

Semester 1

Course	Course Group	Prerequisite	Credit	Total Credit
1. SSCE1023 Mathematics for Surveyors I	B		3	13*
2. SBEU1032 Physics Theory for Surveyors	B		2	
3. SBEU1013 Fundamental of Survey & Mapping	B		3	
4. SBEU1093 Computer Programming	B		3	
1. ULRS1182 Appreciation of Ethics and Civilisations (Local & International)	E		2	

2. UHLM1012 Malay Language for Communications (for International Student only)	E		2	

Note: *Total sum of credit hours for local students. The total sum of credit hours for international students will consider an additional 2 credit hours for UHLM1012

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. SSCE1053 Mathematic for Surveyors II - Advance Calculus	B		3	13*
2. SBEU1132 Applied Physics for Surveyors	B	SBEU1032	2	
3. SBEU1503 Cartography	B		3	
4. SBEU1043 Engineering Surveying	B		3	
5. UHLB1112 English Communication Skills[1&2]	E		HL	
6. ULRS1012 Value and Identity	E		2	

Note:[1]MUET Band 3.5 and below should register for course UHLB1112 (HL).
Note:[2]Total credit for students who enrolled for course UHLB1112 is 15.

Semester 3

Course	Course Group	Prerequisite	Credit	Total Credit
1. SSCE2443 Statistic for Surveyors	B		3	16
2. SBEU2113 Mathematic for Surveyors III -Survey Computation	B		3	
3. SBEU2043 Engineering Surveying Technology	B	SBEU1043	3	
4. SBEU2602 Geodesy I	B		2	
5. SBEU2141 Survey Camp I (HW)	A		1	
6. UHLB2122 Professional Communication Skills I	E		2	
7. ULRS1022 Philosophy and Current Issues	E		2	

Semester 4

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEU2412 Introduction to Adjustment Computation	B		2	15
2. SBEU2252 Satellite Positioning I	B		2	
3. SBEU2452 Photogrammetry I	B		2	
4. SBEU2513 Hydrographic Surveying	B		3	
5. SBEU2613 Geodesy II	B		3	
6. SBEU2151 Survey Camp II	A		1	
7. ULRF2XX2 Service Learning Co-curriculum	E		2	

Semester 5

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEU3XX3 Elective 1	D		3	18
2. SBEU3XX3 Elective 2[1]	D		3	
3. SBEU3XX3 Elective 3[1]	D		3	
4. SBEU3213 Field Astronomy	B		3	
5. SBEU3313 Cadastral Survey	B		3	
6. SBEU3161 Survey Camp III	A		1	
7. ULRS3032 Entrepreneurship and Innovation	E		2	

Note: [1]Elective courses to be offered, choose 9 credits. Elective courses will be advised by Programme Coordinator.

Semester 6

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEU3XX3 Elective 4[1]	D		3	17
2. SBEU3XX3 Elective 5[1]	D		3	
3. SBEU3XX3 Elective 6[1]	D		3	
4. SBEU3XX3 Elective 7[1]	D		3	
5. SBEU3553 Geographical Information System	B		3	
6. SBEU3922 Technical Writing	B		2	

Note: [1]Elective courses to be offered, choose 12 credits. Elective courses will be advised by Programme Coordinator.

Short Semester

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEU3905 Industrial Training - Practical & Seminar	C		5	5

Semester 7

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEU4XX3 Elective 8[1]	D		3	16
2. SBEU4XX3 Elective 9[1]	D		3	
3. SBEU4313 Land Law and Survey Regulation	B		3	
4. SBEU4942 Undergraduate Project I	B		2	
5. UHLB3132 Professional Communication Skills II	E	UHLB2122	2	
6. ******** Free Elective	D		3	

Note: [1]Elective courses to be offered, choose 6 credits. Elective courses will be advised by Programme Coordinator.

Semester 8

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEU4XX3 Elective 10[1]	D		3	16
2. SBEU4XX3 Elective 11[1]	D		3	
3. SBEU4372 Project Management for Surveyors	B		2	
4. SBEU4342 Professional Practice	B		2	
5. SBEU4944 Undergraduate Project II	B		4	
6. UHLX1XX2 Elective Foreign Language	E		2	

Note: [1]Elective courses to be offered, choose 6 credits. Elective courses will be advised by Programme Coordinator.

12. Elective Courses

No	Course Code	Course Name	Credit
1.	SBEU3253	Satellite Positioning II	3
2.	SBEU3283	Least Squares Adjustment	3
3.	SBEU3453	Photogrammetry II	3
4.	SBEU3403	Remote Sensing	3
5.	SBEU3523	Hydrographic Surveying Technology	3
6.	SBEU3893	Map Projection	3
7.	SBEU3323	Cadastre Survey Practice	3
8.	SBEU4743	Marine Geodesy	3
9.	SBEU4273	Underground Utility Mapping	3
10.	SBEU4803	Deformation Survey	3
11.	SBEU4823	Tidal Processing & Analysis	3
12.	SBEU4833	Terrestrial Laser Scanning	3
13.	SBEU4723	Falak Syarie	3

14.	SBEU4873	Law of the Sea	3
15.	SBEU4853	Geospatial Management & Implementation	3
16.	SBEU4863	Industrial Survey	3
17.	SBEU4913	Marine Cadastre	3
18.	SBEU4923	Geospatial Data Analysis	3
19.	SBEU4933	Airborne Survey	3

13. Syllabus Synopses

The following syllabus synopses address 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 programme coordinator before enrolling for any of these elective courses.

Core Courses

SBEU1013 - Fundamental of Survey and Mapping
This course introduces students to fundamental aspects of surveying and mapping. The basic surveying and mapping techniques as well as equipment are introduced and students will get the opportunity to use this equipment.

SBEU1093 - Computer Programming
This course is designed to provide knowledge in computer programming, which is essential for geomatics engineers. This course helps to solve many geomatics related problems such as surveying computation, graphical analysis and multimedia elements that are sometimes not offered by geomatics commercial software. The teaching concentrates on the concept, skills and techniques of problem solving using an appropriate programming language. A commercial programming language is used in this course. The programming exercises are designed to solve problems in geomatics engineering.

SBEU1032 – Physics Theory for Surveyors
This course is designed to provide students with the understanding, knowledge and exposure to the theory and concept of physics related to geomatics engineering and its associated technologies. The course covers topics of Electromagnetics of wave and sounds with its physical interaction, Wave Propagation, Gravity, Thermal and heat transfer, Orbital mechanics and Optics. Strong emphasis is given in relation to state-of-the-art geomatics measurements in retrieving and recording the environmental and geographical information. Students will be exposed to the fundamentals of physics through lectures, short computational experiments and scientific discussion in each topic.

SSCE1023 - Mathematics for Surveyors I
This course introduces students to basic math concepts and principles useful for survey computation and the overview or guide to computation processes unique to surveying and mapping. It provides students with a solid foundation in the fundamental theoretical aspects of the operations of arithmetic, algebra, geometry, and trigonometry, along with a broad range of techniques for applying the theory in survey computation, emphasizing their inter-relationships and applications to surveying and mapping.

SSCE1053 – Mathematics for Surveyors II
This course is designed to develop topics of differential and integral calculus, emphasizing on real numbers, functions, continuity and limits and derivatives. It provides students with the important ideas of calculus but emphasizing its application to surveying and mapping. This course includes the study of functions; limits and continuity; derivatives for functions of one-variable including algebraic, logarithmic, and exponential functions; interpretations of the derivative and its application in survey computation.

SBEU1503 - Cartography
This course focuses on topics such as introduction to cartography: Definition, concept, role of maps to people; Data and information: data sources, data capture, criteria, measurement, data gathering, data selection and processing: Principle, procedure and data transformation techniques for information; Generalisation: principle, data manipulation and processing using manual and computerized technique; Types of map, map element, topographical & thematic maps, charts, plans, large and small-scale maps; Cartographic communication: Introduction to cartographic communication model; Map design: procedures and layout, symbolization and their uses; Map production: principle, process, equipment and planning, photography, duplicating and printing; and Introduction to computer cartography: system and software.

SBEU1043 - Engineering Survey
This course is designed to introduce the theory and principles of different types of engineering surveys by the use of selected surveying projects and problems to enable a basic understanding of each topic to be gained. This course also provides both theory and application of computer assisted drafting/mapping, to develop skills through intensive practical work. Students will possess land survey drawing skills in computer assisted drafting.

SBEU1132 - Applied Physics for Surveyors
This course provides a cohesive understanding on the application of the concepts and related theories of physics in geomatics engineering. Students will be given modules that present the application of electromagnetics wave, microwave and radio frequency signals, Optical spectrum, Sounds wave, and Antenna and other reception instrumentation in geomatics measurement. This course is anticipated to expose the state-of-the-art geomatics technologies and measurements relevant to the latest physics application. Lectures, computational exercise and scientific discussion through class debates and presentations are carried but in each module according to the course schedule. Students are strongly encouraged to complete the course of SGHU1032 (Physics theory) as a prerequisite to enrol in this course.

SSCE2443 - Statistic for Surveyors
This course is designed for mathematical statistics, emphasizing on summary statistics and statistical inference, histograms and sample statistics, probability, sampling distributions, tests of significance, correlation and regression. It provides students with the important ideas of mathematical statistics but emphasizing its application to surveying and mapping for supporting the need of the Geomatics engineer in geospatial data analysis. The focus is on practical Geomatics problems such as selecting the appropriate analysis, data preparation and input & output interpretation. The course features extensive use of computer software and writing to solve statistical problems related to Geomatics needs.

SBEU2113 - Mathematics for Surveyors III
This course provides some aspects of surveying computation related to various surveying problems. It examines various ways of solving problems, starting from the basic formulae to more advanced algorithms in achieving the results. The learning process is based on two modules; lectures and tutorials. This course encourages group working and students are allowed to discuss with each other to solve the given problems.

SBEU2043 - Engineering Survey Technology
This course provides basic theory of advanced electronic instrumentation in engineering surveys. It comprises of several aspects such as physical laws and frequency spectrum of electromagnetic waves; basic principle of electronic measurement using total station and Electronic Distance Measurement (EDM); Electro Optical and Microwave Distance (EOMD) measurements; propagation of electromagnetic waves in air; corrections of TS/EDM distances, errors in TS/EDM, and baseline configuration and calibration. In practical sessions, the student is exposed to automation data collection, processing, analysis and drawing using geomatics engineering software such as CDS and AutoCAD. In addition, the course also addresses present-day technology on Underground Utility Mapping, Digital Terrain Model (DTM) and road design.

SBEU2602 - Geodesy I
This course deals with the basic concept and knowledge of geodesy. This includes history on the determination of size and shape of the earth, fundamentals and principles of the geoid, sphere, ellipsoidal geometry, curves of the ellipsoid's surface, computation of geodetic coordinates, direct and inverse geodetic problems, geodetic datum (local and global datum) and deflections of the vertical. It also includes the coordinate systems, datum transformation and height system used in Malaysia. Lastly, it provides exposure on geodetic infrastructure and its current practice in Malaysia in order to improve student knowledge and skills on geodesy for positioning, mapping and other geomatics related applications.

SBEU2141 – Survey Camp I
This course provides students with the experience to carry out geomatics related projects such as planimetric and vertical control establishments. This involves field work practical (e.g., project planning and data acquisition via a combination of terrestrial and space observation technologies), laboratory work (e.g., data management and processing), report writing and presentation. Extensive laboratory work training on Digital Elevation Model (DTM), areas, contouring, and volume of earthwork are also provided throughout this course.

SBEU2412 - Introduction to Adjustment Computation
This course provides the principle and methodology for least square estimation (LSE) or/and least square adjustment (LSA). It emphasises on several key elements of LSE that comprises error in measurement, random variables, weight of observation, and observation on linear equations. The course features use of MATLAB software as a computational tool that is conducted via group and individual project works.

SBEU2252 - Satellite Positioning I
This course takes a basic look at student knowledge and skills related to satellite-based technology for positioning, mapping and other geomatics related applications. The contents consider basic theory, methods and data processing techniques for satellite-based positioning on GPS/GNSS.

SBEU2452 - Photogrammetry I
This course provides an understanding of the principles and theory in producing topographic map, plan, digital terrain model (DTM), orthophoto and rectified photo by using aerial photographs. It emphasises on the procedure for producing the map by applying analogue and analytical methods. Extensive laboratory works on the use of photogrammetric instruments and photogrammetry's software are included.

SBEU2513 - Hydrographic Survey
This course provides the concepts and principles of hydrography survey that comprises nautical and hydrographic charts production; ocean tides; seabed's depth and position determination. Students will be exposed to hydrography surveys planning, processing and plotting.

SBEU2613 - Geodesy II
This course provides advanced theory on geodesy that comprises methods and geodetic data processing as being practised in Malaysia. Establishment of horizontal and vertical control using GNSS and precise levelling will be conducted by the student. Details about map projection and coordinate systems in Malaysia will extensively be discussed.

SBEU2151 – Survey Camp II
This course is intended to provide students with experience to carry out field practical hydrographic surveying, photogrammetry survey and GPS survey that comprises data acquisition, processing and presentation. The field practical exposes students to project planning, flight planning, establishment of ground controls and tide gauge station, DGPS technique of positioning, depth measurement using MBES, data processing and chart production. Students will also be exposed to the use of current meter, side scan sonar (SSS) and unmanned aerial vehicle (UAV) during this field practical.

SBEU3213 - Field Astronomy
This course introduces the basic concepts of astronomy and its application in surveying. It exposes students to the concept of the universe, such as the galaxy and solar system that are related to procedures of field astronomy for the determination of astronomical geodetic control (i.e., azimuth, latitude and longitude) for cadastral surveying, geodesy and falak syarie (Islamic astronomy).

SBEU3313 – Cadastral Survey
This course provides information on the 2009 Cadastral Survey Regulations. It covers several topics such as, Role of the Survey Department, Land Office and Land Surveyors Board for Peninsular Malaysia; Coordinate systems and azimuth observations; Use and calibration of equipment; Cadastral classification; Survey datum; Measurement and booking for bearing and distance; Traverse survey and techniques to extend the line; Short lines measurement and Border demarcation; Types of boundary marks; Calculation for the reservation; Traverse bearing adjustment (c and m); Reparation of final calculation sheet; Certified plan drawing and updating for standard sheet or cadastral map; Refixation; and Working procedures at the Survey Department and CALS System.

SBEU3161 – Survey Camp III
The course is designed to execute cadastral survey projects. The standard and practice of cadastral survey will be implemented according to the Department of Survey and Mapping Malaysia guideline.

SBEU3553 - Geographical Information System
The course is designed to give the students a basic understanding of the Geographic Information System. All related philosophies, theories and methodologies of GIS are explained. Terminology, history of GIS, basic concepts, components of GIS, Geospatial database, application and recent issues are covered.

SBEU3922 - Technical Writing
The purpose of this course is to equip students with technical communication skills. With this skill students will be able to explain geomatics technology and related disciplines to technical and non-technical audiences. Effective technical writing clarifies technical jargon; that is, it presents useful information that is clear and easy to understand for the intended audience.

SBEU3905 - Industrial Training - *Practical & Seminar*
The main objective of this course is to equip students with knowledge on land survey according to the National Land Code 1965 (Title Ownership, Subdivision, Partition, Amalgamation, Surrender and re-alienation as well as Stratum Survey), Strata Titles Act 1985 (Party wall survey), Land Acquisition, Reservation of Land, Field to Finish, Engineering Survey, Topography Survey, Hydrography Survey, Utility Mapping Survey, Coordinated Cadastral System, National Digital Cadastral Database, eCadastre and Professional Ethics.

For the seminar program, the students will share their experiences and knowledge learnt throughout their industrial attachment. The seminar will be held 3 weeks after the students have completed their 15 weeks of attachment. Students who have completed their internship program are expected to identify some related case studies, produce a report and the student's analysis of the situation. Students are also required to present their training assessment attributes such as:

- Site and operational overview
- Job content and quality of work
- Supervisor and co-workers
- Learning experience

SBEU4313 - Land Law and Survey Regulation
The main objective of this course is to equip students with knowledge on land laws and land administration such as the National Land Code, Strata Title Act, Group Settlement Act, Malay Reserve Enactment, Survey Regulations and others which are being practiced presently by professional land surveyors in Malaysia.

SBEU4942 - Undergraduate Project I
The main aim of this course is to provide students with an understanding of research and research methods in the various fields of geomatics engineering. Students should be able to acquire skills in performing literature review, design and plan their research projects and write as well as present research findings. Students will also be exposed to the practices of managing research projects.

SBEU4372 - Project Management for Surveyors
This course provides training on project planning, organizing, and managing resources towards a successful completion of specific goals in projects related to geomatics engineering. These include a project's overview; time and cost estimation; project activities and schedule; risk planning; methodology, progress monitoring and sustainability of the operating system. In addition, the course covers an overview of the project manager and his role, project variables, corrective actions identification, risk factors, project output/delivery and cost-benefit analyses.

SBEU4342 - Professional Practice
The main objective of this course is to equip students with knowledge of the laws and regulations pertaining to professional land surveyor practices, registration, professional service contracts and related legal entities.

SBEU4944 - Undergraduate Project II
The main aim of this course is to provide students with an opportunity to apply their knowledge, skills and techniques of geomatics engineering. In this course, students will acquire skills in handling and managing their research project individually and independently with the direct supervision of a supervisor.

Elective Courses

SBEU3253 – Satellite Positioning II
This course takes a systematic look at the aspects of GPS/GNSS carrier-phase measurement influencing user positioning accuracy. The course contents will consider methods and techniques mitigating the impact of various positioning errors. This includes system augmentation techniques employing real-time correction data links.

SBEU3283 – Least Square Adjustment
This course presents comprehensive principles, methodology and implementation of least square estimation (LSE) (or least square adjustment) of spatial data. In particular, it emphasises on the relevant topics of LSE, which include non-linear LSE, statistical analysis, quality of LSE, traverse adjustment, combined model, pre-analysis, solution of normal equation and sequential LSE. The course features extensive use of MATLAB and STARNET software as computational tools through group as well as individual project works.

SBEU3453 - Photogrammetry II
This course provides concepts and applications of photogrammetry as an extension of Photogrammetry I and the application of digital close-range photogrammetry. The students are exposed to the theory and practical use of relevant instruments and software through group as well as individual project works.

SBEU3403 – Remote Sensing
This subject introduces basic principles of remote sensing, emphasizing on all the basic aspects of the remote sensing process, interaction of electromagnetic radiation with objects of interest on the earth surface and in the atmosphere and platforms for acquisition of remotely sensed data. Students will learn about processing of satellite remotely sensed data with different spectral, spatial and temporal resolution in the laboratory work. At the end of the course, students will have knowledge on the basic principles of remote sensing and digital image processing, which is useful in the field of Geomatics for deriving geospatial information from the remotely sensed data, serving as the key input to the database updating for map production.

SBEU3523 - Hydrographic Surveying Technology
This subject is intended to give additional knowledge to the students concerning various technologies and techniques in support of the hydrography survey and various marine applications. The course emphasises on the principles of the hydrographic measurement, field survey preparation, system configuration and specification, procedures of data acquisition, elements of data processing and data presentation. The course covers several topics such as development in hydrographic surveying, Differential Global Positioning System, automation in hydrographic surveying, electronic chart, side scan sonar survey, multi-beam and multi-transducer seabed mapping, introduction to seismic survey, role of hydrographers in the oil industry, hydrographic survey in port developments and a brief on the law of the sea.

SBEU3893 - Map Projection
This course provides principles and concepts in map projections and its applications in surveying and mapping. The contents of this course cover basic mapping equations for plane (azimuthal), conical and cylindrical projections, geometrical characteristics of the projections, elements of distortions in map projections, and its mathematical functions. The Coordinate system and projections that are being used for surveying and mapping in Malaysia (RSO, Cassini, WGS84, GDM2000) will be introduced. The students will also be exposed on the generation of transformation modules for coordinate systems in 3D to 2D, and vice versa.

SBEU3323 - Cadastre Survey Practice
The main objective of this course is to equip students with knowledge on land survey according to the National Land Code 1965 (Title Ownership, Subdivision, Partition, Amalgamation, Surrender and re-alienation as well as Stratum Survey), Strata Titles Act 1985 (Party wall survey), Land Acquisition, Reservation of Land, Field to Finish, Coordinated Cadastral System, National Digital Cadastral Database, e-Cadastre, Multipurpose Cadastre, Marine Cadastre, Professional Ethic as well as issues and future trend in cadastre survey (3D Cadastre).

SBEU4743 - Marine Geodesy
This course provides basic concepts and knowledge on marine geodesy. The contents cover theory, methods and data processing techniques in terrestrial and satellite geodesy technology for marine geodesy. This course covers several aspects such as physical properties of seawater, marine circulation, wind-wave propagation and marine gravity. Moreover, marine geodetic infrastructure in Malaysia and its applications is also discussed.

SBEU4273 - Underground Utility Mapping
This course provides principals and understanding of underground utility surveying and mapping. The course covers several guidelines and standards that comprises different quality levels and methodology. Several important aspects are also provided such as electromagnetic waves and its propagation to ground-based soil; geophysical detection tools; electromagnetic locator and Ground Penetrating Radar; and utility database and data management. Students will also be exposed to the authority's requirements as well as updated technology in subsurface utilities installation and mapping.

SBEU4803 - Deformation Survey
This course provides principles of geodetic deformation survey and analysis for structural and ground-based deformation (landslide and crustal deformation). The course covers procedures in deformation survey, network adjustment, analysing and interpreting the deformation results. At the end of the course, students will gain experiences with several projects on deformation by applying these concepts and techniques.

SBEU4823 - Tidal Processing & Analysis
This course provides a comprehensive knowledge of tidal processing and analysis. These include exposure on the theory and principles of tidal processing; data acquisition; data management; data processing and tidal data analysis.

SBEU4833 - Terrestrial Laser Scanning
This course provides a new concept and technique of high accuracy of three-dimensional (3D) object measurement using Terrestrial Laser Scanning technology. In the course, students will be exposed to data collection and data processing using a geodetic terrestrial laser scanning technology and related point clouds processing software. At the end of the course, students will gain experiences on several projects such as landslide monitoring, structure deformation study, 3D topographic mapping and other geomatics related projects by applying these concepts and techniques.

SBEU4723 - Falak Syarie
This course provides principles and contemporary astronomical techniques that are being applied by worldwide Islamic countries including the Islamic Religious Authorities. The astronomical technique contributes to several Islamic applications such as Islamic calendar preparation, determination of Islamic daily prayer times, and direction of Qiblah.

SBEU4873 - Law of The Sea
This course provides comprehensive knowledge of the Law of the Sea such as the main legal concepts of the international legal regime governing the use of the oceans; the sea-bed and subsoil thereof; the issues related to regulations and sustainable use of ocean spaces particularly in areas beyond national jurisdiction; and also the different methods of the law of the sea as compared to national law in such matters as formulation and enforcement of the law and dispute resolution.

SBEU4853 - Geospatial Management & Implementation
This course provides guidance in selecting and implementing GIS. It presents descriptions of products offered by the top four GIS software developers. It also discusses the use of a GIS consultant to help you select and implement GIS, as well as GIS staffing issues.

SBEU4863 - Industrial Survey
This course provides students with the introduction and scope of industrial survey. It comprises background and concepts of industrial survey, methodologies and procedures of industrial survey, special instrumentations used in industrial survey and the computational aspect of industrial survey. This course also exposes students to the underground survey, which touches on the concept and its related problems as well as the methodology and instrumentation.

SBEU4913 - Marine Cadastre
The course concerns the fundamentals of marine cadastre and the needs of marine cadastre in the marine spatial planning, development and administration. The course emphasizes on the establishment of the marine cadastre system and the new requirements for sustainable marine records. It also provides an understanding of the current marine cadastre developments in Malaysia and worldwide.

SBEU4923 - Geospatial Data Analysis

This course provides an overview of spatial data analysis in Geographic Information Systems (GIS) for surveyors. Three main important areas in spatial data analysis are emphasized: visualization, exploration; and modelling. In addition, this course aims to develop both a theoretical understanding and a comprehensive practical grounding through the construction and integration of a range of spatial models. This course is roughly divided in to three parts. First is about the nature of the spatial data followed by spatial data analysis, the second part deals with the identification of spatial patterns (e.g., spatial autocorrelation, spatial clustering) and the third section refers to examples of spatial modelling.

SBEU4933 – Airborne Survey

The course provides principles for acquiring high accuracy data surveying and mapping using airborne survey techniques such as unmanned aerial vehicle (UAV), LiDAR and related mapping sensors. Students will be exposed to simulation projects such as mapping and monitoring by utilizing UAV and LiDAR.

12. Bachelor of Science in Land Administration and Development with Honours

1. Introduction

Bachelor of Science in Land Administration and Development with Honours is designed to produce graduates who are competent and knowledgeable in land matters to manage the challenges of the land administration system in the 21st century. It is the intention of this programme to make land administration as one of the professions that could enhance the land delivery system of the nation.

The sub-disciplines covered in the programme include:

- Laws on Land Administration
- Planning and Land Development
- Surveying and Information Technology
- Land Resources Management

Graduates are currently employed in public and private sectors. They are also capable of establishing their own practice offering services to clients of diverse backgrounds, relating to land administration, management and development.

The syllabus of the programme has been designed to include subjects ranging from law, policy, planning, economics, surveying, valuation, and land development to subjects on technical matters such as land information system including Geographic Information System (GIS), and the institutional set up of the Malaysian Land Administration System.

2. Name of Award

Bachelor of Science in Land Administration and Development with Honours [BSc..LAD (Hons)]

3. Programme Recognition

The *Jawatankuasa Tetap Penilaian dan Pengiktirafan Kelayakan* (JTPPK) chaired by the YB the Minister of Education in their 69th meeting on August 25, 1998 has agreed to recognize the Bachelor of Science in Land Administration and Development with Honours as follows:

“The Bachelor of Science in Land Administration and Development with Honours is hereby recognized as equivalent to other Bachelor of Science with Honours obtained from other institutions of higher education in Malaysia”.

4. Aim

The programme aims to produce land administrators and land developers who will be able to respond efficiently, transparently and endeavour for sustainability in the administration and development of land.

5. Programme Educational Objectives

The undergraduate programme in Bachelor of Science in Land Administration and Development with Honours is designed to produce graduates who will be:

PEO1 Competent and innovative in acquiring and applying knowledge towards solving land administration and development problems

PEO2 Good interpersonal skills and continuously seek for career advancement opportunity through lifelong learning

PEO3 Uphold ethical values with sense of responsibility towards organization and community

6. Programme Learning Outcomes

The intended learning outcomes of the Bachelor of Science in Land Administration and Development with Honours programme are:

PLO 1 Ability to acquire knowledge and describe principles of land administration and development.

PLO 2 Ability to apply and analyse information using appropriate land administration and development techniques and tools.

PLO 3 Ability to think critically, identify, formulate and solve problems related to land administration and development.

PLO 4 Ability to adapt to changing situations and expectations within the team towards land administration and development-based industrial needs

PLO 5 Ability to convey ideas and negotiate convincingly

PLO 6 Ability to develop digital skills for land administration and development applications

PLO 7 Ability to analyse numerical and graphical information in land administration and development.

PLO 8 Ability to lead, coordinate and manage people and organization effectively; and work collaboratively within the organization and business environment.

PLO 9 Ability to perpetually seek and acquire contemporary knowledge in land administration and development.

PLO 10 Ability to identify business opportunities and embark on entrepreneurship.

PLO 11 Ability to practice good ethics and positive values in the profession and society.

7. Accreditation

This programme obtained full accreditation from the Board of Valuers, Appraisers, Estate Agents and Property Managers and also from the Public Services Department of Malaysia.

8. Career Prospects

Bachelor of Science in Land Administration and Development with Honours graduates can be employed in the public sector, government agency and private sector.

a) Public Sector

Land Administrator in District and Land Office, Registrar in State Land and Mines Office, Development Division in Local Authority, Housing Division in State Government Secretary office and other posts at federal level namely Ministry of Housing and Local Government and Ministry of Natural Resources and Environment.

Other organizations and agencies that usually employ Land Administration graduates include agencies directly involved such as the Valuation and Property Services Department, Ministry of Finance Malaysia, Local Authority.

b) Government Agency

Urban Development Agency (UDA), Regional Development Authority (RDA), State Economic Development Corporation (SEDC), Permodalan Nasional Berhad (PNB), Lembaga Urusan & Tabung Haji, FELDA, FELCRA and other agencies that have specific division related to land administration and development field.

c) Private Sector

Property Developer, Property Consultants, Financial Institutions and other related firms.

9. Mode and Duration of Study

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

10. 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. Valuation	9	95	73.6
	B. Property Management	3		
	C. Estate Agency	3		
	D. Economics	5		
	E. Law	18		
	F. Professional Practice	3		
	G. Accounting	2		
	H. Property Investment and Finance	5		
	I. Urban Planning	3		
	J. Broad Based Knowledge Courses	44		
2. Elective Courses	K. Elective Courses	18	18	14
3. General Courses	L. General Courses	16	16	12.4
		Total credit hours to graduate	129	100

11. Award Requirements

To graduate, students must achieve a total of not less than 129 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. Pass industrial training (equivalent to 12 credit hours) and complete the undergraduate project at Year 4.

12. List of Courses According To Semester (Matriculation/STPM)

Semester 1

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBET1012 Introduction to Land Administration	E		2	17
2. SBET1022 Malaysia Legal System	E		2	
3. SBET1033 Principles and Methods of Property Valuation	A		3	
4. SBET1043 Building Technology	J		3	
5. SBET1052 Principles of Economics	D		2	
6. SBET1093 Town and Country Planning	I		3	
7. ULRS1182 Appreciation of Ethics and Civilizations (local & International)	L		2	
8. ULHM1012 Malay Language for Communication 2* (For International Student Only)	L		2	

Note: *Total sum of credit hours for local students. The total sum of credit hours for international students will consider an additional 2 credit hours for UHLM1012.

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBET1063 Contract, Agency, and Torts Law	E		3	16
2. SBET1073 Investment Valuation	A		3	
3. SBET1083 Surveying and Computation	J		3	
4. SBET2123 Property Management	B		3	
5. SBET2242 Accounting and Financial Management	G		2	
6. UHLB1112 English Communication Skills (MUET 1,2,3 & 3.5)	L	HL		
7. ULRS1012 Value and Identity	L		2	

Note: MUET Band 1, 2, 3 & 3.5 should register course UHLB1112 (HW)
HW: Compulsory Audit Course

ii. Note:* UHLB1112 detail refers to UTM.J.08.06/14.10/1/3/2 Jld 3 (15) dated 27th September 2022. HW compulsory audit course.

Semester 3

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBET2113 Applied Valuation	A		3	16
2. SBET2153 Property Taxation and Valuation	D		3	
3. SBET2133 Real Estate Law	E		3	
4. SBET2143 Database System and Management	J		3	
5. SBET4332 Alternative Dispute Resolution	E		2	
6. ULRS1022 Philosophy and Current Issues	L		2	

* ULRS1182 Appreciation of Ethics and Civilizations for Direct entry only

Semester 4

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBET3203 Real Estate Marketing and Agency	C		3	16
2. SBET2173 Building Law and Regulation	E		3	
3. SBET2163 Building Services and Maintenance	J		3	
4. SBET2183 Cadastral Surveying	J		3	
5. ULRF2xx2 Co-Curriculum Service Learning	L		2	
6. UHLB2122 Professional Communication Skills I	L	UHLB1122	2	

* ULRS1012 Philosophy and Current Issues for Direct entry only

Semester 5

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBET4522 Property and Project Financing	H		2	18
2. SBET3233 Land Acquisition Practices	E		3	
3. SBET3213 Land Development Practices	J		3	
4. SBET3223 GIS and Spatial Analysis	J		3	

5. SBET3193 Urban Land Economic	D		3	
6. ULRS3032 Entrepreneurship and Innovation	L		2	
7. UHLB3132 Professional Communication Skills II	L		2	

Semester 6

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBET3258 Industrial Training (Practical)	J		9	12
2. SBET3264 Industrial Training (Seminar)	J		3	

Semester 7

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBET4273 Development and Investment Appraisal	H		3	18
2. SBET4282 Statistic and Data Analysis	J		2	
3. SBET4302 Undergraduate Project I	J		2	
4. SBET4**3 Elective 1[1]	K		3	
5. SBET4**3 Elective 2[1]	K		3	
6. UHLX1112 Elective Foreign Language	L		2	
7. XXXX***3 Free Elective*	K		3	

Note: [1]Elective courses to be offered, choose 6 credits. Elective courses will be advised by Programme Coordinator.
* course offered by other Faculty.

Semester 8

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBET4323 Ethics and Professional Practice	F		3	16
2. SBET4314 Undergraduate Project II	J		4	
3. SBET4**3 Elective 3[1]	K		2	
4. SBET4**3 Elective 4[1]	K		3	
5. SBET4**3 Elective 5[1]	K		3	

Note: [1]Elective courses to be offered, choose 9 credits. Elective courses will be advised by Programme Coordinator.

13. Syllabus Synopses

The following syllabus synopses address 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 programme coordinator before enrolling for any of these elective courses.

Core Courses

SBET1012 - Introduction to Land Administration
Land Administration is the process of regulating land and property development and the use and conservation of the land, the gathering of revenues from the land through sales, leasing and taxation, and the resolving of conflict concerning the ownership and use of the land. Land administration functions can be divided into four: juridical, fiscal, regulatory and information management. The first three functions are traditionally organised around three set of organisations while the latter, information management is integral to the other three components. Land management is the process by which the resources of land are put to good effect. It covers all activities concerned with the management of land as a resource both from an environmental and from an economic perspective. It can include farming, mineral extraction, property and estate management and the physical planning of towns and countryside.

SBET1022 - Malaysia Legal System
This course is designed to give an understanding and knowledge of the general principles with regard to the legal system in Malaysia. It acts as a legal foundation for students before continuing with the core legal courses, i.e., the law of contract, agency & tort, offered in the following semester.

SBET1033 - Principles and Methods of Property Valuation
This course aims to provide the basics of valuation principles. It explains the scopes and areas of valuation, the concept of real estate as an investment, mathematics of valuation and the methods used in the appraisal of property valuation.

SBET1043 - Building Technology
The course aims at enabling students to provide competent valuation surveying and property management services which require a good understanding of essential aspects of buildings. The knowledge imparted to students covers the functions, design criteria, types of construction and technologies of each element of a building, the construction process, types of building material and building finishes. The elements cover the substructure and superstructure of a building. Students will also be introduced to the basic knowledge of building drawing.

SBET1052 - Principles of Economics
This course provides the basic elements of economics. It introduces to the students' basic economic principles such as the theory of firms and market organizations. This is followed by pricing mechanism, competition and

monopoly. Others topics such as allocation theory, economic rents, interest and wages, economic equilibrium and other general economic theory and some aspects of macroeconomic topics are also covered in this course.

SBET1063 - Contract, Agency and Torts Law
This course introduces students to the principles of law relating to contract, agency and torts which will be a foundation to learning real estate law. Among the aspects of law which will be focussed upon includes the formation of contract, discharge of contract, remedies for breach of contract, introduction to the law of agency, the tort of negligence and other torts relating to property. At the conclusion of this course students should be able to demonstrate an understanding of fundamental principles of the law of contract, agency and torts.

SBET1073 - Investment Valuation
The primary aim of this course is to provide students with the fundamentals of property investment. It begins with an overview of general investment types and their characteristics before focusing on property as an investment asset. The course continues with introducing the conventional methods in valuing freehold and leasehold properties. Discounted Cash Flow (DCF) methods are also discussed and compared with conventional valuation methods. In addition, students will be introduced to the techniques used in the selection of investment opportunities.

SBET1083 - Surveying and Computation
This course focuses on matters pertaining to principles, aspects and basic techniques in data measurement, processing and presentation. The techniques in establishing the planimetric and vertical controls as well as detailed survey are discussed in this course. Calculation of areas and volume of earthwork are also emphasized relating to property valuation and land development.

SBET1093 - Town and Country Planning
This course is designed to give students the understanding, knowledge and exposure on concepts, principles and systems of town and country planning applicable in Malaysia. The contents include planning concepts and principles, urban history, urban development, structure and organization of town and country planning in Malaysia, planning legislation (Act 171 and Act 172), development plans and plan making process. Students will also be taught planning control systems and the tools used to control the real estate development process.

SBET2113 - Applied Valuation
This course intends to provide a comprehensive understanding of the various aspects of applied valuation and concurrently, develop theoretical knowledge and practical skills among students and prepare them to practice valuation. The course enable students to apply valuation methods for a wide range of properties, including residential, commercial and agriculture by taking into account the economic, physical, regulatory and other information.

SBET2123 - Property Management
The primary purpose of this course is to provide students with the fundamentals of professional property management as stated in the Malaysian Property Management Practice Standards. This includes mainly the operational aspects of property management such as handing over of property, building and maintenance management, tenant/lease management, financial management, marketing management, health, safety and emergency management relating to various types of properties managed in Malaysia.

SBET2133 - Real Estate Law
This course touches upon the law relating to real estate, primarily in accordance with the National Land Code 1965 and the procedures in respect of it. It addresses the alienation of land, types of titles and ownership rights on the land, land dealings, registration and restraints on dealings.

SBET2143 - Database System and Management
The main objective of this course is to provide knowledge, exposure and skills on computer technology and the usage of information technology within the land administration and development areas of study. Besides that, this course is also designed to offer students aspects of database management systems. It concentrates on the process of establishing a database for land management and administration systems, including designing the conceptual, logical and physical models related to land information systems. This course also highlights the models and attributes within the framework of the internet, intranet and multimedia. Students will be equipped with the fundamentals of land information database management systems. By the end of the course, students should be able to understand the basic concepts of computerization and database system, and its application in relation to land and property.

SBET2153 - Property Taxation and Valuation
This course is designed to give students the knowledge on statutory valuation consisting of valuation for the purpose of property taxation. This includes legal aspects in property taxation such as rates, stamp duties, real property gains tax, development charge, land premium, quit rent and income tax. Students will also be exposed to the method and procedure to value and determine the various types of property taxations.

SBET2173 - Building Law and Regulation
This course is designed to provide students with knowledge relating to the provisions of building law and regulations for the establishment of the strata title scheme in high rise residential buildings. The related issues and problems in the current strata schemes will be highlighted and discussed. Issues such as: delay in obtaining the strata titles, determination of the subject of the strata ownership, the rights of the parcel proprietors as regards to the parcel and the common property, the allocation of the share units to parcel proprietors, the enforcement of the financial and nonfinancial obligations of the parcel proprietors, the settlement of disputes and most importantly the management issues. The present National Land Code 1965 will be investigated as it provides the basis for the ownership of the subsidiary titles.

The newly enacted Building and Common Property (Maintenance & Management) Act 2007 which provides for the proper maintenance and management of buildings and common property will also be discussed in detail. By the end of the course students should be able to explain the provisions of the Strata Titles Act in obtaining the ownership of a parcel and the provision of the Building and Common Property (Maintenance and Management) Act 2007 for the proper maintenance and management of buildings and common property; state and critically evaluate related issues and problems in the implementation of the provisions in both the Acts; and be actively involved in giving ideas and comments on selected issues related to the strata scheme.

SBET2163 - Building Services and Maintenance
The course aims at enabling students to provide competent valuation surveying and property management services which require a good understanding about essential aspects of buildings. The knowledge imparted to students covers the functions, design criteria and different types of building services, and the aspects and issues in managing the maintenance of buildings.

SBET2183 - Cadastral and Titling
Cadastral surveying (cadastre) is primarily concerned with field surveys for the marking of property boundaries on the ground, the recording of such information digitally or on plans and other cadastral documentation for land development. It relates the surveying of land boundaries to laws and regulations, as well as to the works of practicing licensed land surveyors.

SBET2242 - Accounting and Financial Management
The skills of the property profession are unique but are often seen as being narrow when compared with competitors. This course provides an opportunity to understand the financial world and how it relates to property. By the end of the course, students should be able to explain the scenario of the financial system in Malaysia and how it relates to property development, identify the categories of finance available in the financial market for land development projects and describe the innovation in project financing that are being used in the current property market. Students should also be able to propose one development project and choose the suitable types of debenture or equity finance for funding.

SBET3203 - Real Estate Marketing and Agency
This course is designed to provide students with an overview of the scope and role of Real Estate Agents in the business of property transactions, leasing, selling and buying. The focus will be given to the jurisdiction and function of agents in his approach to carry out his duty as laid out by the 1981 Act and Malaysian Estate Agency Standards, as well as practical tips to enhance the practice and professionalism of real estate agents. This course will also acquaint students with the fundamentals of marketing knowledge such as market segmentation, marketing strategy and marketing mix which are critical to the agent's success.

SBET3233 - Land Acquisition Practices
This course exposes students to land acquisition practices. Students are introduced to legislation and valuation practices based on it. Students will do a practical task on land acquisition procedures and the presentation of claims of all parties involved.

SBET3213 - Land Development Practices
This course introduces students to the knowledge of the interrelated factors that contribute to a successful land development project. It provides students with the knowledge of planning and land development practice; physical characteristics and land suitability; local governance interaction and approvals; and land development issues and innovation.

SBET3223 - GIS and Spatial Analysis
This course is designed to offer students several aspects of GIS and spatial analysis management practices. It concentrates on the aspect of the process of establishing GIS database and spatial analysis management for the land administration information system. The conceptual framework of GIS and spatial analysis management is discussed to highlight the models and attributes within the internet, intranet and multimedia framework. Students will be equipped with the fundamentals of land administration information GIS database and spatial analysis management practices.

SBET3193 - Urban Land Economics
The primary purpose of this course is to provide students with the fundamentals of land economics which relates to location theory, land value and urban growth. These are then examined in the context of the urban land development policy in Malaysia. This course examines the impact of policies on land development and land use in Malaysia. The main discussion focuses on the usage and problems in urban lands such as housing, transportation and industry, and also the roles of responsible agencies for land development.

SBET3258- Industrial Training – Practical
This course is designed to expose students to the various aspects of industrial practices and ethics and also to apply training knowledge. Students can develop the necessary skills for the preparation and delivery of a professional presentation. The industrial training placement must be related with our course such as with a land developer, land development consultant, the land office, land value consultant and GLC agencies.

SBET3264 - Industrial Training – Seminar
The purpose of the Industrial Training Seminar is to allow students to develop the necessary skills for the preparation and delivery of a professional presentation. After completing their industrial training in their third year, students are required to present a case study in a seminar. Students should realize the importance of these seminars in furthering their education and development as a professional. The skills learned will assist the student in making future presentations. Some of the skills to be learned during preparation for the student seminar include searching for the topic/issue. Students are likely to discover some of the most interesting and exciting developments in their field or related fields.

SBET4273 - Development and Investment Appraisal
This course is designed to provide students with an understanding of the introduction to property development (development theory, process, timing and market), regulations and their effects on land and property development decisions (government regulations, development control, tax etc), property development investment (property investment financial measures; financing in real estate investment; property development investment and finance), and property development appraisal (cashflow construction and sensitivity analysis, risk analysis and return).

SBET4283 - Statistics and Data Analysis
The aim of this course is to introduce students to the fundamentals of quantitative techniques in real estate. Specifically, the course covers the theories and applications of statistics in the social sciences. The related topics included in this course are: introduction to statistics and data analysis, descriptive statistics, sampling theory, basic probability, hypothesis testing, confidence interval, correlation and regression.

SBET4302 - Undergraduate Project I
This course is research based to teach students how to undertake academic research and it is a partial requirement for the award of the Bachelor in Property Management. It contains syllabi on the aspects of academic research in real estate. The goal of this course is to develop knowledge and skills among students in research disciplines in real estate. The main aspects that will be taught to students are problem formulation, setting research objectives, developing a theoretical framework through literature review, selecting and designing data collection and analysis methods, effective thesis report writing and presenting the results.

SBET4323 - Ethics and Professional Practice
This course emphasises on the etiquette and professionalism in real estate and land administration and development in the world in general and Malaysia in particular. The aim is to highlight to the students the nature of the profession, the knowledge and soft skills required as a real estate professional. Students will also be exposed to the various paths of the property professionals and the prospects awaiting them. Some aspects of ethics will also be introduced in this course.

SBET4332 – Alternative Dispute Resolution
The focus of this course is to study the major METHODS of dispute resolution i.e. litigation, arbitration and other ADR methods: their principles and procedures as outlined in the Civil Procedure Code and the Arbitration Act 2005. Students are also introduced to the various types of other methods such as the non-binding conflict management techniques (e.g. dispute review boards, dispute review advisors, negotiations), non- binding methods of dispute resolution (executive tribunal, conciliation, and mediation), and binding dispute resolution methods such as adjudication, and expert determination.

SBET4314 - Undergraduate Project II
This course is research based to teach students how to undertake academic research. This subject is a continuation of Undergraduate Project 1. Focus on this semester is to complete the project and emphasis's given to data collection, analysis of the data and findings of the study, and eventually to produce a report and article writing. Students have to present their research findings.

SBET4522 - Property and Project Finance
Students are expected to understand in general the practice of the financial system in Malaysia. Indeed, the students may learn the basic concepts of financing which is one of the main subjects in the financial system. As an introduction, financing aspects are emphasized, such as the principles, types and facilities offered and lending analysis. Furthermore, a deeper emphasis will be given to students to give an understanding of the aspects and practices of financing in property development projects. Among the areas to be emphasized are the sources of property financing available, the types offered, the parties involved and the requirements for the submitted applications. Apart from that, the lectures will also discuss various innovations and issues that arise in the finance sector, especially in property development.

Elective Courses

SBET4293 - Housing Development Law
This course is designed to discuss the theories and practical aspects of the housing industry in Malaysia. The relationship of the economic theory of housing demand and supply is highlighted and discussed. The role played by the major players of the housing industry is of the utmost importance to be identified. Laws and legislations are vital for the development of the Housing industry in Malaysia and therefore it is important to understand in detail the provisions that govern the housing industry. The housing delivery system will also be the focus of this course as without it the house cannot be delivered smoothly from the developer to the purchaser. The issues involved and encountered by the parties in the industry are identified in order to be understood and to find the solutions to the problems.

SBET4503 - Project Management
This course is designed to introduce students to project management knowledge and consists of the project manager's role, the parties involved in project management, tender, contract, procurement, project life cycle, site management, cost control and project planning and control techniques

SBET4513 - Corporate Land Management
This course is concerned with aspects of corporate real estate management; it examines the role of real estate in corporate organization. It approaches real estate management in a strategic manner that offers assistance in objective real estate decision making. This support value enhancement of corporate real estate is in order to realign real estate with business strategy. This course also incorporates the land banking role in corporate organizational goals.

SBET4533 - Rural and Regional Planning
This course gives particular emphasis on rural areas as part of the land resources for development. By introducing the phenomena or the situation of rural areas in Malaysia, certain issues, constraints, challenges and potentials can be highlighted. This will lead to matters relating to mechanisms in managing and administering land resources in the rural areas. Various institutions and organizations are involved in developing the rural areas whether for agricultural purposes or recreational and leisure activities. Besides looking at Malaysia's experiences, the experiences from other developing countries as well as the developed nations is also brought forward. The course also looks into the regional planning aspects in Malaysia as well as in other countries.

SBET4543 – Sustainable Property Development
This course provides both an introduction to sustainable development, including a general approach to sustainable thinking, and a review of the principles and practices of sustainable development as agreed by the international community of nations. The course also addresses examples of sustainability issues in land development. By the end of the course, students will be able to discuss the concept of sustainability and to apply analytical skills to assess the suitability of projects and resource use.

SBET4553 - Islamic Land Law
This course introduces students to the sources of Islamic law, the prevailing theories of ownership, with emphasis on land ownership; The extent of individual ownership, the defeasibility of title in Islamic law, the role of the state, and the rights and powers vested on individual owners concerning the use, enjoyment and transfer or transmission of the property according to Islamic law and prevailing Malay custom; The power of state to alienate, forfeit and impose taxes; The right of individuals to acquire property: grants and alienation; labour or revivification of wasteland and pre-emption; dealings, including transfer of titles, rights and interests through sales and purchase, tenancies, gifts, inter vivos and wills, charitable endowment; securities pledge, charge, jual janji, restraints on dealings; transmission and inheritance.

SBET4563 - Environmental Management
The course introduces the way to manage our environment effectively. In relation to land development, students will learn land development in sensitive areas like beaches, hilly sites, sea fronts and wetlands. The way to manage our environment is by following guidelines from acts of parliaments and related circulars. Moreover, students will study techniques to undertake Environmental Impact Assessment and Social Impact Assessment. In the end, students will have knowledge on the techniques to prepare EIA and SIA and their application within the land and real estate development process.

SBET4573 - Tenancy Law
This course presents the principles relating to the law of tenancy. In particular, it emphasizes on the creation of the relationship between the landlord and tenant, the types of leases and tenancies, the contents of a tenancy agreement, the covenants of the landlord and the tenants and the termination of tenancies as well as the implications which arose from such termination.

SBET4583 - Administrative Law
This course is designed to give an understanding and knowledge of the basic principles of Administrative law as applicable in Malaysia, and bring together the norms and principles applicable to administrative functioning and decision-making, adopting the comparative methodology by referring, at suitable places, to the law in other common law countries.

SBET4603 – Law of Succession
This course discusses about the Muslim estates and their rights, the concept of distribution of the Muslim estate, the law of succession and also the current issues on Muslim estate distribution in Malaysia.

SBET4623 – Tourism Development Studies
The course introduces the tourism industry and the significance of tourism in the national economy, the organizational structure of tourism in Malaysia, and comparable studies with other countries, basic concepts of tourism development, types of tourism, factors in encouraging the development of the tourism industry and the need for tourism planning and management

SBET4633 – Strategic Development Policy Studies
This course is designed to expose students to the roles played by the main actors involved in the formulation and implementation of public policies particularly in Malaysia. Through this course, it is expected that students should then be able to critically analyze the government's policies by evaluating the public policies' performance.

SBET4643 – Contemporary Land Development
This course was designed to discuss the rapid growth of urban development that has resulted in the use of underground land as an alternative choice for utilization of the land in the world, and Malaysia is no exception. The trend in the development of land does include the development of waterfront land. This so-called contemporary development has resulted in the rise of issues of ownership of the underground land and also the waterfront land. This course assists the student in understanding the current trends of developing the urban and suburban land for the development of the nation.

SBET4663 – Awqaf Development and Management
This course discusses awqaf definitions, concepts, principles, type, legal, management and utilization of awqaf, and also the development of awqaf properties in Malaysia.

SBET4673 – Land Information Management
This course is designed to focus on land information management theory and practices among several stakeholders and government agencies. Land information must integrate the technical and institutional aspects into a truly corporate information resource. Land information must have added value by combining information concerning use, condition, value and tenure of land, and disseminating this to the decision makers. The land

information solutions cannot be implemented in isolation and must operate within, and effectively support, the corresponding national legal, institutional and fiscal frameworks.

13. Bachelor of Real Estate with Honours

1. Introduction

The Real Estate degree programme run by the department is the first real estate degree programme in the country. This programme is mainly designed to meet the diversity of real estate professional needs in the region and worldwide. The competitiveness of the real estate industry across the region and worldwide have affected practitioner's expectations on real estate graduates from time to time. Therefore, changes on the programme syllabus were made accordingly to keep up with the fast changing needs of the industry worldwide. The changing trend in the industry from purely knowledge based professionals to knowledgeable professionals with soft skills have changed the way real estate professionals are trained. This program offers wide range of Real Estate disciplines aligned with guideline by Board of Valuers, Estate Agents, Appraisals and Property Management (BOVEAP) including; Real estate Valuation, Property Management, Economics and Finance, Law, Information and Communication Technology (ICT), and Research and Development, many others.

2. Name of Award

Bachelor of Real Estate with Honours [B.Real Estate (Hons)]

3. Programme Recognition

The first intake to the programme was first offered by the University in the 1973/74 academic session. The programme received its recognition from The Public Services Department (JPA). This professional programme also meets the requirements of the Board of Valuers, Estate Agents, Appraisers and Property Management (BOVAEP).

4. Aim

The aim of the programme is to produce knowledgeable and skilled professionals in real estate relevant areas such as property manager, valuer, estate agent, property fund manager and facilities manager. This programme will also be equipped with a positive and balanced attitude as well as to solve problems in real situations in industry. They will also train to acquire continuous learning skills in order to be specialist and skill workers in the real estate field.

5. Programme Educational Objectives

The undergraduate programme in Bachelor of Real Estate with Honours is designed to produce graduates who will be:

PEO1 Knowledgeable and proficient in mastery theories, methodologies, and technical skills in real estate discipline in-line with the industry requirement.

PEO2 Competent in addressing real estate concerns coherently, innovatively, and ethically through sustainable approaches.

PEO3 Excellent interpersonal skills and continuity of lifelong learning for career advancement in the local and international real estate industry.

6. Programme Learning Outcomes

The intended learning outcomes of the Bachelor of Real Estate with Honours programme are:

PLO1 Integrate and articulate in depth knowledge in property management related areas.

PLO2 Demonstrate intellectuality in the application of knowledge in property management.

PLO3 Apply comprehensive methods, procedures, and technical expertise in property management.

PLO4 Work together efficiently with a diverse real estate community locally and internationally.

PLO5 Communicate effectively both in written and spoken form with real estate professionals, other professionals and community.

PLO6 Utilize a broad range of basic and advanced technological applications in real estate.

PLO7 Adopt numerical and graphic data for coherent and creative solutions in real estate.

PLO8 Function individually or in teams, effectively, with a capability and responsibility to demonstrate an accountable leadership in the real estate industry.

PLO9 Self-motivated and life-long learning appreciation in the real estate profession.

PLO10 Enrich entrepreneurship skills competency for real estate career development

PLO11 Understand and commit professionally, ethically and with humane responsibility, in line with the BOVEAP standards.

7. Accreditation

This programme obtained full accreditation from several agencies in Malaysia as well at international level.

a) Department of Public Services (JPA)
b) Malaysia Qualification Agency (MQA), Ministry of Education
c) Board of Valuers, Estate Agents, Appraisals and Property Managers (BOVAEP)

8. Career Prospects

Graduates of this programme can seek employment as real estate professionals either in the public or private sector; local and overseas. The typical positions that they usually hold are:

- Valuation Executive
- Property Manager
- Facilities Manager
- Real Estate Agents
- Project Manager
- Real Estate Agency
- Real Estate Consultant
- Property Portfolio Manager
- Property Fund Manager

Accordingly, organisations and agencies that usually employ Real Estate graduates include:

- Government agencies such as Valuation and Property Services, Ministry of Finance Malaysia, local authorities and other government agencies.
- Property public listed companies such as Sunway Berhad, IOI Berhad, SBCG Group Berhad, IJM Land Berhad, etc.
- Private companies which are involved in real estate; Valuation Companies, Estate Agencies, Corporations, Hyper Market
- Property Developers
- Financial Institutions and Banks
- Corporate Real Estate Companies or Organizations such as PETRONAS, FELDA, RISDA, FELCRA, Khazanah Nasional, TM, EPF, KWAP etc.

9. Mode and Duration of Study

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

10. 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. Valuation	9	74	73.6
	B. Property Management	9		
	C. Estate Agency	3		
	D. Economics	7		
	E. Law	8		
	F. Professional Practice	3		
	G. Accounting	3		
	H. Property Investment and Finance	6		
	I. Urban Planning	3		
	J. Broad Based Knowledge Courses	23		
2. Elective Courses	K. Elective Courses	36	36	14
3. General Courses	L. General Courses	16	16	12.4
		Total credit hours to graduate	126	100

11. Award Requirements

To graduate, students must achieve a total of not less than 130 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.

12. List of Courses According To Semester (Matriculation/STPM)

Semester 1

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEH1013 Principle and method of Real Estate Valuation	A		3	15
2. SBEH1023 Introduction to Real Estate Profession	F		3	
3. SBEH1032 Malaysian Legal System	E		2	
4. SBEH1073 Surveying and Computation	J		3	
5. SBEH1052 Economics	D		2	
6. ULRS1182 Appreciation of Ethics and Civilizations (Local & International)	General		2	
7. ULHM1012 Malay Language for Communication 2* (For International Student Only)	General		2	

Note: *Total sum of credit hours for local students. The total sum of credit hours for international students will consider an additional 2 credit hours for UHLM1012.

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEH1113 Applied valuation	A		3	15
2. SBEH1043 Building Technology	B		3	
3. SBEH1093 Contract, Agency and Tort Law	E		3	
4. SBEH2102 Information Technology in Real Estate	J		2	
5. UHLB2122 Professional Communication Skills I	General	UHLB1112	2	
6. UHLB1112 English Communication Skills* (For MUET Band 1, 2 and 3.5 Only) HW	General	HL		
7. ULRS1012 Value and Identity	General		2	

Note: MUET Band 1, 2, 3 should register course UHLB1112 (HW)

iii. Note:* UHLB1112 detail refers to UTM.J.08.06/14.10/1/3/2 Jld 3 (15) dated 27th September 2022. HW compulsory audit course.

Semester 3

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEH2233 Property Finance and Accounting	G		3	16
2. SBEH2083 Town and Country Planning	I		3	
3. SBEH2133 Real Estate law	E		3	
4. SBEH2143 Land Economics	D		3	
5. SBEH3152 Statistics and Econometrics	D		2	
6. ULRS1022 Philosophy and Current Issues	General		2	

Semester 4

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEH2123 Property Management	B		3	17
2. SBEH2183 Building Service and Maintenance	B		3	
3. SBEH2063 Investment Valuation	H		3	
4. SBEH2163 Property Taxation and Land Acquisition	A		3	
5. SBEH3XX3 Elective 1	Elective		3	
6. ULRF2**2 Co-Curriculum Service Learning	General		2	

Semester 5

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEH3XX3 Elective 2	Elective		3	16
2. SBEH3XX3 Elective 3	Elective		3	
2. SBEH3XX3 Elective 4	Elective		3	
3. SBEH3203 Real Estate Marketing and Agency	C		3	
4. ULRS3032 Entrepreneurship and Innovation	General		2	
5. UHLB3132 Professional Communication Skills II	General		2	

Semester 6

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEH3XX3 Elective 5	Elective		3	17
2. SBEH3XX3 Elective 6	Elective		3	
3. SBEH3XX3 Elective 7	Elective		3	
4. SBEH3302 Undergraduate Project 1	J		2	
5. SBEH3343 Property Portfolio Management	H		3	
6. ****3 Free Elective 8	General		3	

Semester 7

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEH3XX3 Elective 9	Elective		3	18
2. SBEH3XX3 Elective 10	Elective		3	
3. SBEH4XX3 Elective 11	Elective		3	
4. SBEH4XX3 Elective 12	Elective		3	
5. SBEH4314 Undergraduate Project II	J		4	
6. UHLx1112 Elective Foreign Language	General		2	

Semester 8

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEH4264 Industrial Training – Seminar	J		4	12
2. SBEH4258 Industrial Training – Practical	J		8	

13. Elective Courses

CODE	COURSE NAME (ELECTIVE – YEAR 3)	CREDIT
SBEH3223	Economic Analysis for Real Estate	3
SBEH3173	Strata Management	3
SBEH3193	Resource sustainability	3
SBEH3293	Market research and feasibility study	3
SBEH3333	Facility management	3
SBEH3273	Business Valuation	3
SBEH3423	Asset Management	3
SBEH3353	Project Management and Construction	3

CODE	COURSE NAME (ELECTIVE – YEAR 4)	CREDIT
SBEH4213	Valuation of specialized properties, plant and machinery	3
SBEH4323	Corporate Real Estate Management	3
SBEH4283	Professional Practice	3
SBEH4953	Computer Assisted Mass Appraisal (CAMA)	3
SBEH4423	Asset Valuation	3
SBEH4373	Quality Management	3
SBEH4343	People Management in Real Estate	3
SBEH4403	Cost Estimating and Tendering	3
SBEH4363	GIS in Real Estate	3
SBEH4383	International Property Market	3
SBEH4413	Land Development	3

14. Syllabus Synopses

The following syllabus synopses address 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 programme coordinator before enrolling for any of these elective courses.

Core Courses

SBEH1013 - Principles and Methods of Real Estate Valuation
This course aims to provide the basis of valuation principles. It explains the scopes and areas of valuation, the concept of real estate as an investment, mathematics of valuation and the methods used in the appraisal of property valuation.

SBEH1023 - Introduction to Real Estate Profession
This course introduces the students to the property profession. The aim is to highlight to the students the nature of the profession, the knowledge and soft skills required as a real estate professional. Students will also be exposed to the various paths of the property professionals and the prospects awaiting them. Some aspects of ethics will also be introduced in this course.

SBEH1032 - Malaysian Legal System
This course is designed to give an understanding and knowledge of the general principles with regard to the legal system in Malaysia. It acts as a legal foundation for the students before continuing with the core legal courses, i.e., the law of contract, agency & tort, offered in the following semester.

SBEH1043 - Building Technology
The course aims at enabling students to provide competent valuation surveying and property management services which require a good understanding about essential aspects of buildings. The knowledge imparted to students covers the functions, design criteria, types of construction and technologies of each element of a building, the construction process, types of building material and building finishes. The elements cover the sub-structure and superstructure of a building. Students also will be introduced to the basic knowledge of building drawing.

SBEH1052 - Economics
This course provides the basic element of economics. It introduces to the student the basic economic principles such as the theory of firms and market organizations. This followed by the pricing mechanism, competition and monopoly. Other topics such as allocation theory, economic rents, interest and wages, economic equilibrium and other general economic theory and some aspects of macroeconomic topics are also covered in this course.

SBEH1063 - Investment Valuation
The primary aim of this course is to provide students with the fundamentals of property investment. It begins with an overview of general investment types and their characteristics before focusing on property as an investment asset. The course focuses on the income approach, covering valuation methods in valuing freehold and leasehold properties, including the residual method, investment method, profits method and Discounted Cash Flow (DCF) method. In addition, students will be introduced to various techniques to be used in the selection of investment opportunities.

SBEH1073 - Surveying and Computation
This subject focuses on matters pertaining to principles, aspects and basic techniques in data measurement, processing and presentation. The techniques in establishing the planimetric and vertical controls as well as detailed surveys are discussed in this subject. Calculation of areas and volume of earthwork are also emphasized in this subject, which relates to property valuation and land development.

SBEH1083 - Town and Country Planning
This course is designed to give understanding, knowledge and exposure on concepts, principles and system of town and country planning applicable in Malaysia. The contents are planning concept and principles, urban history, urban development, structure and organization of town and country planning in Malaysia, planning legislation (Act 171 and Act 172), development plans and plan making process. The students also will be taught about the planning control systems and the tools used to control the real estate development process.

SBEH1093 - Contract, Agency and Tort Law
This course will introduce the students to the principles of law relating to contract, agency and torts which will be a foundation to learning real estate law. Among the aspects of law which will be focussed upon includes the formation of contract, discharge of contract, remedies for breach of contract, introduction to the law of agency, the tort of negligence and other torts relating to property. At the conclusion of this course students should be able to demonstrate an understanding of fundamental principles of the law of contract, agency and torts.

SBEH2102 – Information Technology in Real Estate
The course aims to impart knowledge on the use of information technologies in real estate. It comprises both the theoretical and practical aspects of information technologies applications for real estate. For the theoretical part, students will be introduced to the basic aspects of information technologies application. This will focus on the commonly used software and latest technologies in real estate. The types of software include spreadsheet, database management systems (DBMS) and statistical packages. For the practical part, students will be given hands-on exercises on several computer programmes of the above mentioned. The course is expected to provide basic knowledge and skills for computer applications in real estate. This includes basic coding and programming.

SBEH2113 - Applied Valuation
This course intends to provide a comprehensive understanding of the various aspects of applied valuation. Concurrently, develop theoretical knowledge and practical skills among the learners and prepare them to practice valuation. The course will enable the learner to apply valuation approaches (and its methods) in carrying out his valuation on a wide range of properties, including residential, commercial, industrial, agriculture, and development land by considering the economy, physical, regulation and other factors affecting property value.

SBEH2123 - Property Management
The primary purpose of this course is to provide students the fundamentals of professional property management as stated in Malaysian Property Management Practice Standards. This includes mainly the operational aspects of property management such as handing over of property, building and maintenance management, tenant/lease management, financial management, marketing management, health, safety and emergency management relating to various types of properties managed in Malaysia.

SBEH2133 - Real Estate Law
This course touches upon the law relating to real estate, primarily in accordance with the National Land Code 1965 and the procedures in respect of it. It will address the alienation of land, types of titles and ownership rights on the land, land dealings, registration and restraint on dealings.

SBEH2143 - Land Economics
The primary purpose of this course is to provide fundamental knowledge in rural and urban land economics. The first phase introduces market interaction of land resources, theories in economic development, and land returns in rural areas. The second phase comprises urban land economic entails urbanization process underlying the economic forces in city development and city arrangement. This also includes calculation of land value from economic aspects for commercial land, industrial land, and housing land. Further, this course discusses the economic issues related to urban areas including poverty, pollution, congestion, and crimes. Nevertheless, this course also touches on urban land use policy, housing policy and local government as land development agent and market economy.

SBEH2163 – Property Taxation and Land Acquisition
This course is designed to give students the knowledge on statutory valuation consisting of valuation for the purpose of property taxation. This includes legal aspects in property taxation such as rates, stamp duties, real property gains tax, development charge, land premium, quit rent and income tax. Students will also be exposed to the method and procedure to value and determine the various types of property taxations and land acquisition practices. Students will do a practical task on land acquisition procedures and the presentation of claims of all parties involved.

SBEH2183 - Building Services and Maintenance
The course aims at enabling students to provide competent valuation surveying and property management services which require a good understanding about essential aspects of buildings. The knowledge imparted to students covers the functions, design criteria and different types of building services, and the introduction and aspects in the maintenance of buildings.

SBEH2233 - Property Finance and Accounting
The skills of the property profession are unique but are often seen as being narrow when compared with competitors. This course provides an opportunity to understand the financial world and how it relates to property. By the end of the course, students should be able to explain the scenario of the financial system in Malaysia and how it relates to property development, identify the categories of finance available in the financial market for land development projects and describe the innovation in project financing being used in the current property market. Students should also be able to propose one development project and choose the suitable types of debenture or equity finance for funding.

SBEH3152 - Statistics and Econometrics
This course introduces students to the fundamentals of quantitative techniques in real estate. Specifically, the course covers the theories and applications of statistics and econometrics for real estate analyses.

SBEH3203 - Real Estate Marketing and Agency
This course is designed to provide students with an overview of the scope and role of Real Estate Agents in the business of property transactions, leasing, selling and buying. The focus will be given to the jurisdiction and function of agents in his approach to carry out his duty as laid out by the 1981 Act and Malaysian Estate Agency Standards, as well as practical tips to enhance the practice and professionalism of real estate agents. This course will also acquaint students with the fundamentals of marketing knowledge such as market segmentation, marketing strategy and marketing mix which are critical to the agent's success.

SBEH3343 - Property Portfolio Management
Property finance are introducing to expose student on various alternative ways of making equity investments in real estate, ranging from purchasing properties like an apartment building, either as an individual or in a partnership, to investing in publicly traded companies called real estate investment trusts (REITs) that develop and own hundreds of apartment properties throughout the nation. Investments can also be made in mortgages used to finance real estate, ranging from making a mortgage loan (as a lender) or purchasing a publicly traded mortgage-backed security (residential or commercial). Furthermore, property portfolio management will provide students the fundamentals of Modern Portfolio Theory (MPT) with further discussion on Capital Market Theory (CMT) in relation to real estate investment. These two breakthroughs in financial theory have given a significant impact to financial analysts and investors in managing their investment assets. The main discussion will be the questions of: i) what is the best possible investment portfolio? And ii) what is the price of investment assets? The central of this course is the application of MPT and CMT in real estate analysis in relation to capital/financial market condition

SBEH3302 - Undergraduate Project I
This course is research based to teach students how to undertake academic research and is a partial requirement for the award of the Bachelor in Property Management. It contains syllabi on the aspects of academic research in real estate. The goal of this course is to develop knowledge and skills among students in the research discipline is real estate. The main aspects of this subject that will be taught to the students are problem formulation, setting research objectives, developing theoretical framework through literature review, selecting and designing data collection and analysis methods, effective thesis report writing and presenting the results.

SBEH4258 - Industrial Training - Practical
This course is designed to expose students to the various aspects of industrial practices and ethics and also to apply the training knowledge. Students will be placed in practical training centres at various government and private agencies throughout Malaysia and abroad. They are exposed to practical aspects of real estate. The details of industrial training are included in the Rule Book published by the faculty and university.

SBEH4264 - Industrial Training - Seminar
This course is designed to expose students to the various aspects of industrial practices and ethics and also to apply the training knowledge. Students will be placed in practical training centres at various government and private agencies throughout Malaysia and abroad. They are exposed to practical aspects of real estate. The details of industrial training are included in the Rule Book published by the faculty and university.

SBEH4314 - Undergraduate Project II
This course is research based to teach students how to undertake academic research. This subject is a continuity of Undergraduate Project 1. Focus on this semester is to complete the project and the emphasis given to data collection and analysis of data and findings of the study and eventually produce a report and article writing. Students have to present their research findings.

Elective Courses

SBEH3223 – Economic Analysis for Real Estate
This course exposes the students with the various types of economic analysis in real estate decision-making. It describes the relationship of real estate and capital markets and the various types of economic analysis in different situations. These are examined both in micro and macro terms. Aspects examined are the analysis of the urban real estate markets, labour markets, economic growth and real estate markets, housing markets, household price and financing, property market cycle, real estate market operations.

SBEH3173 – Strata Management
This course is designed to provide students with knowledge relating to the provisions of building law and Regulations for the establishment of the strata title scheme in high rise residential buildings. The related issues and problems in the current strata schemes will be highlighted and discussed. Issues such as: delay in obtaining the strata titles, the

determination of the subject of the strata ownership, the rights of the parcel proprietors as regards to the parcel and the common property, the allocation of the share units to parcel proprietors, the enforcement of the financial and non-financial obligations of the parcel proprietors, the settlement of disputes and most importantly the management issues. The present National Land Code 1965 will be investigated as it provides the basis for the ownership of the subsidiary titles. The newly enacted Strata Management Act 2013 to replace the Building and Common Property (Maintenance & Management) Act 2007 which provides for the proper maintenance and management of buildings and common property will be discussed in detail. By the ends of the course the students should be able to explain the provisions of the Strata Titles Act in obtaining the ownership of a parcel and the provision of the Strata Management Act 2013 and its Regulation for the Proper maintenance and management of building and common property; state and critically evaluate related issues and problems in the implementation of the provisions in both the Acts; to be actively involved in giving ideas and comments on selected issues related to strata scheme.

SBEH3193 – Resource Sustainability
The subject intends to provide a comprehensive understanding of environmental issues associated with real estate disciplines. This subject introduces the basic concept of natural resources as well as the fundamentals of sustainable development. It focuses on the value creation of ecosystem services and the direction of 17 Sustainable Development Goals (SGDs). This subject also provides understanding towards the current phenomenon regarding environmental issues related to real estate disciplines including energy management, solid management, and urban heat island (UHI) phenomenon in urban areas. The subject includes the relevant environmental policies, campaign, and awareness. It exposes students with the current development of green building including the green components at their benefits to the environment, economic, and social.

SBEH3293 – Market research and feasibility study
This course is designed to provide the students with an understanding of the concept of basic market analysis, microeconomic and macroeconomic base analysis and the importance of market analysis. Besides, this course also exposed students to various analyses including supply analysis, demand analysis, competitor analysis and consumer analysis. All of these analyses are followed by learning the feasibility study including the types, scopes and financial measures.

SBEH3333 - Facilities Management
This course aims to introduce the facilities management concept and its contributions in achieving organisation objectives. The course covers the main elements relevant to facilities management. It is broken into four parts: The first part sets the scene by bringing in the facilities management concept and how it has emerged as a professional discipline. The second part outlines the various competencies that are required to be a facilities manager. The third part is devoted to the roles and responsibilities of facilities management in an organisation. The fourth part covers key management functions that are important in facilities management and the sustainable concept of managing facilities.

SBEH3273 - Business Valuation
The primary purpose of this course is to provide students the fundamental and practical aspects undertaking real estate-related business valuation. The discussions are mainly on financial statement analysis and investment returns. There are three main valuation methods discussed viz. income, cost and market approaches.

SBEH3423 – Asset Management
An asset is any entity that can be used to produce a good, product or a service to meet the needs of a client. Strategic Asset Management course is designed to provide basic knowledge of asset management and prepare the students to be able to manage assets. Based on the coursework, students progressively address problems in designing and managing assets. This is achieved through a balanced program of subjects in asset management science and engineering, business administration and management and industrial engineering, with emphasis on practical applications.

SBEH3353 - Project Management and Construction
The course aims at enabling valuation surveying and property management students to acquire the essential aspects of project management, particularly a non-complex construction project. The knowledge imparted to students covers the knowledge areas and practices of project management including the project integration management, project scope management, project time management, project cost management, project quality management, project human resource management, project communication management, project risk management and project procurement management.

SBEH4213 - Valuation of specialized properties, plant and machinery
This course is designed to provide the students with an understanding of introduction to special properties, methods of valuation for special properties, valuation for residential properties and valuation for commercial properties. Besides, mining properties, industrial properties and agricultural properties are included as special properties. The methods of valuation applied to special properties are influenced by the functions of the property, business operations and the assets or machinery located in the property.

SBEH4323 - Corporate Real Estate Management
This course introduces corporate real estate management by examining the role of real estate in corporate organisations. It approaches real estate management strategically in order to assist real estate decision-making at corporate and business levels. The primary objective of such an approach is to support value enhancement of corporate organisations by aligning real estate with corporate and business strategy.

SBEH4283 - Professional Practice
This course introduces students to the professional practice of real estate, in particular, to the requirements and characteristics of a professional. The primary aim is to expose students to the nature of professional practices relating to real estate profession in Malaysia and selected markets. The highlights of the course include differences between professional and non-professionals, qualifications and requirements to be real estate professionals, code of ethics and

standards, professional negligence, setting up of professional business organization, opportunities and challenges in the field of valuation, estate agency and property management.

SBEH4953 - Computer Assisted Mass Appraisal (CAMA)
This course introduces the student to the concept of and the needs for computer assisted mass appraisal (CAMA) for the real estate professionals especially for those who work in Local Authorities and involved in valuation of properties for property taxation (assessment tax) purposes. Students will be equipped with the basic principles and concepts of mass appraisal and techniques used in mass appraisal models in the CAMA System. This course will enable students to develop professional awareness in advanced valuation techniques in valuing the universe of properties to help increase the capacity of Local Authorities in the administration of property taxation in Malaysia. The highlights of the course will include the topics such as differences between the traditional valuation and the mass appraisal techniques, the history of mass appraisal, data collection, specifying the valuation model and calibrating the valuation model for the mass appraisal application case study and the standards of mass appraisal. Students will also be exposed to the application of the real CAMA-UTM system developed by UTM which has been used by Local Authorities in Malaysia.

SBEH4423 - Asset valuation
Asset valuation is the process of determining the fair market or present value of assets, using book values, absolute valuation models like discounted cash flow analysis, option pricing models or comparable method of valuation. The primary purpose of this course is to provide students the added knowledge of professional property valuation as per Malaysia Valuation Standard. This includes mainly the valuation of special assets that deal with various asset categories such as movable assets, non-movable assets, intellectual property and biological assets. The core principles and concept of asset valuation will be exposed to the student in line with industry needs and requirements.

SBEH4373 – Quality Management
Enable valuation surveying and property management students to acquire the essential aspects of quality management in order to provide customer's satisfied services. The knowledge imparted to students covers the knowledge areas and practices of quality management including the quality management concepts, principles, requirements, implementation and performances measurement.

SBEH4343 – People management in Real Estate
This course is designed to provide student understanding and knowledge of managing people in real estate. The focus will be given to the principles and practices of people management in real estate ranging from recruitment cycle to staff performance assessment. This course will also enable the students to employ a range of strategies to manage negotiations and conflict resolution.

SBEH4403 - Cost Estimating and Tendering
This course is designed in a way to introduce the students on the principles of building estimating and tendering. It will illustrate the broad application of the theory to many estimating and tendering applications. It emphasizes the procedure of tendering and estimating, the preparation of unit rates and the estimating process for each trade of building. At the

end of the course, students should be able to understand the factors that affect the tender and perform calculations to estimate each trade of building.

SBEH4363 - GIS in Real Estate
The course aims to impart knowledge about GIS and its application in real estate. It consists of both the theoretical and practical parts of GIS application. The theoretical part will introduce the basic principles of GIS to students. This will include the definitions, the components, and the functions of GIS. Students are expected to be able to relate the theoretical aspects of GIS to the real estate knowledge or experience that they have gained through other subjects. The practical part will give students an opportunity to learn to use a selected GIS programme. This would enable them to have hands-on experience of real estate data input, data management, data analysis and data output using GIS. As a whole, this subject would provide basic knowledge and experience an undergraduate student of property management would need in order to embark on a GIS application in real estate.

SBEH4383 - International Property Market
An introduction to the international property market, focussing on the fundamental aspects that shape up different markets in different parts of the world. These aspects included those which are generally similar among countries and those which differ by geographic, cultural, political, and administrative boundaries.

SBEH4413 – Land Development
This course introduces students to the knowledge of the interrelated factors that contribute to a successful land development project. It may provide students with the knowledge of planning and land development practice; physical characteristics and land suitability; local governance interaction and approvals; and land development issues and innovation.

14. UTM PROFESSIONAL SKILLS CERTIFICATE (UTM PSC)

1. Introduction

The Ministry of Higher Education (MOHE) plays an important role in the development of human capital in Malaysia. One of the initiatives taken is to conduct students' employability programme with the aim to give students a value-added degree and enhance employment marketability among graduates.

The folowing are among the programmes offered:

- Internship
- Apprenticeship
- Entrepreneurship
- Mobility

2. Benefit

Students who attend the programme will receive a Certificate of UTM Professional Skills Programme.

The courses taken under this programme will appear in the transcript of each student.

Failure to take these 5 courses will cause the student not to graduate.

3. Couse Name and Code

Courses	Code	Year
COMPULSORY COURSES		
1. Design Thinking For Entrepreneur	GLRB0010	4
2. Talent and Competency Management	GLRM0010	4
3. English Communications Skill For Graduating Students (ECS)	GLRL0010	4
ELECTIVE COURSES		
1. Data Analytics For Organization	GLRT0010	1 - 4
2. Professional Ethics and Integrity	GLRM0020	1 - 4

3.	Construction Measurement (Mechanical & Electrical)	GLRT0020	1 - 4
4.	Oshe For Engineering Industry and Laboratory	GLRT0030	1 - 4
5.	Quality Management For Built Environment and Engineering Professionals	GLRT0050	1 - 4
6.	Safety and Health Officer Introductory Course	GLRT0060	1 - 4
7.	Industrial Machinery and Lubrication	GLRT0070	1 - 4

The short courses under The UTM Professional Skills Certificate programme are conducted on weekends i.e. Saturday and Sunday unless stated.
Students enrolled in the above short courses will be charged a fee of RM200.00. 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 https://ileague.utm.my/utm-professional-skills-certificate-utm-psc/

15. General Courses

1. Introduction

Compulsory general courses for all new students from the Ministry of Higher Education (KPT).

Compulsory courses for student all news students	Offering Faculty[1]	Status	Required Credit
Ministry of Education (KPM)		**2**	
ULRS3032 Entrepreneurship and Innovation	iLeague	1*	2

General courses are aimed at developing students' cognitive, affective and psychomotor potentials. These courses are divided into 5 clusters:

1. Appreciation of Philosophy, Value and History Cluster
2. Generic Skills Cluster
3. Knowledge Enhancement Cluster
4. Service Learning Co-Curriculum Cluster
5. Language Skills Cluster

2. Course Clusters

The total credits that undergraduate students must 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[2]	Status	Required Credit
1.0 Appreciation of Philosophy, Value and History Cluster			**6**

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

ULRS1022 Philosophy and Current Issues (Local & International)			2
UHLM1012 Malay Language for Communication 2 (International)		1*	2
ULRS1182 Appreciation of Ethics and Civilisations (Local & International)	iLeague	1*	2
		1*	
ULRS1012 Value and Identity			2

Course Cluster / List of Courses	Offering Faculty[3]	Status	Required Credit
4.0 Service Learning Cocurriculum Cluster		**2**	
a) ULRF2xx2 Co-Curriculum Service Learning There are a wide variety of co-curriculum courses available; students are advised to refer to the course descriptions published by the Institute of Life Ready Graduate (iLeague)	iLeague		2
Course Cluster / List of Courses	**Offering Faculty[4]**	**Status**	**Required Credit**
5.0 Language Skills Cluster		**6**	
UHLB1112 English Communication Skills (MUET Band 1,2 and 3.5)	AB	1*	2
Should Register course UHLB1112 (HW)	AB	1*	2
UHLB2122 professional Communication Skills I	AB	1*	2
UHLB3132 Professional Communication Skills II			
UHL**X**1112 Foreign Language Elective	AB	4	2
- UHLA1112 Arabic Language I	AB	4	2
- UHLJ1112 Japan Language I	AB	4	2
- UHLC1112 Mandarin Language I	AB	4	2
- UHLF1112 Frances Language I	AB	4	
- UHLK1112 Korean			

16. 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 development of 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.

17. 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 at the end of each academic year and short semesters are 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 all the important date 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/

18. Grading and Point Value System

1. Grading System

Students' achievement in any 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, Urban & 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 compulsory audit courses registered with a HW status, that are without grades. For these courses, students will obtain a 'HL' (Pass) or 'HG' (Fail) status. Compulsory audit courses earn credit toward a degree but not grade points.

2. 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.

3. GPA/CGPA Computation

The method of computing the GPA in one particular semester with five graded-courses and one non-graded course (course registered with a compulsory audit course [HW] status) is 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	60.32
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.

This Academic Guidebook is valid subject to new updates as at 24 September 2023

UNDERGRADUATE ACADEMIC GUIDEBOOK

Faculty of Built Environment and Surveying