UTM
UNIVERSITI TEKNOLOGI MALAYSIA

2018/2019

UNDERGRADUATE ACADEMIC GUIDEBOOK

Faculty of Built Environment and Surveying

UNDERGRADUATE ACADEMIC GUIDEBOOK

Academic Year 2018/2019

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 for science and technology.
UTM strives with total and unified effort to attain excellence in science and technology for universal peace and prosperity in accordance with His will

Vision

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

Mission

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

Motto

In the Name of God for Mankind

FACULTY OF BUILT ENVIRONMENT AND SURVEYING

The Faculty's Vision, Mission, Main Task and Objectives

Vision

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

Mission

To take the lead in the education of professionals in the built environment and surveying

Main Task

To provide professional education for built environment and surveying studies

Objectives

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

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

Foreword by the Dean

Welcome to the Faculty of Built Environment and Surveying (FABU) Universiti Teknologi Malaysia (UTM). This Guidebook contains information that I trust will prove useful about the academic programmes conducted by the Faculty.

The Faculty is one of the leading faculties offering undergraduate and postgraduate programmes in the field of Built Environment and Surveying in Malaysia. It offers undergraduate degree programmes in Architecture, Urban and Regional Planning, Quantity Surveying, Landscape Architecture, Construction, Geoinformation and Real Estate. Our programmes are accredited by a range of national and international professional bodies, including the Royal Institution of Chartered Surveyors (RICS) United Kingdom.

Both undergraduate and postgraduate programmes offered by the Faculty are well established and well regarded by employers. The Faculty also has close links with the industry, where many of our students enjoy successful careers. The QS World University Rankings by Subject, released recently ranked Faculty in the top 100, worldwide. This is a great achievement for the Faculty.

The Faculty emphasises the integration of academic knowledge and practical skills required for professional practice. Apart from imparting technical knowledge, acquisition of generic skills is vital for graduates to be competitive in the job market and successful in the future. Hence, generic skills are addressed in our courses.

International exposure is another key to success in today's complex and dynamic world. It is important for students to gain awareness and insights into foreign cultures and policies in widening their knowledge in various aspects of global issues and challenges. The opportunity for this exposure is in-built in the University's academic system through the internationalisation programmes, namely: global outreach, internship abroad, service learning and summer school programmes. The faculty strongly encourages students to participate in at least one of the internationalisation programmes during their study.

I hope students will take part in academic activities organised by the Faculty as well as portray an optimistic work culture with positive moral values in developing leadership qualities and individual generic skills. This is important not only for individual academic excellence but will also contribute to the development of the nation, towards becoming a developed country socially, culturally and politically.

If you have concerns and need more information, you may visit the Faculty's website at *builtsurvey.utm.my* or seek advice from your academic advisers, lecturers or the faculty's administrative staff.

I sincerely hope you will enjoy your time at the Faculty, and that your education here will serve you well in the future to be a great alumnus.

Professor Dr. Mohd Hamdan bin Hj. Ahmad
Dean
Faculty of Built Environment and Surveying

Introduction

Universiti Teknologi Malaysia

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

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

With a strength of more than 2,500 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 11,000 full-time undergraduate students, more than 6,000 enrolled in distance learning programmes as part-time students and more than 13,000 postgraduate students in various fields of specialisation. More than 4500 of these students are international students.

UTM has established a reputation for cutting-edge research undertakings and innovative education, proven by becoming the three-time winner for the National Intellectual Property Award for organisation category. A stimulating research culture exists in UTM through 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.

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 opportunity for synergy and collaboration between academia and students. This newly 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. While the later was initially established in 1972 as the Faculty of Surveying, before rebranded to the Faculty of Surveying and Real Estate in 1994, Faculty of Engineering and Geoinformation Science and the Faculty of Geoinformation and Real Estate.

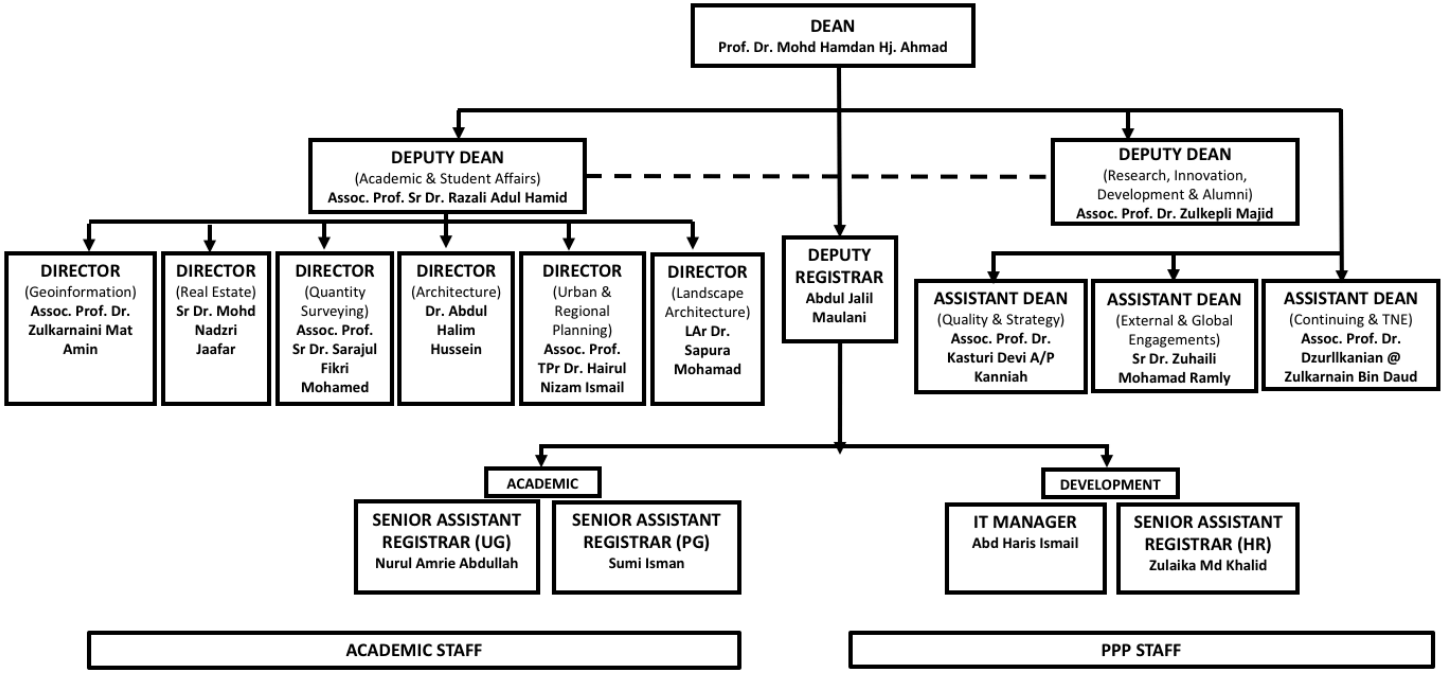
Currently the Faculty offers 9 Undergraduate degree programmes, 12 Master by Coursework programmes, 8 Master of Philosophy programmes and 8 Doctor of Philosophy programmes under 6 academic disciplines, namely Architecture, Landscape Architecture, Quantity Surveying, Urban and Regional Planning, Geoinformation and Real Estate. The student population in the faculty totals about 1,800 undergraduates and 780 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 174 academics, 97 supporting staff and our excellence in real world teaching, research and consultancy service, the faculty aspires to be a destination of choice for high quality academics.

Administration

Organisational Structure



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UNDERGRADUATE PROGRAMMES

The undergraduate programmes at the faculty consist of the following:

- Bachelor of Science in Architecture
- Bachelor of Quantity Surveying
- Bachelor of Urban and Regional Planning
- Bachelor of Landscape Architecture
- Bachelor of Science in Construction
- Bachelor of Science (Geoinformatics)
- Bachelor of Engineering (Geomatics)
- Bachelor of Science (Land Administration and Development)
- Bachelor of Science (Property Management)

Following are the details of each programme including the syllabus.

Bachelor of Science in Architecture

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

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

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

Name of Award

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

Philosophy

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

Aim

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

Programme Educational Objectives

Bachelor of Science in Architecture has 4 programme educational objectives:

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

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

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

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

Programme Learning Outcomes

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

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

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

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

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

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

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

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

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

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

Programme Accreditation

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

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

Career Prospects

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

Mode and Duration of Study

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

Classification of Courses

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

Classification	Course Group	Credits	Total credit hours	Percentage
1. Programme Core	A. Design + Communication	55	70	57
	B. Technology & Environment	6		
	C. Theory & Culture	6		
	D. Management Practice & Law	3		
2. Elective Courses	EA, EB, EC, ED Elective Courses	30	30	24
3. General Courses	F. General Courses	23	23	19
	Total credit hours to graduate		123	100

Award Requirements

To be eligible to graduate from this programme, students must complete a total of 123 credit hours or more, accumulated from courses set according to the classification scheme shown, with a minimum CGPA of 2.0.

List of Courses According to Semester

Semester 1

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEA1118 Design 1	A		8	20
2. SBEA1213 Architectural Communication	A		3	
3. SBEA1513 Architectural History & Theory	C		3	
4. UHAK1032 Introduction to Intrepreneurship	F		2	
5. UICI1012 Islamic and Asia Civilisation (Local) 6. ULAM1012 Malay Language for Communication 2 (International)	F		2	
7. UHAS1172 Malaysian Dynamics (Local) 8. UHAK1022 Malaysian Studies 3 (International)	F		2	

Semester 2

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEA1128 Design 2	A	SBEA1118	8	18
2. SBEA1223 Basic Architectural Computing	A		3	
3. SBEA1313 Structure and Construction 1	B		3	
4. ULAB1122 Academic English Skills	F		2	
5. UHAK1012 Graduate Success Attributes	D		2	

Short Semester

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

Semester 3

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEA2138 Design 3	A	SBEA1128	8	18
2. SBEA2713 Elective B (Environmental Science & Sustainability)	EB		3	
3. SBEA2523 Theory of Design	C		3	
4. ULAB2122 Advance Academic English Skills	F	ULAB1122	2	
5. UICL2302 Thinking of Science & Technology	F		2	

Semester 4

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEA2148 Design 4	A	SBEA2138	8	18
2. SBEA2323 Building Services	B		3	
3. SBEA2813 Elective C (Theory of Modern Arch)	EC	SBEA1513	3	
4. ULAX1112 Foreign Language	F		2	
5. ULAB3162 English for Professional Purposes	F	ULAB2122	2	

Short Semester

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

Semester 5

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEA3158 Design 5	A	SBEA2148	8	19
2. SBEA3623 Elective A (CADD & BIM)	EA	SBEA1223	3	
3. SBEA3723 Elective B (Structure & Construction 2)	EB	SBEA1313	3	
4. UHAK2xx2 Soft Skill Elective / UICL2xx2 Enrichment of Knowledge Elective	F		2	
5. UKQR2xx2 Co-Curriculum Service Learning	F		2	
6. UKQE3001 Extracurricular Experiential Learning	F		1	

Semester 6

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEA3169 Design 6	A	SBEA3158	9	18
2. SBEA3413 Architectural Management & Practice	C	SBEA3413	3	
3. SBEA3733 Elective B (Building Integration Performance)	EB	SBEA1313 SBEA2713 SBEA2323	3	
4. SBEA3833 Elective C (Arch Theory & Criticism)	EC	SBEA1513	3	

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. SBEA2813 Theory of Modern Architecture	EC	-	3
2. SBEA2823 Heritage Studies	EC	-	3
3. SBEA3833 Architectural Theory and Criticism	EC	-	3
4. SBEA3843 Architecture and Human Behaviour	EC	-	3
Choose three (3) from this group			
ELECTIVES GROUP D (ED)			
1. SBEA1913 Construction Practice	ED	-	3
2. SBEA1923 Outreach	ED	-	3
3. SBEA2933 Measured Drawing	ED	-	3
Choose three (3) from this group			

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

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.

SBEA1116 Design 1
Design 1 introduces students to the essential fundamental theories in architecture. Students undergo a series of projects to heighten their awareness of themselves, their reactions and perceptions toward the environment, graphical communications, anthropometrics, and experimentations in two and three dimensional composition, colour, geometry, texture and form of structures. This stage also includes art/graphics appreciation, elements of design, principles of design, architectural graphics and rendering techniques.

SBEA1213 Architectural Communication
This course introduce students to the use of communication and its role in architecture. It will covers the basic concepts and skills in manual techniques, architectural graphics skill, photography, verbal presentation, model making and the use of story-boards. The goal is to provide students with generic skills and structured knowledge. The first part of thes source covers issues related to manual techniques in presentation i.e. dry wet techniques, architectural graphics such as drawing presentations and draughtsmanship. The second part covers the basic two-dimensional representation, i.e., photography and 2D/ 3D model making. The third part of the series focuses on the issues related to applying the techniques into paintings, model making and the making of story boards such as comics.

SBEA1513 History and Theory of Architecture
The main objective of the course is to create awareness of the many kinds of architectural theories and languages of world architecture. The course provides an overview of the history of architecture in the world involving the Western and Eastern civilizations from classical to Modern times; with understanding of the social and cultural values, political traditions, technological advancements, economic achievements as well as the environments that influence the buildings and landscapes.

SBEA1128 Design 2 (pre-requisite SBEA1118 Design 1)
In Design 2, students will explore the process of designing basic architecture and acquiring the ability to synthesize various parameters of architecture. Several short projects will cover the essential parameters to explore: construction & materiality; site and environmental response; user needs and form identity. Learning includes participating in a building workshop, site testing of material, site and environmental analysis; expression construction of form, site design, client response, design process, design documentation and architectural illustration.

SBEA1223 Basic Architectural Computing
Students undergo a series of exercises to expose themselves to the multitude of software available and familiarize themselves with what each software is for and what it can and cannot do in the context of architectural education. At the end of the course, the students will be able to identify and utilize the correct software for architectural sketch modelling, graphics and 2D CAD to achieve specific objectives. This builds a foundation for students to become familiar with other more advanced software in the future.

SBEA1313 Structure and Construction 1
This course concerns conventional developments of building structures and construction methods. It deals with building construction based on four key materials namely, timber, steel, concrete and masonry as well as other composites. It provides students with basic knowledge of these materials and their applications in architectural short span (3-6m) design projects. Their various applications in different configurations of building components are expounded in the course. The lecture will be given based on the aspect of construction theory and application. Lectures are divided into two sections namely, Section 1: Timber and Steel, and Section 2: Bricks and Concrete

SBEA1913 Construction Practice
This course exposes students to real life construction sites where they are required to observe and record what they have seen in the form of a log book and a final report.

SBEA1923 Outreach Program
This Outreach Program is conducted during the short semester. It is an organisation of a project that inculcates alternative self-learning and generic skills development in related fields of architecture. It can be anin the form of event management, competitions, expeditions, travels (can be either in Malaysia or overseas-GOP). The program may also include student exchanges with other universities, academic visits and service learning. Basic requirements such as managing the transportation, accommodation, food, tools and equipment, safety and documentation are all organised by students. Team working, attitude, leadership and entrepreneurship will be the criteria for assessment.

SBEA2138 Design 3 (pre-requisite SBEA1128 Design 2)
Design 3 Studio explores architectural themes related to the socio-cultural framework of design. It focuses on the socialist and cultural/ ragional paradigm in socio-cultural pursuits and continuing regional attributes through design project. The course leads to an appreciation of social and tradition as factors and inculcates deeper understanding of human values within the function of the built environment. It promotes specific frameworks for community-based, regionalism-based and vernacular-based design activities.

SBEA2713 Environmental Science and Sustainability
The course focuses on improving the awareness of the complexity of environmental issues related to climate, solar heat gain, ventilation, natural lighting and sound on the built environment. It will explore and learn from primitive solutions to understand passive climatic design principles and develop contemporary sustainable architectural solutions. The course also provides the opportunity to conduct basic experiments on building performance with respect to climate, thermal comfort, natural ventilation, lighting and acoustics, both indoors and outdoors.

SBEA2523 Theory of Design
Design is viewed as the core discipline of architectural practice. This course is an introduction to various essential knowledge and methods of design within architecture and urban design contexts. It will cover the process of design and related parameters such as methods and knowledge on planning, design creativity, space, form, place making, behaviour, culture and sustainability.

SBEA2148 Design 4 (pre-requisite SBEA2138 Design 3)
The main intention of the second year second semester design course is to develop the students' ability to become a 'Translator' designer within the environmental design paradigm. The intelligent design includes any alternative design process (environmental), analytical thinking, site/space planning, concept, generation, using working models, design synthesis and communicating the architecture. The feasibility study will include client-user analysis, program analysis, site analysis and case studies. The design inquiries includes objectives, identity, values, aspirations, behaviour, community, structure, construction, space planning, site planning, space-form, making, place-making, building regulations and building by law. At the end of the course the student will design a medium low complexity building for a small group of users.

SBEA2323 Building Services
This course provides a basic understanding of building sciences and services for small scaled and medium complex buildings. Various topics are covered such as water supply systems, surface water disposal systems, waste and soil and water disposal systems, electrical systems, air conditioning systems, fire-fighting, lift and escalators, as well as security systems. Since the course emphasizes on the principles of the building systems, students are expected to engage in extra reading for better comprehension.

SBEA2813 Theory of Modern Architecture (pre-requisite SBEA1513 History and Theory of Architecture)
This course discusses issues relating to modern architecture involving politics, technology and aesthetics in the 19th and 20th century it also studies on various architectural theories and approaches that have a significant impact on the Malaysian architecture scenario. The current approaches in local architecture include regionalism, conservation, sustainability and environment. The contents of the four approaches cover the generic ideas as well as concepts, theories, and philosophies.

SBEA2823 Heritage Studies (pre-requisite SBEA1513 History and Theory of Architecture)
This continuing lost of traditional buildings in Malaysia has led to the need, Faculty of Built Environment and Surveying to document these remaining traditional buildings in Malaysia and the surrounding Malay world through this course subject for second year students majoring in architecture. It includes 'Historical and Cultural Documentation' conducted through a combination of 2 levels of work a historical and cultural report writing workshop(4 weeks), and a seminar (1 week). Because it is research oriented, the handling of this subject is in an ordered manner and with strict control of the proposed conventions.

SBEA2933 Measured Drawing (pre-requisite SBEA1313 Structure and Construction 1)
This course is taken in conjuction with the previous course SBEA 2823 Heritage Studies. It is conducted through a combination of 3 level of works, which is workshop (1 week), fieldwork (2 weeks) and studio work (4weeks).

SBEA3158 Design 5 (pre-requisite SBEA2148 Design 4)
This course requires students to explore the integrator role through pragmatic design approaches for a medium complexity building and its environment. Students are required to design an integrated building system that includes structure, facilities, services, construction/building detailing, materials and the tectonic potentials. Students should also demonstrate the ability to communicate their design solutions architecturally, graphically and verbally.

SBEA3623 CADD & BIM (pre-requisite SBEA1223 Basic Architectural Computing)
This course is an introduction to Building Information Modelling. Students are exposed to the available BIM software to assist them in producing a complete set of architectural working drawings with correct drawing conventions and format. The course also introduces more advanced scenarios for students to deal for more effective usage of the software prescribed and to produce better CAD technical drawings and presentation. Students are assessed by their ability to integrate information to producing 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.

SBEA3723 Structure and Construction 2 (pre-requisite SBEA1323 Structure and Construction 1)
This course is a continuation of course Structures and Construction 1. It deals with advanced performances of construction material such as timber, steel, concrete, masonry and other composites. The focus is on medium and long span building structures. The application of various construction materials for various building components such as the roof, wall, floor and stairs is highlighted based on the most advanced and current construction technology. This course is conducted in two modules namely timber and steel; followed by concrete and bricks. It will also focus on simple calculations relating to sizing of beams, columns and slabs using depth to span ratios and safe load table's for reinforced concrete.

SBEA3833 Architectural History and Criticism (pre-requisite SBEA2813 Theory of Modern Architecture)
The course surveys contemporary architecture theory and criticism from the 1950s to the present. It explores several theoretical tendencies in contemporary architecture since 1955 through close reading and discussion of original texts. These include Traditional, Postmodern, Postmodern Ecology, Late Modern, and New Modern Architecture. The aim is to understand the themes, positions and values represented in each of these theoretical tendencies in the discourse.

SBEA3169 Design 6 (pre-requisite SBEA3158 Design 5)
The comprehensive design project & dissertation at the 3rd year final semester aims to test students in comprehensiveness and sensitivity to the design problem. Students are required to identify, comprehend & apply architectural knowledge such as building integration systems composite technology, social and sustainability issues plus the building regulations leading to the building brief formulation of a medium high complexity project. Students are then required to integrate all the knowledge above to produce a final comprehensive design proposal that is buildable.

SBEA3733 Building Integration and Performance (pre-requisite SBEA1313 Structure and Construction 1)
The subject introduces the building systems integration concept for large building deliveries. A varied range of conventional and advanced building systems and their application in building design is included. The study also covers aspects of building performance appraisal.

SBEA2713 Elective B Environmental Science & Sustainability, SBEA2323 Building Services)
The course will focuses on improving the awareness of the complexity of environmental issues related to the climate including solar heat gain, ventilation, natural lighting and sound on the built environment. Explores and learns from primitive solutions in order to understand basic passive climatic design principles and develop contemporary sustainable architectural solutions. The course also provides the opportunity to conduct basic experiments on specific aspects of building performance with respect to climate, thermal comfort, natural ventilation, lighting and acoustics, both indoors and outdoors.

SBEA3413 Architectural Management and Practice
This course introduces students to the building industry, the parties involved, and their relationship with architectural practice. It covers aspects of professional core services of the architect practice in general. Students are exposed to relevant communication skills from design to practice, and from practice to all relevant parties in the building industry. Elements of building project management such as culture, technology, politics and finance as well as the methodologies involved in project management and construction management are discussed. Students will also be exposed to the type and variation of practices and the different structures of architectural practices. Local governments/ authorities involved in project management and their role, the Uniform Building By-Law and other By-laws related to the building industry and the architectural professional practice is also introduced.

SBEA3613 Digital Visualization (pre-requisite SBEA1223 Basic Architectural Computing)
The aim of the course is to enable students to utilise 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 on their ability to integrate the use of various software in order to produce a 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.

SBEA3743 Energy Conscious Design (pre-requisite SBEA2713 Environmental Science and Sustainability)
The course gives emphasis on human comfort and energy saving concept and criteria in architecture and building design. The scope of the architecture solutions may be passive or mechanical that illustrates climatic understanding and the use of appropriate technological solutions in architecture design with particular emphasis on tropical climate.

SBEA3843 Design and Human Behaviour (pre-requisite SBEA2523 Theory of Design)
The course provides the environment for the practical application of theories of design processes and behaviour. The course concerns two types of interactions, i.e. designer-based and user-based design activities. Both aspects are strongly linked to the cognitive and behavioural aspects of designers as well as users within the designing environment and designer-stakeholder (e.g. users, clients) interactions. Students would be encouraged to develop critical, systematic and inquiry-based approaches in dealing with design tasks.

Bachelor of Quantity Surveying

Introduction

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

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

Name of Award

Bachelor of Quantity Surveying [B.QS]

Philosophy

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

Aim

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

Programme Educational Objectives

Bachelor of Quantity Surveying has 5 programme educational objectives:

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

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

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

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

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

Programme Learning Outcomes

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

PLO1 Capable of acquiring knowledge and understanding of quantity surveying and related knowledge and practices.

PLO2 Capable of applying the theories and practices of building economics, construction measurement, construction procurements and contracts, construction technology, and professional practices.

PLO3 Capable to solve problems related to the field of quantity surveying by using scientific approach.

PLO4 Capable to communicate effectively with confidence orally, visually and in written form.

PLO5 Capable to think critically to resolve construction issues and related problems.

PLO6 Capable to recognize the needs, and be willing to engage in independent-study and lifelong learning by applying information management skills as well as research skills.

PLO7 Capable to function effectively as individuals, members or leaders in various teams to cope with the challenges of construction projects.

PLO8 Capable to recognise the need for, and have the preparation and ability to adapt with current demand of market environment.

PLO9 Capable to analyze the impact of global and contemporary issues, the role of Quantity Surveying on society, including health, safety, legal and cultural issues and the consequent responsibilities relevant to the profession.

PLO10 Capable to use entrepreneurial knowledge and skills to identify potential business opportunities and capable of being resilient and willing to take risks.

Accreditation

The Bachelor of Quantity Surveying programme is recognised by the Public Services Department (JPA), and accredited by the Board of Quantity Surveyors, Malaysia and the Royal Institution of Chartered Surveyors (RICS), United Kingdom. Graduates of this programme are eligible to register with the BQSM through various categories of registrations starting as Provisional Quantity Surveyors (PVQS), and later as Professional Quantity Surveyors (PQS) or Consultant Quantity

Surveyors (CQS). As the degree is internationally accredited, graduates can pursue higher degrees in universities in the United Kingdom, Australia and other countries.

Career Prospects

Graduates of the programme can work as follows 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

Mode and Duration of Study

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

Classification of Courses

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

Classification	Course Group	Credits	Total credit hours	Percentage
1. Programme Core	A. Construction Technology & Services	17	88	67
	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	20	20	15
3. General Courses	J. General Courses	23	23	18
		Total credit hours to graduate	131	100

Award Requirements

To be eligible to graduate from this programme, students must achieve a total of not less than 131 credit hours accumulated from courses that are set according to the classification scheme shown in the Classification of Courses section, with a minimum CGPA of 2.0 and fulfil other requirements stated in the UTM Academic Regulation.

List of Courses According To Semester

Semester 1

Courses	Course Group[1]	Prerequisite	Credit	Total Credit
1. SBEQ1113 Construction Technology I	A		3	18
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. UHAS1172 Malaysian Dynamics (for Local)	J		2	
7. UHAK1022 Malaysian Studies 3 (for International)				
8. UICI1012 Islamic and Asia Civilisation (for Local)			2	
9. ULAM1012 Malay Language for Communication 2 (for International)				
10. UHAK1032 Introduction to Entrepreneurship			2	

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ1123 Construction Technology II	A		3	17
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. ULAB1122 Academic English Skills	J		2	
7. UHAK1012 Graduate Success Attribute			2	

Semester 3

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ2162 Building Services II	A		2	17
2. SBEQ2273 Construction Measurement I		SBEQ1283	3	
3. SBEQ2432 Building Economics	D		2	
4. SBEQ2622 Principles of Structures	F		2	
5. SBEQ2712 Principle of Management	G		2	
6. SBEQ2722 Financial Management			2	
7. UICL2302 Sciences & Technologies Thinking	J		2	
8. ULAB2122 Advanced Academic English Skills		ULAB1122	2	

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

Semester 4

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ2233 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. SBEQ2632 Engineering Survey	F		2	
6. ULAB3162 English for Professional Purposes	J	ULAB2122	2	
7. UKQX2XX2 Co-Curriculum Service Learning[1]			2	

Note: [1]Elective courses to be offered by Co-Curriculum Service Learning Centre

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]				
8. UHAK2XX2 Elective Generic Skills	J		2	
9. UICI 2XX2 Elective Enrichment of Knowledge				
10. ULAX1112 Elective Foreign Language			2	

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

Semester 6

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ3338 Industrial Training (HW) [1]	C	SBEQ3333	8	12
2. SBEQ3344 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	17
2. SBEQ4253 Constuction 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 Constuction[1]			2	
8. SBEQ4762 Commercial Management[1]				
9. UKQE3001 Extracurricular Experiential Learning	J		1	

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

Semester 8

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEQ4283 Project Evaluation & Development	B	SBEQ4452	3	15
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]				

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

Syllabus Synopses

The syllabus synopses below cover 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. Students are encouraged to take courses offered in other programmes as free elective courses. However, students are advised to consult the head of programme coordinator before enrolling for any of these elective courses.

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.

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.

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.

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 softwares 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.

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 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 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.

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 covers 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.

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.

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.

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.

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.

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 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 will 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 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.

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.

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.

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 (prerequisite: SBEQ2423)
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 backgroundof 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 Visual Basic and 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 buildingworks to complement the need of the profession. This course will further develops 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 coversed 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.

Bachelor of Urban and Regional Planning

Introduction

The profession of urban and regional planning is concerned with the planning, designing and managing of the built environment. It is interdisciplinary in nature and integrates both the art and science of creating a better quality of life in a sustainable environment. At the local level the profession deals with the planning and designing of neighbourhoods, towns and cities 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.

Name of Award

Bachelor of Urban and Regional Planning [B.URP]

Philosophy

B.URP 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.

Aim

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

Programme 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.

Programme Learning Outcomes

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

PLO1 Articulate and discuss in a 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 Effectively and convincingly communicate planning ideas, rationales and propositions through written, visual and oral presentations to different audiences.

PLO5 Sharply define complex problems, critically analyse and interpret data, synthesise planning issues and systematically formulate, justify and evaluate alternative solutions to identified planning issues.

PLO6 Consistently demonstrate a good command of the rapidly evolving theoretical, practical and technological developments in planning and related fields through systematic and rigorous referencing to diverse sources of information.

PLO7 Effectively lead, collaborate with and empower team members, build consensus, accommodate and celebrate differences within a team towards accomplishing collective goals.

PLO8 Adapt to, embrace and capitalise upon constantly changing economic, socio-cultural, environmental, institutional and technological contexts and demands in planning and related fields.

PLO9 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.

PLO10 Adeptly recognise and innovatively act upon emerging opportunities, taking into account potential risks in resolving issues and difficult situations.

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).

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.

Mode and Duration of Study

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

Classification of Courses

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

Classification	Course Group	Credits	Total credit hours	Percentage
1. Core Courses	A. Studio	30	96	72
	B. Principal Courses	54		
	C. Industrial Training	12		
2. Elective Courses	D. Elective Courses	15	15	11
3. General Courses	E. General Courses	23	23	17
	Total credit hours to graduate		134	100

Award Requirements

To be eligible to graduate from this programme, students must complete a total of 134 credit hours or more, accumulated from courses set according to the classification scheme shown in the Classification of Courses section, with a minimum CGPA of 2.0.

List of Courses According To Semester

Semester 1

Courses	Course Group[1]	Prerequisite	Credits	Total Credits
1. SBEW1215 Studio 1: Appreciation of Cities and Human Settlements	A		5	17
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. UICI1012 Islamic and Asian Civilisation 6. ULAM1012 Malay Language for Communication 2 (International)	E		2	
7. UHAS1172 Malaysian Dynamics (Local) 8. UHAK1022 Malaysian Studies 3 (International)	E		2	

Semester 2

Courses	Course Group	Prerequisite	Credits	Total Credits
1. SBEW1225 Studio 2: Site Planning and Layout Design	A	SBEW1215	5	18
2. SBEW1623 Green Infrastructure & Utilities for Planning	B		3	
3. SBEW1713 Geospatial Analysis in Planning	B		3	
4. SBEW1723 Traffic Engineering	B		3	
5. UHAK1012 Graduate Success Attributes	E		2	
6. ULAB1122 Academic English Skills	E		2	

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. UHAK1032 Introduction to Entrepreneurship	E		2	
6. ULAB2122 Advanced Academic English Skills	E	ULAB1122	2	

Semester 4

Courses	Course Group	Prerequisite	Credits	Total Credits
1. SBEW2245 Studio 4: Development Plan	A	SBEW2235	5	17
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. UICL2302 Science and Technology Thinking	E		2	
6. UKQX2xx2 Co-curriculum Service Learning	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. ULAX1112 Foreign Language Elective	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	18
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	
7. UKQE3001 Extracurricular Experiential Learning	E		1	

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	17
2. SBEW4293 Planning Conference	B		3	
3. SBEW4463 Planning Theory	B		3	
4. SBEWXxx3 Elective 5	D		3	
5. UHAKXxx2 Soft Skills Elective ***or*** 6. UICLXxx2 Enrichment of Knowledge Elective	E		2	
7. ULAB3162 English for Professional Purposes	E	ULAB2122	2	

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

Elective Course 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.

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 phenomenan 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 inconjuction 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 livable 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 livability 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, analyze 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 producted 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, modeling 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 trend 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.

Bachelor of Landscape Architecture

Introduction

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

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

Name of Award

Bachelor of Landscape Architecture [BLA]

Philosophy

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

Aim

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

Programme Educational Objectives

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

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

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

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

PEO4 Meet the challenges of the landscape environment with professional integrity, ethics and acquiring life-long learning; and entrepreneurship skills.

Programme Learning Outcomes

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

PLO1 Comprehend theoretical, philosophical and practical dimensions of planning and design in landscape architecture in relation to culture, technology and environmental aspect.

PLO2 Awareness of the practical implications and importance of landscape architectural knowledge.

PLO3 Illustrate professional commitment and proficiency in the landscape architectural practices in compliance with the Profession's Code of Ethics and Behavior.

PLO4 Communicate the many definable facets of landscape design via visual, verbal as well as ICT means with commendable effectiveness.

PLO5 Acquire leadership and team-working skills through the process of aligning and managing the challenges of working in an organization or group.

PLO6 Make wise decisions and undertake critical evaluation and prioritizing of tasks according to relevance and importance.

PLO7 Demonstrating a capacity for independently acquiring landscape architectural knowledge diligently.

PLO8 Addressing and managing situations that have no predetermined outcomes or limited resources or clearly defined landscape design solutions.

PLO9 Demonstrate with the right mind-set to undertake entrepreneurial and management challenges.

PLO10 Demonstrate traits of an individual that is willing to address the borderless global issues and explore the different social, cultural, political, and institutional backgrounds.

Accreditation

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

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

Mode and Duration of Study

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

Classification of Courses

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

Classification	Course Group	Credits	Total credit hours	Percentage
1. Programme Core	A. Design	47	74	56
	B. Integrated Technology	14		
	C. Man & Environment	13		
2. Elective Courses	D. Elective Courses	34	34	26
3. General Courses	E. General Courses	23	23	18
	Total credit hours to graduate		131	100

Award Requirements

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

List of Courses According To Semester

Semester 1

Courses	Course Group[1]	Prerequisite	Credit	Total Credit
1. SBEZ1404 Basic Design 1	A		4	17
2. SBEZ1893 Horticulture, Nursery & Ornamental Plant Materials	C		3	
3. SBEZ1642 Design Communication	D		2	
4. SBEZ1652 Introduction to Landscape Architecture	D		2	
5. UHAS1172 Malaysian Dynamics (Local) UHAK1022 Malaysian Studies 3 (International)	E		2	
6. UHAK1032 Introduction to Entrepreneurship			2	
7. UICI1012 Islamic and Asian Civilisation (Local) ULAM1012 Malay Language for Communication 2 (International)			2	

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

Semester 2

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEZ1494 Basic Design 2	A	SBEZ1404	4	18
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. UHAK1012 Graduate Success Attributes	E		2	
7. ULAB1122 Academic English Skills			2	

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

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. UICL2302 The Thought of Sciences and Technology	E		2	
6. ULAB2122 Advance Academic English Skills			2	

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

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[1]	D		2	
6. SBEZ2933 Landscape Exploration	D		3	
7. UKQUxxx2 Co-curriculum – Service Learning	E		2	

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

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. ULAX1112 Foreign Language Elective	E		2	

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

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 Audit Course.

Semester 7

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEZ4526 Design Thesis 1	A	SBEZ3458 SBEZ3464	6	17
2. SBEZ4523 Advanced Landscape Construction 2	B	SBEZ3512	3	
3. SBEZ4852 Landscape Research	D		2	
4. SBEZ4863 Event Management	D		3	
5. SBEZ3742 Professional Mobility	D		2	
6. XXXXxxx2 Free Elective	D			
7. UKQE3001 Extracurricular Experiential Learning	E		1	

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

Semester 8

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEZ4526 Design Thesis 2	A	SBEZ4516	6	15
2. SBEZ4632 Professional Practice 3	C	SBEZ3622	2	
3. SBEZ4873 Specifications and Cost Studies	D		3	
4. ULAB3162 English for Professional Purpose	E		2	
5. XXXXxxx2 Soft Skills Elective /Enrichment of Knowledge Elective			2	

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

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. SBEZ1813	Site Planning
10. SBEZ2712	Mapping Technology
11. SBEZ2933	Landscape Exploration
12. SBEZ3843	GIS For Landscape Application
13. SBEZ4852	Landscape Research
14. SBEZ4863	Event Management
15. SBEZ4873	Specifications and Cost Studies
16. SBEZ4922	Professional Mobility
17. XXXXxxx2**	Free Elective

Note: Students must complete a minimum of 34 credits of elective courses.
** Optional for students to select any 2-credit subjects

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

SBEZ1494 Basic Design 2 (prerequisite: SBEZ1404)
This studio program encourages students to think that creating a sustainable human community requires them to value peoples needs, and fit them to the physical environment. This course aims to impart the knowledge of community planning and design to landscape architecture students so as to instil confidence in them to plan and design a public space for a community.

SBEZ1893 Horticulture, Nursery & Ornamental Plant Materials
This course is designed as an introduction to horticulture which is aimed at acquiring basic knowledge and understanding on plant attributes, classification, propagation and soil characteristics for growth. This course also incorporates an introduction to nursery establishment and management.

SBEZ1642 Design Communication
Design Communication introduces manual methods in design communication skills to students, and its role in landscape architecture. These include basic concepts, skills, and the theoretical aspects of manual methods in landscape architecture, in order to provide students with generalized skills and structured knowledge.

SBEZ1652 Introduction to Landscape Architecture
This course introduces a comprehensive appreciation of the designed landscape past and present, encompassing gardens urban and regional in scale and character. Each school of landscape is thoughts and practices initially addresses environmental, social, philosophical and artistic expressions that pertains to architecture and landscape.

SBEZ1662 Landscape Ecology
The course provides an understanding on the links or relationships of living organisms with the 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
Students are exposed to the theory, concept and principles of construction that applies to landscape design. Students learn about simple structures such as the building foundation, wall, and roof. The module also emphasizes on how to draw construction drawings for structures such as footing, wall, fence and post-and-beam construction details. The second module aims to develop students' understanding of the techniques and skills in complex landscape construction practices.

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 the creation of 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 ethno-botanical 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 mind.

SBEZ2692 Park and Recreational Planning
The Park and Recreational Planning course is designed as an introduction to the theory of park planning and design. It exposes students to the theoretical aspects of planning and park design such as historical development, principles, concepts and philosophies, beliefs and perceptions, and needs and site potential. It also focuses on the understanding of planning theory and parks design, and an awareness of current issues.

SBEZ2833 History of Landscape and Architecture
History of Landscape and Architecture introduces a comprehensive appreciation of landscape architecture and architecture of the past and relating it to the present, encompassing gardens and buildings that are historical, traditional and classical in character. Various traditional schools of thoughts and practices initially addresses environmental, social and philosophical premises as well as artistic expressions pertaining to architecture and landscape.

SBEZ2602 Heritage Landscape & Conservation
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 corporate social responsibility, 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 their ecological role in the environment by virtue of being a living organism.

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 on 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)
Industrial Training 1 is an eight-credit hour course designed for students to involve in practical training in the landscape industry. As part of the design component in the curriculum, this course aims to expose students to the professional practice in private organizations related to landscape architecture. It involves various development projects and problem-solving activities, field work (such as inventory, analyse data and design), and landscape development plans (eg; residential, institutional, industrial, business, recreation and tourism). Students are expected to understand the landscape architect is duties, administration, services, financial management and development in the firm or organization.

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
This course intends to verify the students ability in integrating knowledge, understanding and skills in Landscape Architecture. Students will be given an opportunity to select a subject and site of his or her interest (with advice from the tutors). Students shall conduct research and complete a design thesis from the problem statement stage that addresses the issue, case or reference study, and the formulation of design guidelines or theories to solve identified problems.

SBEZ4526 Design Thesis 2
The Final Comprehensive Project is the final test of a student's ability to integrate a wide range of knowledge, understanding and skills in a quasi - professional manner. It is essentially aimed at testing the comprehensiveness, sensitivity, as well as creativity in approach towards an environmental 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 emphasizes on advanced technical knowledge, focusing on theoretical as well as construction know-how of pools and fountains, outdoor lighting and irrigation.

SBEZ4922 Professional Mobility
Professional Mobility provides an opportunity for students to gather new experiences and learning environments, outside of their local culture and beyond the university design studio and its curriculum. Students are able to take part in a short design programme which is jointly organised with other external organisations.

SBEZ4863 Event Management
The course provides opportunities to organize a seminar or related activities through which the class shall learn or develop a professional relationship. The course intends to enhance students' understanding on the systematic process of seminar organization, the ability to gather critical resources, and make informed decisions. The development of generic skills is emphasized through collaborative teamwork, and the ability to communicate effectively with external parties.

SBEZ4852 Landscape Research
This course offers a framework for advancing better design thinking solutions and rationale by introducing students to a system and processes of research that could help them formulate sound and grounded arguments.

SBEZ4632 Professional Practice 3 (prerequisite: SBEZ3622)
This course is intended to develop a basic understanding in landscape management practice. This subject focuses on management and maintenance theories in landscape works operations. During the period, students are exposed to case studies that are used as a reference. Discussions also oscillate between roles of landscape architects in the management of major resources such as manpower, financial source, materials, equipment and facilities in landscape operation works.

SBEZ4873 Specifications and Cost Studies
The course intends to expose students to landscape project cost estimation methods and an awareness of the current application to costing. The course also aids students to specify landscape materials according to standard practices and methods, towards current landscape architectural projects through learning, research, case study, discussion and assignments.

Bachelor of Science in Construction

Introduction

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

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

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

Name of Award

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

Philosophy

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

Aim

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

Programme Educational Objectives

Bachelor of Science in Construction has 5 programme educational objectives:

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

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

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

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

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

Programme Learning Outcomes

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

PLO1 Ability to acquire knowledge and understanding in the area of construction management, construction technology and relevant knowledge and practice.

PLO2 Ability to apply the theory and practice of construction management, building economics, construction technology, procurement and administration of construction contracts and professional practices.

PLO3 Ability to solve problems related to the field of construction by using scientific approach.

PLO4 Ability to communicate ideas effectively, in writing and verbal.

PLO5 Ability to think critically to resolve construction issues and related problems.

PLO6 Ability to recognize the needs, and be willing to engage in independent-study and lifelong learning by applying information management skills as well as research skills.

PLO7 Ability to function effectively as individuals, members or leaders in various teams to cope with the challenges of construction projects.

PLO8 Ability to work effectively in new environment and be prepared to implement continuous improvements.

PLO9 Ability to apply high ethical and moral values in professional practice and able to analyze global impacts and contemporary issues in the field of sustainable development.

PLO10 Ability to use entrepreneurial knowledge and skills to identify potential business opportunities and capable of being resilient and willing to take risks.

Accreditation

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

Career Prospects

Graduates of the programme can work as:

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

Mode and Duration of Study

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

Classification of Courses

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

Classification	Course Group	Credits	Total credit	Percentage
1. Programme Core	A. Construction Technology & Services	15	76	58
	B. Measurement & Documentation	6		
	C. Professional Practices	17		
	D. Economics & Finance	8		
	E. Legal & Contractual Studies	6		
	F. Construction Science	8		
	G. Management	8		
	H. Information & Communications Technology (ICT)	2		
	I. Research & Development	6		

Classification	Course Group	Credits	Total credit	Percentage
2. Elective Courses	J. Elective Courses	32	32	24
3. General Courses	K. General Courses	23	23	18
	Total credit hours to graduate		131	100

Award Requirements

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

List of Courses According To Semester

Semester 1

Course	Course Group[1]	Prerequisite	Credit	Total Credit
1. SBEC1113 Construction Technology I	A		3	17
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. UHAS1172 Malaysian Dynamics (Local) 7. UHAK1022 Malaysian Studies 3 (International)	K		2	
8. UICI1012 Islamic and Asia Civilizations (Local) 9. ULAM1012 Malay Language for Communication 2 (International)			2	
10. UHAK1032 Introduction to Entrepreneurship			2	

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEC1123 Construction Technology II	A		3	17
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]			2	
7. ULAB1122 Academic English Skills	K		2	
8. UHAK1012 Graduate Success Attributes			2	

Note: [1]Elective courses to be offered, choose 2 credits. Elective courses will be advised by Programme Coordinator.

Semester 3

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEC2223 Construction Measurement I	B	SBEC1213	3	17
2. SBEC2162 Building Services II	A		2	
3. SBEC2612 Principles of Structures	F		2	
4. SBEC2722 Principles of Management	G		2	
5. SBEC2532 Land Law[1]	J		2	
6. SBEC2732 Financial Management[1]			2	
7. SBEC2742 Construction Safety[1]			2	
8. UICL2302 Science and Technology Thinking	K		2	
9. ULAB2122 Advanced Academic English Skills		ULAB1122	2	

Note: [1]Elective courses to be offered, choose 4 credits. Elective courses will be advised by 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. SBEC2233 Construction Measurement II[1]	J		3	
4. SBEC2662 Engineering Survey[1]			2	
5. SBEC2542 Construction Procurement & Dispute Resolution[1]			2	
6. SBEC2912 Introduction to Statistics[1]			2	
7. ULAB3162 English for Professional Purpose	K	ULAB2122	2	
8. UKQXXXX2 Service Learning Cocurriculum[2]			2	

Note: [1]Elective courses to be offered, choose 7 credits. Elective courses will be advised by 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. SBEC3552 Construction & Development Law[1]	J		2	
6. SBEC3852 Information Technology Applications in Built Environment[1]			2	
7. SBEC3922 Free Elective[1]			2	
8. ULAX1112 Elective Foreign Language	K		2	

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

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 & Temporary Works	F		3	18
2. SBEC4763 Construction Site Management	G		3	
3. SBEC4932 Undergraduate Project I	I		2	
4. SBEC4653 Construction Technology & Design[1]	J	SBEC2612	3	
5. SBEC4182 Sustainable Construction[1]			2	
6. SBEC4772 Commercial Management[1]			2	
7. SBEC4832 Construction Information Technology[1]			2	
8. UHAKXXX2 Generic Skills Electives	K		2	
9. UICL XXX2 Enrichment of Knowledge Electives				
10. UKQE3001 Extracurricular Experiential Learning			1	

Note: [1]Elective courses to be offered, choose 7 credits. Elective courses will be advised by Programme Coordinator.

Semester 8

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEC4343 Project Planning and Implementation	C	SBEC3633 SBEC3753	3	15
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	

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

Syllabus Synopses

The syllabus synopses below cover only the core and elective courses offered in this programme. Syllabus synopses for general courses are listed in the General Courses section. Students are encouraged to take courses offered in other programmes as free elective courses. However, students are advised to consult the 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 introduce 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 on the economic principles and its application to the construction industry. It consists of basic micro and macroeconomic principles, demand & supply, market structure, national income, money and banking, fiscal policy and budget, business cycle and economic growth. The course also provides the environment to develop students' communication skills and ability to work effectively as a team member to achieve mutual 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 softwares 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 focuses 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 objective.

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 objective.

SBEC2523 Construction Contract & Procedures (prerequisite: SBEC 1513)
The aim of this course is to introduce to the students the important clauses in construction contract. The objectives are: one; to explain to the students the principles and the implications of the main terms of construction contract, 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 buildings 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 chart 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 objective, 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 a working knowledge on construction plant 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 plant 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 to 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 cover 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 tp 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, understand 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 objective.

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 alliancing 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, risks 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 Visual Basic, Java, and object-oriented computer programming language, to learn the fundamentals of computer programming including how to write, compile and execute programs.

SBEC3922 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 requirement 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.

Bachelor of Science (Geoinformatics)

Introduction

Geoinformatics is the art and science of gathering, processing, manipulating, managing, disseminating and applying geospatial (geographic related) data. The Bachelor of Science (Geoinformatics) 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.

Name of Award

Bachelor of Science (Geoinformatics)

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 Honorable 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".

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.

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.

Programme Learning Outcomes

The intended learning outcomes of the Bachelor of Science (Geoinformatics) programme are:

PLO1	Demonstrate knowledge in geospatial field
PLO2	Apply the theory and practical skill in geospatial field.
PLO3	Conduct geospatial works in real working environment.
PLO4	Effectively communicate in delivering geospatial technical information.
PLO5	Think critically, logically and analytically in solving problems related to geospatial issues.
PLO6	Recognize the needs, and willing to engage in self- learning and life- long learning by adopting information management and research skills.
PLO7	Work individually and collaboratively as part of a group member and foster a good quality leadership skills.
PLO8	Work effectively in a new environment, are willing to adopt to changes for a continual improvement.
PLO9	Professionally respond and give opinions while at the same time uphold ethical values when dealing with current and global issues.
PLO10	Apply entrepreneurial and innovative minds in managing geospatial-related projects.

Accreditation

The Bachelor of Science (Geoinformatics) degree is recognised by Malaysian Qualification Agency (MQA) with MQR reference No.10755.

http://www2.mqa.gov.my/mqr/english/epaparIPTA_print.cfm?IdAkrKP=10755

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. Geospatialist
2. GIS/Remote Sensing Manager
3. Geospatial Data Scientist
4. GIS Analyst
5. Geospatial Database Administrator
6. GIS Programmer/Application Developer
7. GIS/Remote Sensing Project Manager
8. GIS/Remote Sensing Project Consultant

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 Petrolium 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 and Remote Sensing 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.

Mode and Duration of Study

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

Classification of Courses

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

Classification	Course Group	Credits	Total credit	Percentage
1. Programme Core	A. Geoinformation Science	26	75	57
	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	33	33	25
3. General Courses	G. General Courses	23	23	18
	Total credit hours to graduate		131	100

Award Requirements

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

List of Courses According To Semester

Semester 1

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEG1443 Principles of Geographic Information Science	A		3	16
2. SBEG1333 Survey and Mapping I	B		3	
3. SBEG1773 Mathematic for Geoinformatics	C		3	
4. SBEG1363 Computer Programming I	D		3	
5. UICI1012 Islamic and Asian Civilization (Local Student) or	G		2	
6. ULAM1012 Malay Language Communication (International Student)				
7. UHAK1012 Graduate Success Attributes or	G		2	
8. UHAK1022 Malaysian Studies 3 (International)				

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEG1373 Survey and Mapping II	B	SBEG 1333	3	17
2. SBEG1473 Principles of Photogrammetry & Remote Sensing	B		3	
3. SBEG1483 Computer Programming II	D		3	
4. SBEG1112 Geographic Studies	A		2	
5. ULAB1122 Academic English Skills	G		2	
6. UHAS1172 Malaysian Dynamics (Local Student)			2	
7. UHAK1032 Introduction to Entrepreneurship			2	

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		3	
4. SBEG2593 GPS Survey	B		3	
5. UICL2302 The Thought of Science and Technology	G		2	
6. UHAK2**2 Elective UHAK or			2	
7. UICL2**2 Elective UICL			2	

Semester 4

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEG2413 Introduction to Spatial Statistic	C		3	15
2. SBEG2153 Geospatial Database	A		3	
3. SBEG2533 Digital Image Processing	A		3	
4. SBEG2492 GIS Training Camp I	A		2	
5. ULAB2122 Advanced Academic English Skills	G		2	
6. UKQ* 2**2 Elective Co-Curriculum	G		2	

Semester 5

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEG3422 Cadastral Studies	B		2	17
2. SBEG3513 Spatial Analysis	A		3	
3. SBEG3163 System Analysis and Design	D		3	
4. SBEG3343 Spatial Algorithms and Applications	C		3	
5. SBEG3583 GIS Software System[1]	F		3	
6. SBEG3573 Digital Photogrammetry[1]	F		3	
7. ULAB3162 English for Professional Purposes	G		2	
8. UKQE3001 Extra-Curricular Experiential Learning (ExCEL)	G		1	

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

Semester 6

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEG3602 Institutional & Legal Aspect	E		2	16
2. SBEG3542 GIS Training Camp II	A		2	
3. SBEG3643 Computer Programming III [1]	F		3	
4. SBEG3603 Visualisation & System Customisation for Geoinformation[1]	F		3	
5. SBEG3553 GIS & Remote Sensing Application[1]	F		3	
6. SBEG3703 Spatio Temporal GIS[1]	F		3	
7. SBEG3453 Database Management System[1]	F		3	
8. SBEG3663 Non-Imaging Remote Sensing[1]	F		3	

Note: [1]Elective courses to be offered, choose 12 credits (4 courses). Elective courses will be advised by 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
2. SBEG4602 Undergraduate Project I	A		2	
3. SBEG4643 Spatial Data Management[1]	F		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	

Note: [1]Elective courses to be offered, choose 9 credits (3 courses). Elective courses will be advised by Programme Coordinator.

Semester 8

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEG4664 Undergraduate Project II	A		4	15
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. ULAX1112 Elective Foreign Language	G		2	

Note: [1]Elective courses to be offered, choose 9 credits (3 courses). Elective courses will be advised by Programme Coordinator.

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 skills 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 a core subject for the B. Sc. (Geoinformatic) program. It exposes student 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 hydrographical 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 continuition from of 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, the 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 consisting of several modules includes; 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 network 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 (SAD) is a broad term for describing methodologies for developing high quality Information System, which combines Information Technology (IT), people, data and process to support business requirements. The area of SAD 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 informations are 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 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, conceiving 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 a 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 an industrial training with 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 geoinformatic. 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 geoinformatic. 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 softwares 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 project. 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 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 on 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. Student 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, integrates them, and reports 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 on 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 issuess 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 principals 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 MapGuide 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 of 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 regards to GIS.

Bachelor of Engineering (Geomatics)

Introduction

Geomatics Engineering is an area of technology for measuring, managing, presentation and analising the geospatial data relating the earth. Geospatial data are obtained from various sources including observation of satellites orbiting the earth, sensors that are in the air, sea and terrestrial instruments. These data are processed and manipulated using computer and latest softwares. Also included in the area of geospatial are the computer mapping, remote sensing for monitoring the environment and positioning as well as precise navigation using Global Positioning System (GPS).

Bachelor of Engineering (Geomatics) programme, Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia is one of the oldest programme in Malaysia. Before 1994 the programme is known as Bachelor of Surveying (Land).

Name of Award

Bachelor of Engineering (Geomatics)

Programme Recognition

Full recognition obtained from:
a) Board of Land Surveyor for Peninsular Malaysia
b) Public Services Department of Malaysia

Aim

The aim of the programme is to produce graduate that is knowledgeable, expert and skillful in the field of geomatics engineering as well as capable of managing, administrating, updating geospatial data professionally.

Programme Educational Objectives

The undergraduate programme in Bachelor of Engineering (Geomatics) 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.

Programme Learning Outcomes

The intended learning outcomes of the Bachelor of Engineering (Geomatics) programme are:

PLO1	Ability to acquire knowledge of science and technology in the field of geomatics engineering
PLO2	Ability to apply and analyze information using appropriate geomatics engineering techniques and tools
PLO3	Ability to execute and manage geomatics engineering tasks using available resources
PLO4	Ability to convey ideas and negotiate convincingly
PLO5	Ability to develop critical thinking and problem solving skills in geomatics engineering
PLO6	Ability to perpetually seek and acquire contemporary knowledge in geomatics engineering
PLO7	Ability to lead, coordinate and manage people and team effectively; and work collaboratively within the team towards geomatics-based business environment
PLO8	Ability to adapt to changing situations and expectations within the team towards geomatics-based industrial needs
PLO9	Ability to practice good ethics and positive values in the profession and society of geomatics engineering
PLO10	Ability to identify business opportunities and embark on entrepreneurship in geomatics engineering

Career Prospects

Geomatics Engineering covers wide area of disciplines and many graduates joint land development and management companies that provide the survey for land ownership. Some graduates involved in land resource management, remote sensing for environment, engineering survey for construction, deformation monitoring, hydrographic survey for oil & gas exploration, and also in geographic information system (GIS).

Mode and Duration of Study

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

Classification of Courses

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

Classification	Course Group	Credits	Total credit	Percentage
1. Programme Core	A. Survey Camp	3	77	58
	B. Core Courses	69		
	C. Industrial Training	5		
2. Elective Courses	D. Elective Courses	33	33	25
3. General Courses	E. General Courses	23	23	17
	Total credit hours to graduate		133	100

Award Requirements

To graduate, students must achieve a total of not less than 133 credit hours accumulated from courses that are set according to the classification scheme shown in the Classification of Courses section, with a minimum CGPA of 2.0.

List of Courses According To Semester

Semester 1

Course	Course Group	Prerequisite	Credit	Total Credit
1. SSCE1023 Mathematics for Surveyors I	B		3	15
2. SBEU1032 Physics Theory for Surveyors	B		2	
3. SBEU1013 Fundamental of Survey & Mapping	B		3	
4. SBEU1093 Computer Programming	B		3	
5. UHAK1012 Graduate Attribute Success	E		2	
6. UHAS1172/ ULAM1012 Malaysian Dynamic (Local Student)/ Art, Custom & Belief of Malaysian (International Student)	E		2	

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. SSCE1053 Mathematic for Surveyors II - Advance Calculus	B		3	17
2. SBEU1132 Applied Physics for Surveyors	B	SBEU1032	2	
3. SBEU1503 Cartography	B		3	
4. SBEU1043 Engineering Surveying	B		3	
5. ULAB1122 Academic English Skills	E		2	
6. UICI1012/ UHAK1022 Islamic Civilisation and Asian Civilisation (Local Student)/ Malaysian Studies 3 (International) 7.			2	
8. UHAK1032 Introduction to Entrepreneurship			2	

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	A		1	
UICL2302 The Thought of Sciences and Technology	E		2	
6. UHAK2**2/ Elective UHAK/ Elective UICI UICL2**2			2	

Semester 4

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBEU2412 Introduction to Adjustment Computation	B		2	17
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. ULAB2122 Advanced English Skills	E		2	
8. UKQ*2**2 Elective Co-Curriculum Service Learning[1]			2	

Note: [1]Elective courses to be offered by Co-Curriculum Service Learning Centre

Semester 5

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBEU3XX3 Elective 1[1]	E		3	16
2. SBEU3XX3 Elective 2[1]	E		3	
3. SBEU3XX3 Elective 3[1]	E		3	
4. SBEU3213 Field Astronomy	B		3	
5. SBEU3313 Cadastral Survey	B		3	
6. SBEU3161 Survey Camp III	A		1	

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 6 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	15
2. SBEU4XX3 Elective 9[1]	D		3	
3. SBEU4313 Land Law and Survey Regulation	B		3	
4. SBEU4942 Undergraduate Project I	B		2	
5. ULA*1112 Elective Foreign Language	E		2	
6. ULAB3162 English for Professional purposes			2	

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	15
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. UKQE3001 Extracurricular Experiential Learning	E		1	

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

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	Cadaster 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

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 these 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 fundamental 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. Student 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 survey. 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 plannimetric and vertical control establishments. This involves field work practicals (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 of error in measurement, random variables, weight of observation, and observation on linear equation. 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 of 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 advance theory on geodesy that comprises of 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 of 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 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 on user positioning accuracy. The course contents will considers 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 a MATLAB and STARNET software as computational tools through group as well as individual project works.

SBEU3453 - Photogrammetry II
This course provides concept and applications of the 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 sea water, 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 of 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 authorities requirements as well as updated technology in subsurface utilities installation and mapping.

SBEU4803 - Deformation Survey
This course provides principals of geodetic deformation survey and analysis for structural and ground-based deformation (land slide 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 technique.

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 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 technique.

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 of 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 modeling. 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.

Bachelor of Science (Land Administration and Development)

Introduction

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

The sub-disciplines covered in the programme include:

- Property Development
- Property Valuation
- Property Marketing
- Property Investment
- Property Economics
- Law

Graduates are currently employed in public and private sectors. They are also capable to establish 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.

Name of Award

Bachelor of Science (Land Administration and Development)

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 as follows:

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

Aim

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

Programme Educational Objectives

The undergraduate programme in Bachelor of Science (Land Administration and Development) 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

Programme Learning Outcomes

The intended learning outcomes of the Bachelor of Science (Land Administration and Development) programme are:

PLO1 Ability to acquire knowledge and describe principles of land administration and development.

PLO2 Ability to analyze information using appropriate land administration and development techniques and tools.

PLO3 Ability to think critically, identify, formulate and solve problems related to land administration and development.

PLO4 Ability to convey ideas, negotiate convincingly

PLO5 Ability to develop critical thinking and problem solving skills.

PLO6 Ability to perpetually seek and acquire contemporary knowledge in land administration and development.

PLO7 Ability to lead, coordinate and manage people and organization effectively; and work collaboratively within the organization and business environment.

PLO8 Ability to adapt to changing situations and expectations within the organization and business environment.

PLO9 Ability to practice good ethics and positive values in the profession and society.

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.

Career Prospects

Bachelor of Science in Land Administration and Development graduates can be employed in 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 includes Agency directly involve such as 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.

Mode and Duration of Study

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

Classification of Courses

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

Classification	Course Group	Credits	Total credit	Percentage
1. Programme Core	A. Valuation	32	95	71.4
	B. Laws on Land Administration	15		
	C. Planning and Land Development	6		
	D. Surveying and Information Technology	12		
	E. Economic	5		
	F. Research and Development	6		
	G. Others	19		
2. Elective Courses	H. Elective Courses	15	15	11.3
3. General Courses	I. General Courses	23	23	17.3
	Total credit hours to graduate		133	100

Award Requirements

To graduate, students must achieve a total of not less than 133 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.

List of Courses According To Semester

Semester 1

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBET1012 Introduction to Land Administration	B		2	16
2. SBET1022 Malaysia Legal System	B		2	
3. SBET1033 Principles and Methods of Property Valuation	A		3	
4. SBET1043 Building Technology	A		3	
5. SBET1052 Principles of Economics	E		2	
6. UICI1012 Islamic and Asian Civilization	I		2	
7. UHAK1012 Graduate Success Attributes	I		2	
8. ULAM1012 Bahasa Melayu Komunikasi 2 (International Student)	I		2	

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBET1063 Contract, Agency, and Torts Law	B		3	18
2. SBET1073 Investment Valuation	A		3	
3. SBET1083 Surveying and Computation	D		3	
4. SBET1093 Town and Country Planning	C		3	
5. ULAB1112 Academic English Skills	I		2	
6. UHAS1172/UHAK1022 Malaysian Dynamic (Local Student)/ Malaysian Studies 3 (International)	I		2	
7. UHAK1032 Introduction of Entrepreneurship	I		2	

Semester 3

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBET2113 Applied Valuation	A		3	16
2. SBET2123 Property Management	A		3	
3. SBET2133 Real Estate Law	B		3	
4. SBET2143 Database System and Management	D		3	
5. UICL2302 The thought of Science and Technology	I		2	
6. UHAK2**2/UICL2**2 Elective UHAK or Elective UICL	I		2	

Semester 4

Course	Course Group	Prerequisite	Credit	Total Credit
1. SBET2153 Property Taxation and Valuation	A		3	18
2. SBET2173 Building Law and Regulation	B		3	
3. SBET2163 Building Services and Maintenance	A		3	
4. SBET2183 Cadastral Surveying	D		3	
5. SBET2242 Accounting and Financial Management	G		2	
6. ULAB2122 Advance Academic English Skills	I		2	
7. UKQ*2**2 Elective Co-curriculum[1]	I		2	

[1]Elective courses to be offered by Co-Curriculum Service Learning Centre

Semester 5

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBET3203 Real Estate Marketing and Agency	A		3	18
2. SBET3233 Land Acquisition Practices	A		3	
3. SBET3213 Land Development Practices	C		3	
4. SBET3223 GIS and Spatial Analysis	D		3	
5. SBET3193 Urban Land Economic	E		3	
6. ULAB3162 English for Professional Purposes	I		2	
7. UKQE3001 Extracurricular Experiential Learning	I		1	

Semester 6

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBET3258 Industrial Training (Practical)	G		8	12
2. SBET3264 Industrial Training (Seminar)	G		4	

Semester 7

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBET4273 Development and Investment Appraisal	A		3	18
2. SBET4282 Statistic and Data Analysis	G		2	
3. SBET4302 Undergraduate Project I	F		2	
4. SBET4**3 Elective 1[1]	H		3	
5. SBET4**3 Elective 2[1]			3	
6. SBET4**3 Elective 3[1]			3	
7. ULA*1112 Elective Foreign Languange			2	

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

Semester 8

Courses	Course Group	Prerequisite	Credit	Total Credit
1. SBET4323 Ethics and Professional Practice	G		3	17
2. SBET4332 Alternative Dispute Resolution	B		2	
3. SBET4314 Undergraduate Project II	F		4	
4. SBET4522 Property and Project Financing	A		2	
5. SBET4**3 Elective 4[1]	H		3	
6. SBET4**3 Elective 5[1]			3	

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

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 sub-structure 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 aspect 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 plannimetric 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 studenta 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 system, including designing the conceptual, logical and physical models related to land information system. 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 system. 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 building. 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 to 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 aland 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 finding.

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 area 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 to 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 encounters by the parties in the industry is 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, intervivos 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 sub urban land for the development of the nation.

SBET4663 – Awqaf Development and Management
This course discusses about 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.

Bachelor of Science (Property Management)

Introduction

The property management degree programme run by the department is the first real estate degree programme in the country. The programme is mainly designed to meet the different real estate professional needs in the region. From time to time changes were made to the programme to reflect the changing needs of the industry.

The competitiveness of the real estate industry across the region has affected practitioner's pectation of graduates in the field. The changing trend in the industry from purely knowledge based professionals to one with knowledge and human skills have change the way real estate professionals are trained. Currently the outcome-based education (OBE) is being practiced here to ensure that the objectives of the programs are attained.

The sub-disciplines covered in the programme include:

- Property Management
- Property Valuation
- Building Services and Maintenance
- Facilities Management
- Property Marketing
- Property Investment
- Property Portfolio Management
- Property Development
- Application of Computer in Real Estate
- Property Law
- Property Economics
- Property Finance

Name of Award

Bachelor of Science (Property Management)

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 requirement to accredited by Board of Valuers, Estate Agents, Appraisals and Property Management (BOVEAP). At the international level, property management programme in UTM also received accredited from Royal Institution Chartered Surveyors (RICS), United Kingdom.

Aim

The aim of the programme is to produce knowledgeable and skill professional in real estate relevant areas such as property manager, valuer, estate agent, property fund manager and facilities manager. This programme will also able to equipped with positive and balance 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 worker in the real estate field.

Programme Educational Objectives

The undergraduate programme in Bachelor of Science (Property Management) is designed to produce graduates who will be:

PEO1	Graduates possess a range of learning in acquiring relevant theories, methodologies, techniques, and skills to develop a capacity for creative thinking and problem solving in real estate.
PEO2	Graduates value and practice a culture of continuous learning, adaptability and innovativeness in real estate 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 property management, valuation estate agents and appraisals and beyond locally and globally.
PEO4	Graduates demonstrate awareness and sensitivity among students about the roles of real estate professional in achieving socioeconomically and culturally responsive, economically visible and sustainable development.

Programme Learning Outcomes

The intended learning outcomes of the Bachelor of Science (Property Management) programme are:

PLO1	Ability to acquire knowledge and describe principles of real estate.
PLO2	Ability to analyse information using appropriate property techniques and tools.
PLO3	Ability to think critically, identify, formulate and solve problems related to Real estate.
PLO4	Ability to convey ideas and negotiate convincingly.
PLO5	Ability to develop critical thinking and problem solving skills.
PLO6	Ability to perpetually seek and acquire contemporary knowledge in Real estate.
PLO7	Ability to lead, coordinate and manage people and organization effectively; and work collaboratively within the organization and business environment.
PLO8	Ability to adapt to changing situations and expectations within the organization and business environment.
PLO9	Ability to practice good ethics and positive values in the profession and society.

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 (BOVEAP)
d) Royal Institution of Chartered Surveyors (RICS), United Kingdom

Career Prospects

Graduates of this programme can seek employment as real estate professional 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, Department of Lands and Mines and State Governments
- Organisation related to the real estate investment such as Real Estate Investment Trusts (REITs) companies
- Private companies which are involve in real estate; Valuation Companies, Estate Agencies, Corporations, Hyper Market
- Property Developers
- Listed Property Companies
- Financial Institutions and Banks
- Corporate Real Estate Companies such as PETRONAS, FELDA, RISDA, FELCRA, Khazanah Nasional, TM, KWSP, KWAP

Mode and Duration of Study

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

Classification of Courses

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

Classification	Course Group	Credits	Total credit	Percentage
1. Programme Core	A. Valuation	12	74	56
	B. Property Management	12		
	C. Investment	2		
	D. Law	11		
	E. Economics	8		
	F. Information & Communications Technology (ICT)	2		
	G. Research & Development	6		
	H. Others	21		
2. Elective Courses			36	27
3. General Courses			23	17
			133	100

Award Requirements

To graduate, students must achieve a total of not less than 133 credit hours accumulated from courses that are set according to the classification scheme shown in the Classification of Courses section, with a minimum CGPA of 2.0.

List of Courses According To Semester

Semester 1

Course	Course Group	Prerequisite	Credit	Total Credit
1. SGHH1013 Principle and method of valuation	A		3	17
2. SGHH1023 Introduction to Real Estate Profession	Others		3	
3. SGHH1032 Malaysian legal system	D		2	
4. SGHH1043 Building technology	B		3	
5. SGHH1052 Principles of Economics	E		2	
6. UICI1012 Islamic and Asian Civilisation (Local Student)	General		2	
7. UHAS1172 Malaysian Dynamic (Local Student)	General		2	
8. UHAK1022 Malaysian Studies 3 (International Student)	General		2	
9. ULAM1012 Malay Language Communication 2 (International Student)	General		2	

Semester 2

Course	Course Group	Prerequisite	Credit	Total Credit
1. SGHH1063 Investment valuation	A		3	18
2. SGHH1073 Surveying and Computation	Others		3	
3. SGHH1083 Town and country planning	E		3	
4. SGHH1093 Contract, Agency and Torts Law	D		3	
5. UHAK1032 Introduction to Entrepreneurship	General		2	
6. ULAB1122 Academic English Skills	General		2	
7. UHAK1012 Graduate Success Attributes	General		2	

Semester 3

Course	Course Group	Prerequisite	Credit	Total Credit
1. SGHH2102 Computer Application in Real Estate	F		2	18
2. SGHH2113 Applied Valuation	A		3	
3. SGHH2123 Property Management	B		3	
4. SGHH2133 Real Estate law	D		3	
5. SGHH2143 Land Economics	E		3	
6. UICL2302 The Thought of Sciences and Technology	General		2	
7. UHAK2XX2 / UICL2XX2 Generic Skills Course / Knowledge Enhancement Course	General		2	

Semester 4

Course	Course Group	Prerequisite	Credit	Total Credit
1. SGHH2152 Statistics and Econometrics	C		2	18
2. SGHH2163 Statutory Valuation	A	SGHH1013	3	
3. SGHH2173 Building Law and Regulations	D		3	
4. SGHH2183 Building Services and Maintenance	B	SGHH1013	3	
5. SGHH3193 Environmental Studies	Others		3	
6. ULAB2122 Advanced Academic English Skills	General	ULAB1122	2	
7. UKQX2XX2 Co-Curriculum Service Learning	General		2	

Semester 5

Course	Course Group	Prerequisite	Credit	Total Credit
1. SGHH3203 Real Estate Marketing and Agency	B		3	18
2. SGHH3213 Valuation of Specialised Properties	Elective	SGHH1013	3	
3. SGHH3223 Economic Analysis for Real Estate	Elective		3	
4. SGHH3233 Real Estate Investment	Elective		3	
5. SGHH3243 Land Acquisition Practices	Elective		3	
6. UKQE3001 Extracurricular Experiential Learning	General		1	
7. ULAB3162 English for Professional Purposes	General	ULAB2122	2	

Semester 6

Course	Course Group	Prerequisite	Credit	Total Credit
1. SGHH3259 Industrial Training - Practical	Others		9	12
2. SGHH3263 Industrial Training - Seminar	Others		3	

Semester 7

Course	Course Group	Prerequisite	Credit	Total Credit
1. SGHH4273 Business Valuation	Elective		3	17
2. SGHH4093 Professional Practice	Elective		3	
3. SGHH4293 Development and Investment Appraisal	Elective		3	
4. SGHH4302 Undergraduate Project 1	G		2	
5. SGHH4xx3 Elective 1	Elective		3	
6. SGHH4xx3 Elective 2	Elective		3	

Semester 8

Course	Course Group	Prerequisite	Credit	Total Credit
1. SGHH4314 Undergraduate Project 2	G		4	15
2. SGHH4323 Property Business Management	Elective		3	
3. SGHH4353 Project Management	Elective		3	
4. SGHH4363 GIS in Real Estate	Elective		3	
5. ULAx1112 Elective Foreign Language	General		2	

Elective Courses

Code	Name of Courses	Credit	Pre-Requisite
SGHH3223	Economic Analysis for Real Estate	3	NONE
SGHH3233	Real Estate Investment	3	NONE
SGHH3243	Land Acquisition Practices	3	NONE
SGHH4273	Asset Valuation	3	NONE
SGHH4283	Professional Practice	3	NONE
SGHH4293	Development and Investment Appraisal	3	NONE
SGHH4323	Property Business Management	3	NONE
SGHH4343	Property Portfolio Management	3	SGHH 3233
SGHH4353	Project Management	3	NONE
SGHH4363	GIS in Real Estate	3	NONE
SGHH4333	Facilities Management	3	SGHH 2123
SGHH4373	Quality Management	3	NONE
SGHH4383	International Property Market	3	NONE
SGHH4393	Computer Assisted Mass Appraisal (CAMA)	3	NONE
SGHH4403	Cost Estimating and Tendering	3	NONE
SGHH4413	Land Development	3	NONE
SGHH4423	Islamic Principle of Real Estate	3	NONE
SGHH4433	Plant and Machinery Valuation	3	NONE

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

SGHH1013 - Principles of Valuation and Methodology
This course aims to provide students with basic 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.

SGHH1023 - Introduction to Real Estate Profession
This course introduces students to the property profession. The aim is to highlight to the students the nature of the profession, and 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.

SGHH1032 - Malaysian Legal System
This course is designed to give an understanding and knowledge of the general principles of the legal system in Malaysia. It acts as a foundation for students before continuing with the core legal courses, i.e., the laws relating to real property, offered in the forthcoming session.

SGHH1043 - 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. Student will also be introduced to the basic knowledge of building drawing.

SGHH1052 - Principles of Economics
This course provides the basic elements of economics. It introduces to the student the basic economic principles such as the theory of firms and market organizations. This is 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 aspect of macroeconomic topics are also covered in this course.

SGHH1063 - 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 by 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 that are used in the selection of investment opportunities.

SGHH1073 - Surveying and Computation
The course includes Administration of surveying: Jabatan Ukur dan Pemetaan (JUPEM), Land Office etc.; Land record system: Freehold, lease, TOL, ; Types of plan: Local plan, standard sheet, admit plan, topography plan; Measurement: Distance, with, volume; Practical: Survey instrument, procedures to measure site and building, designation of location plan, site array and building; Plan reading, interpretation and reproduction.

SGHH1083 - Town and Country Planning
This course is designed to give an understanding, knowledge and exposure on concepts, principles and systems of town and country planning in Malaysia. The content includes 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 the plan making process. The students will also be exposed to the planning control system and the tools used to control the real estate development process.

SGHH1093 - Contract, Agency and Tort Law
This course will explain and discuss the principles of law relating to contract, agency and torts which are applicable in property transactions. 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.

SGHH2102 - Computer Application in Real Estate
The course aims to impart knowledge on the use of computers in real estate. It comprises both the theoretical and practical aspects of computer applications for real estate. For the theoretical part, students will be introduced to the basic aspects of computer application. This focuses on commonly used software in real estate. The types of software include spreadsheets, database management systems (DBMS) and statistical packages. For the practical part, students will be given hands-on exercises on several computer programmes as mentioned. The course is expected to provide basic knowledge and skills for computer applications in real estate.

SGHH2113 - Applied Valuation
The course intends to provide a comprehensive understanding of the various aspects of applied valuation. It concurrently develops theoretical knowledge and practical skills among students and prepare them for practice valuation. The course enables students to apply valuation methods for a wide range of properties, including residential, investment, business and development by taking into account the economic, physical, regulatory and other information. The practical aspect of the course is for students to produce and deliver valuation reports.

SGHH2123 - Property Management
The primary purpose of this course is to provide students with the fundamental knowledge of property management. It also includes the formation and process in property management which leads to the formation of a management plan. This also includes the management method, strategies for property management, principles of adaptability and suitability, support service preparation, and lastly the building maintenance management.

SGHH2133 - Real Estate Law
This course touches upon the law relating to real estates, primarily in accordance with the National Land Code 1965 and the procedures in respect to it. It will address the alienation of land, types of titles and ownership rights on the land, land dealings, registration and restraints on dealings.

SGHH2143 - Land Economics
The primary purpose of this course is to provide students with the fundamentals of land economics that relates to location theory, land value and urban growth. These are then examined in the context of urban land development policies in Malaysia. This course examines the impact to policies on land development and land use in Malaysia. The main discussion focuses on the usage and problems in urban land such as housing, transportation and industry and also the roles of responsible agencies for the land development.

SGHH2152 - 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.

SGHH2163 - Statutory Valuation
This course is designed to give students the knowledge on statutory valuation consisting of valuation for the purpose of property taxation and compensation for compulsory acquisition. This include the legal aspects in property taxation and land acquisition 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 methods and procedures to value and determine the various types of property taxations.

SGHH2173 - Building Law & Regulations
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 are 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.

SGHH2183 - Building Services and Maintenance
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 include the functions, design criteria and different types of building services, and the introduction and aspects in the maintenance of buildings.

SGHH3193 - Environmental Studies
The course intends to provide a comprehensive understanding of environmental issues associated with real estate disciplines. The course can be viewed in three parts. The first part introduces environmental studies, such as the concept of sustainability and environmental policies. The second part of the course focuses on real estate environmental concerns, such as environmental protection during property development, green building, natural resource managements, rural and urban environmental studies. The third part of the course enables students to manage and form environmental strategies. Topics include energy management, Environmental Management System (EMS), creating environmental awareness, life cycle assessment, and design sustainability indicators. At the end of the module, students should be able to identify environmental issues that affect real estate business.

SGHH3203 - 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 is 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 also acquaints students with the fundamentals of marketing knowledge such as market segmentation, marketing strategy and marketing mix which are critical to the agent's success.

SGHH3213 - Valuation of Specialised Properties
The primary purpose of this course is to provide students with effective ways to manage various types of properties including residential, commercial, industrial, agricultural and tourism-related properties. The property management discipline deals with eleven major areas as outlined in the Property Management Standard. Property management integrates theories from other disciplines like: accounting, finance, business administration and strategic management. In addition, the course covers tools and a range of skills that are useful and often required to be applied in the management of properties.

SGHH3259 - Industrial Training - Practical
Students are placed in practical training centres at various government and private agencies throughout Malaysia and abroad. They are exposed to practical aspects of real estate valuation and management. The details of industrial training are included in the Rule Book published by the Faculty.

SGHH3263 - Industrial Training - Seminar
This course exposes students to the real situations of the profession. Students are placed at various government and private agencies within or outside Malaysia. They are exposed to all aspects of real estate valuation and management. Students are required to do a presentation on the related topics and to submit individual reports to be evaluated by the panel appointed by the department. The details of industrial training are included in the Rule Book published by the Faculty.

SGHH4302 - 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 of Science 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 discipline in real estate. The main aspects of this course that will be taught to the students are problem formulation, setting research objectives, developing theoretical frameworks through literature review, selecting and designing data collection and analysis methods, effective thesis report writing, and presenting the results.

SGHH4314 - 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 emphasis is given to data collection, analysis of data and findings of the study and to eventually produce a report and article writing. Students have to present their research findings.

Elective Courses

SGHH4273 - Business Valuation
The primary purpose of this course is to provide students with the fundamental and practical aspects in undertaking real estate-related business valuation. The discussions are mainly on financial statement analysis and investment returns. Three main valuation methods are discussed, income, cost and market approaches.

SGHH4283 - Professional Practice
This course introduces students to the practice world of real estates, 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 the real estate profession in Malaysia and selected markets. The highlights of the course include differences between professionals and non-professionals, qualifications and requirements to be real estate professionals, code of ethics and standards, professional negligence, setting up of professional business organizations, opportunities and challenges in the field of valuation, estate agency and property management.

SGHH4293 - 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 effect 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 (cash flow construction and sensitivity analysis, risk analysis and return).

SGHH4343 - Property Portfolio Management
Property portfolio management provides students with the fundamentals of Modern Portfolio Theory (MPT) with further discussions on Capital Market Theory (CMT) in relation to real estate investment. These two breakthroughs in financial theory have caused significant impacts to financial analysts and investors in managing their investment assets. The main discussion will be on the questions of what is the best possible investment portfolio? And what is the price of investment assets? The core of this course is the application of MPT and CMT in real estate analysis in relation to capital/financial market conditions.

SGHH4353 - Project Management
The course aims at enabling valuation surveying and property management students to acquire essential aspects of project management particularly a non-complex construction project. The knowledge imparted to students covers areas and practices of project management including 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.

SGHH4363 - GIS in Real Estate
The course aims to impart knowledge about GIS applications in real estate. It consists of both theoretical and practical parts of GIS application. The theoretical part introduces GIS to students. This includes the definitions, components, and functions of GIS. Students are able to relate the theoretical aspects of GIS to real estate knowledge or experiences that they have gained through other subjects. The practical part gives the students an opportunity to learn to use a selected GIS programme. This would enable them to have a hands-on experience of real estate data input, data management, data analysis and data output using GIS. As a whole, this course provides the basic knowledge and experience an undergraduate student of property management would need in order to embark on GIS applications in real estate in future.

SGHH4333 - Facilities Management
This course aims to introduce the facilities management concept and its contributions in achieving organisational objectives. The course covers the main elements relevant to facilities management. It is divided into four parts: The first part sets the scene by bringing in the facilities management concept and explains how it has emerged as a professional discipline. The second part outlines the various competencies that are required to be a facilities manager, and the third part is devoted to the important elements that support facilities management such as value and risk management, and the sustainable concept of managing facilities, while the fourth looks at the types of facilities services that are offered by organisations.

SGHH4383 - International Property Market
This course is an introduction to international property markets, focusing on fundamental aspects that shape different markets in different parts of the world. These aspects include those which are generally similar among different countries, and those which differ because of geographic, cultural, political and administrative boundaries.

SGHH4393 - Computer Assisted Mass Appraisal (CAMA)
This course introduces students to some methods of carrying out mass appraisal, particularly with rating valuations. Students are given the basic concepts of mass appraisal and the various ways valuations are modelled. The course includes topics such as the introduction to mass appraisal, the need for mass appraisal, the technology of mass appraisal, modelling the mass appraisal technique and applying mass appraisal technique in valuation project groups.

SGHH4403 - Cost Estimating and Tendering
This course is designed to introduce students to the principles of building estimating and tendering. It illustrats the broad application of the theory to many estimating and tendering applications. It emphasizes on the procedure of tendering and estimating, the preparation of unit rates and the estimating process for each building trade. At the end of the course, students should be able to understand the factors affecting the tender and perform calculations to estimate each building trade.

General Courses

Introduction

Compulsory general courses for all new students from Ministry of Higher Education (KPT).

Compulsory courses for student all news students	Offering Faculty[1]	Status	Required Credit
Ministry of Education (KPM)		**2**	
UHAK1032 **INTRODUCTION TO ENTREPRENEUSHIP**	CCSL	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

Course Clusters

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

Course Cluster / List of Courses	Offering Faculty[2]	Status	Required Credit
1.0 Appreciation Of Philosophy, Value And History Cluster			**4**
UICI1012 Islamic and Asia Civilizations (**Local)**	FTI	1*	2
UHAS1172 Malaysian Dynamics (**Local)**	FM	1*	2
UHAK1022 Malaysian Studies 3 (**International**)	FM	1*	2
ULAM1112 Malay Language for Communication (**International**)	FM	1*	2

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

2.0 Generic Skills Cluster			4
UHAK1012 Graduate Success Attributes	FM	1*	2
UHAK2XX2 Soft Skills Elektif			
- UHAK2012 Leadership in Organisation	FM	4	2
- UHAK2022 Critical and Creative Thinking	FM	4	2
- UHAK2032 The Human Side of Knowledge Management	FM	4	2
- UHAK2042 Development and Global Issues	FM	4	2
- UHAK2052 Guidance & Counselling	FM	4	2
- UHAK2062 Psychology of Adjustment	FM	4	2
- UHAK2072 Fundamentals of Intellectual Property	FM	4	2
- UHAK2082 Law for Entrepreneurs	FM	4	2
- UHAK2092 Entrepreuship and Enterprise Development	FM	4	2
- UHAK2102 Social Enterpreneurship	FM	4	2
- UHAK2112 Engineering Communication	FM	4	2
- UHAK2122 Human Communication	FM	4	2
- UHAK 2132 Professional Ethics	FM	4	2

Course Cluster / List of Courses	Offering Faculty[3]	Status	Required Credit
3.0 Khowledge Enhancement Cluster			**4**
UICL 2302 The Thought of Sciences and Technology	FTI	1*	2
UICL 2XX2			
- UICL2072 Sustainable Economy	FTI	4	2
- UICL2052 Family Law	FTI	4	2
- UICL2092 Philosophy of Islamic Art	FTI	4	2
- UICL2042 Future Studies	FTI	4	2
- UICL2032 Life Institutions and Sustainable Development	FTI	4	2
- UICL2062 World Science	FTI	4	2
- UICL2082 Al-Quran and Human Civilizations	FTI	4	2
- UICL2102 Islam and Health	FTI	4	2
- UICL2032 Islamic Enterpreneurship	FTI	4	2

Course Cluster / List of Courses	Offering Faculty[4]	Status	Required Credit
4.0 Service Learning Cocurriculum Cluster		**2**	
a) UKQX2XX2 b) UKQE3001 Extracurricular Experiential Learning There are a wide variety of co-curriculum courses available; students are advised to refer to the course descriptions published by the Centre for Co-Curriculm Courses and Service Learning (CCSL)	CCSL	1*	2 1

Course Cluster / List of Courses	Offering Faculty[5]	Status	Required Credit
5.0 Language Skills Cluster			**8**
ULAB1122 Academic English Skills	AB	1*	2
ULAB2122 Advanced Academic English Skills	AB	1*	2
ULAB3162 English for Professional Purpose	AB	1*	2
ULA**X**1112 Foreign Language Elective			
- ULAA1112 Arabic Language I	AB	4	2
- ULAJ1112 Japan Language I	AB	4	2
- ULAC1112 Mandrin Language I	AB	4	2
- ULAF1112 Frances Language I	AB	4	2
- ULAN112 Persian Language	AB	4	

Syllabus Synopses

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

1.0 Appreciation of Philosophy Value and History Cluster

UICI1012 Islamic and Asian Civilisation

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

UHAK1022 Malaysian Studies 3

This course is designed for first year foreign undergraduates. It aims to serve the need of the students to understand and apply the attributes of adaptability and thinking skill. Students will be exposed to various aspects of the Malaysian cultures such as the belief system, religious festivals, customs and etiquette of different racial groups in Malaysia. They will also be introduced to Malaysian traditional music, arts and crafts. It would help students to benefit from the various educational experiences. This would gradually produce students who are able to work across culture.

UHAS1172 Malaysian Dynamics

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

ULAM1112 Malay Language for Communication

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

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2.0 Generic Skills Cluster

UHAK1012 Graduate Success Attributes

This course aims to serve the need of the students to understand and apply the attribute of UTM graduate skills. The course guides students in developing basic communication skills, thinking skills, scholarship skills, teamwork skills, adaptability skills, global citizen skills and enterprise skills to prepare themselves to real world practices. In this course, students will be assessing through debate, case study, group portfolio and projects based learning that requires them to utilize the related skills.

UHAK2012 Leadership in Organisation

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

UHAK2022 Critical and Creative Thinking

This course aims to develop high thinking thinking skills and to develop the curiosity and the energy of knowledge, as well as to solve a problem that is creatively and innovative in a new situation. These skills are developed through activities such as scenario studies, role-play, debates and group assignments.

UHAK2032 The Human Side of Knowledge Management

The goal of the course is to prepare students to become familiar with the current Knowledge Management (KM) practices, and the importance of knowledge as a resource in knowledge-based economy. In this course, all students need to acknowledge both the soft and hard perspectives of KM. The course guides students in developing scholarship skills, adaptability skills, thinking skills and communication skills to prepare themselves to real organizational practices. In this course, students will be assessing through article reviews, case study, group debate, case study and project based-learning that require them to utilize the related skills.

UHAK2042 Development and Global Issue

This course aims to serve the need of the students to understand and apply the attributes of adaptability and global citizenship. This course emphasizes the political, economic, social and cultural interdependency and interconnectedness between the local, the national and the global. In this course, students will be expected to participate in class activities and projects based learning (PBL) that require them to utilize the related skills. It would engage students to find solutions to various problems and situations that exist in the society. It would help students to be an empowered global citizen benefitted from the various educational experiences. This would gradually build the dispositions that produce agency, to reason ethically and professionally.

UHAK2052 Guidance & Counselling

This course aims to introduce the students to the basic of counselling and guidance to help people. Students will obtain the knowledge and skills of basic of counselling which will provide them an adaptive added value through the activities in class, case study and group work assessment.

UHAK2062 Psychology of Adjustment

This course aims to develop self-adjustment in dealing with contemporary challenges in everyday life. This course addresses psychological approaches to understanding, managing, and changing our physical and emotional well-being. Relationships with others, our environment(s), and ourselves will be explored and examined. Upon completion; students should be able to demonstrate an awareness of the processes of adjustment. The desired outcome is for students to adapt this knowledge to actively take charge of their own lives, creatively adjusting to an ever-changing world.

UHAK2072 Fundamentals of Intellectual Property

This course introduces the concept of various Intellectual Properties comprising of copyright, trademarks, patents, industrial designs, trade secrets and its associated rights. At the end of the program, student will be able to adapt the requirement of IP in developing IP products for commercialisation. This course will also enhance students' thinking skills and adaptability skills which will help them to function effectively in their professional career.

UHAK2082 Law for Entrepreneurs

This course aims to provide students with a general overview of what entrepreneurs should know pertaining to the business legal environment in Malaysia. The main objectives are to equip students with the necessary knowledge and skills to start their business ventures and address the arising challenges and liabilities. This course will also enhance students' thinking skills and adaptability skills which will help them to function effectively in their professional career.

UHAK2092 Entrepreuship and Enterprise Development

This course introduces the concepts and principles of entrepreneurship and the process of starting a business venture. A three-stage approach is used to achieve the course learning outcome: (a) understanding the individual characteristics of an entrepreneur, (b) analysing business opportunities and forming an entrepreneurial venture, and (c) developing a business model for the new venture idea. During the first stage, students will be exposed to the concepts and principles of entrepreneurship and individual characteristics and the required skills to successfully manage business ventures. Then, they will be introduced to techniques and tools to analyse and assess business ideas and the procedures to set up business ventures in Malaysia. Finally, they will be guided through every stages of business model development using their business ideas as case study. In addition to guided T&L, students will also be exposed to real life entrepreneurial activities through entrepreneurship carnivals containing talks by successful entrepreneurs, entrepreneurial workshops and entrepreneurial activities.

UHAK2102 Social Enterpreneurship

The course gives a thorough understanding of the field of social entrepreneurship, by a mixture of lectures concerning the entrepreneurial principles which allows students to manage a venture to achieve a social change. This course also encourage students to engage with real social entrepreneurs through assignments and practical work .From this course the student will gain a broad theoretical and practical knowledge about social entrepreneurship. The emphasis will be the fulfilling the needs and obligations of social responsibility for building a sustainable society. They will know how social entrepreneurs work, what kind of challenges they face, and how these challenges can be met.

UHAK2112 Engineering Communication

The aim of this course is to develop students competency in communication related to engineers workplace. For that purpose we expose the basic skills in communication of taking students through the basic process in communication. The content of this course include a communication skills related to technical field such as interpersonal skills for engineers, writing skills, instructional skills, supervisory communication for engineers negotiation and consultation skills.

UHAK2122 Human Communication

The aim of this course is to develop students communication competency practice inhuman and work life. For that purpose we expose the basic skills in communication of taking students through the basic process in communication theoretically and practically. The content of this course include a communication skills related to human life and work life such as interpersonal skills, group communication, public communication and intercultural communication.

UHAK 2132 Professional Ethics Entrepreneurship

This subject focus on guiding future professionals to understand, aware, appreciate and practices professional work ethics in daily life not only in local context but also involving in global context. Attributes as a global citizen, future professional able to adopt an ethical attitude and approach when they develop, promote and implement professional conduct when anticipating in professional activities. Discussions will cover fundamental questions about ethics (moral), theories of ethics; fundamental ethical values, ethical awareness; principles and ethics function; ethical issues in the profession; the obligation to provide services; obligations toward clients; deep analyses ethical issues in various fields such as science, management; medical; engineering, law, education and business.

3.0 Knowledge Enhancement Cluster

UICL 2302 The Thought of Sciences And Technology

This course is designed to expose the students about creating life institutions founded on sustainable development. The scope of the discussion covers various aspects and systems in human life. It includes a happy family institution, harmonious social institutions, continuous and effective educational institutions, established economic institutions, fair legal institutions, authoritative political institutions and sustainable development. Discussions ranging from policy matters will build a paradigm that is capable of resolving relevant current issues for application in life.

UICL2072 Sustainable Economy

This course is designed to develop thinking skills, scholarships, and adaptability. All the skills are designed through the assigned tasks. Thinking skills on the economic system are measured through tests and assignments. While scholarships on the concepts and systems of Islamic economics and their differences with conventional economic systems are measured through tests and presentations. The adaptability of presenting the sustainability of Islamic economic institutions in the context of modern society life is measured through assignments and presentations.

UICL2052 Family Law

This course describes the basic, characteristic, and scope of Islamic and civilian family law in Malaysia. This course also describes the concepts in family law on marriage, divorce, affiliation, adoptions, childcare, child custody, and property division, inheritance, parental religious exchange issues and inheritance distributions issues. The study is conducted through lectures, discussions, assignments presentations, related case searches and presentation of specific case reports. At the end of the lesson, students are aware of the differences between Islamic family law and civil law enforcement and their implementation in Malaysia. Finally, this course explains relevant legal applications to resolve family law issues in Malaysia.

UICL2092 Philosophy of Islamic Art

This course discusses the philosophy, concepts, principles and goals of art, historical analysis and development of Islamic art. This course also discusses the differences between the philosophy of Islamic and Western arts, Islamic art in the Malay world and contemporary Islamic art. The aspects of Islamic art include architecture, sound art and fine art are also touched. Also discussed are the figures of Islamic art, the role and contribution of Islamic art to the world civilization as well as the application of the arts in Muslim life.

UICL2042 Future Studies

This course is designed to build expertise, thinking skills, and global citizens. All skills are constructed through specified learning and assignment activities. The expertise skills are measured through tests and final exams regarding the expectations of western and eastern thinkers about what will happen especially in the aspects of civilization and achievement in the fields of science and technology, the development of knowledge, the continuation and change of paradigm of thought in the West and East, covering the classical period to modern post. Furthermore, thinking skills and global citizens are measured through group assignments and presentations related to the signs of ending the nature and expectations of its destruction that are addressed by the Quran and hadith as comparative material, as well as solutions related to future studies.

UICL2032 Life Institutions and Sustainable Development

This course is designed to expose students to building life institutions founded on sustainable development. The scope of the discussion covers various aspects and systems in human life. It includes happy family institution, harmonious social institutions, continuous and effective educational institutions, established economic institutions, fair legal institutions, authoritative political institutions and sustainable development. Discussions is based on policy matters will create a paradigm which will be able to solve relevant current issues for application in life.

UICL2062 World Science

This course is designed to build expertise, thinking skills, and global citizens. All skills are constructed through specified learning and assignment activities. Expertise are measured through tests and final exams relating to world science in the context of thought and achievement in various fields. Students are guided in order to have the of thinking in responding to various fields covering agriculture, municipalities, textiles, standards measurements, transport systems, human rights, discussion and democracy, innovation, mathematics, biology, physics, chemistry, medicine, astronomy, engineering, literature, and art. Next, thinking skills and global citizens are measured through group assignments and presentations on sustainability and synergy between world science since early civilization and today.

UICL2082 Practice and Concept of Halal Management

This course is designed to build thinking skills, expertise and global citizens. All skills are built through the learning and assignment activities designed. Expertise skills are measured through final tests and examinations related to halal basic concepts, halal and illegal principles in Islam, halal applications in the industry, entrepreneurship prospects in halal industry, law, halal monitoring and enforcement and halal certification of Malaysia. Next is thinking skills and global citizens are measured through group assignments and presentations on issues around the halal industry comprising food and beverage, restaurants and food premises, slaughtering, logistics, pharmaceuticals and cosmetics to provide understanding and applying attributes for UTM graduates' skills.

UICL2012 Al-Quran and Human Civilization

This course is designed to build the expertise, thinking skills to produce global citizens. All the skills are built through the learning activities designed. Expertise and thinking skills are measured through tests, examinations and group assignments related to the introduction of the Qur'an; The Quran as a source of civilization from a political, economic and social perspective. Global citizenship skills are achieved through discussions on the progress of the various fields of civilization of the prophets and the previous people as well as case studies on the comparative story of the cultural and facade culture found in the Qur'an. Students have the opportunity to present the knowledge and skills learned to classmates through presentations and questionnaires.

UICL2102 Islam And Health

This course is designed to build expertise, thinking skills and global citizens. All the skills are built through the assigned tasks. Expertise are measured through tests and final exams regarding health concepts; human and health, healthy and ill in spiritual and physical aspects; general themes and methods in the process of maintaining health, prevention and treatment. Furthermore, thinking skills and global citizens are measured through group assignments and presentations on disease classification, general principles of treatment and treatment; Application of health and treatment practices; Health care therapies, nutrition rules, disease treatments, medication taking, scientific evidence of illness and treatment; Biopsychosocial-spiritual as a disease treatment approach.

UICL2032 Islamic Enterpreneuship

This course is designed to build thinking skills, expertise, entrepreneurship, and adaptability. The skills are built through the assigned tasks. Thinking skills on the concept of Islamic entrepreneurship and entrepreneurial paradigms based on Islamic perspectives are measured through tests. Meanwhile, scholarship on entrepreneurial values, attitudes and motivation is measured through tests and presentations. Next, entrepreneurial skills on basic concepts in Islamic business and business contracts are measured through tests, assignments, presentations, and projects in groups. Finally, the adaptability of alternative solutions to current issues in the world of entrepreneurship is measured through assignments, projects and presentations.

4.0 Service Learning Cocurriculum Cluster

There are a wide variety of co-curriculum courses available; students are advised to refer to the course descriptions published by the Centre for Co-Curriculm Courses and Service Learning (CCSL), Office of Undergraduate Studies (UGS).

5.0 Language Skills Cluster

ULAB1122 Academic English Skills

This course emphasises the four language skills. It focuses on developing students' productive and receptive skills through student-centred activities in academic situations. This includes reading academic texts, listening for main ideas and details, taking notes, writing clearly and coherently, and participating in oral presentation and class discussions. Additionally, enrichment grammar activities are also incorporated to integrate the skills and knowledge. At the end of this course, students should be able to use the English language in daily and academic activities.

ULAB2122 Advanced Academic English Skills (prerequisite ULAB1122)

This course reinforces and enhances all four key language skills to facilitate students' language acquisition in academic situations. This includes reading and synthesising information, listening for main ideas and details (e.g. lectures and excerpts), taking notes, writing clearly and coherently, and participating in oral presentation and class discussions. The course also incorporates key vocabulary items and grammar. In addition, the course fosters independent learning activities facilitated by online resources. At the end of the course students should be able to integrate skills and knowledge to perform tasks in academic contexts.

ULAB3162 English for Professional Purposes (prerequisite ULAB2122)

This course prepares students with the skills of effective communication necessary for them to be employable upon graduation. At the beginning of the course, students are required to do enculturation tasks in order to discover their potentials and possible expectations of the prospective working culture. Through active learning, it emphasises oral and written communication skills that are practiced in workplace situation. Using authentic workplace scenarios in the form of case studies, students will be given opportunities to negotiate and present information through group discussions and presentations. By the end of the course, students should be able to function as individuals and team members using appropriate communication skills at the workplace.

ULAC2112 Basic Mandarin

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

ULAF1112 French Language

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

ULAJ1112 Japanese Language I

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

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.

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 it 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/

Programme and Course Registration

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

Program Registration

1. Students MUST register for the program offered on the date stated by the university.
2. Students who do not abide by (1) above without a valid reason accepted by the university, the offer for program admission will be automatically withdrawn.
3. Automatic registration for the program will be done by the university administration for senior students based on the previous semester examination results.
4. Senior students with deferred status or are suspended must re-register for the program. If the students do not register for the program within the time given, the study will be terminated.
5. Students who have not registered for the programme are not allowed to register for courses.

Course Registration

1. Students who have registered for a programme for the academic session MUST register for all the courses to be taken in that semester.
2. Students can only register for the courses offered in a semester according to the terms and conditions set by the student's faculty. Students cannot register for courses that are not offered in the semester.
3. Every course taken in the semester must be registered correctly by stating the course code, section number, number of course credits and the status such as Replacement Course (RC)[UM], Replacement Grade (RG)[UG], Audit Course (AC)[HS], Compulsory Audit Course (CAC)[HW] or Minor Course (MC)[MN].
4. Mistakes made during registration of a course may result in students be given zero (0) mark for the course.
5. Any course repeated by a student (except for students who are Re-admission (RA) [DS] must be registered as Replacement Course (RC)[UM] or Replacement Grade (RG) [UG]. The course will be classified as follows:
   i Replacement Course (RC)[UM] is a repeat of a failed course from the previous semester;
   ii Replacement Grade (RG)[UG] is a repeat of a passed course with (grade B- and below) aimed at improving the academic performance and with the permission of the faculty. A fee of RM 50.00 will be charged for every credit and refunds will not be given if the student withdraws from the course.
6. The previous course code must be used for registration purposes as in paragraph 5.0.
7. Courses taken by Re-admission (RA)[DS] students cannot be registered as Replacement Course (RC)[UM] or Replacement Grade (RG)[UG].
8. Course Registration can be done either online or using the Course Registration Form (Form UTM.E/3.1 Amendment 2010). Students are advised to discuss with their Academic Advisors before registering for the courses.
9. Students are encouraged to pre-register their courses by using either the online or other facilities within the registration period given by the university.

10. Compulsory course registration will be conducted over a period of two (2) working days during the last week before the semester begins according to the date determined by the university. Registration after this period is restricted to the last working day of the first week6 of the semester and will include a fine of RM50.00. Course registration after this period of time will not be allowed unless permission is obtained from the faculty.
11. Students may make amendments to the previous registration during the first week of the semester. Any changes in the registration made in the second week will incur a fine of RM50.00 per course up to a maximum of RM300.00. The amendments include insertion, deletion, changes of code and status of courses by using the Registration Slip Amendment Form (Borang UTM.E/3.5 Pindaan 2010).
12. Students should print the course registration slip and check to ensure that the information on the slip is accurate. Students should make the necessary amendments based on the rules, conditions and time given as stated in paragraphs 10 and 11.
13. The official registration slip will be issued to every student by the faculty in week ELEVEN (11). Students should obtain the slip from their faculty and bring it with them when they sit for their final examinations.
14. Students may withdraw (CW)[TD] from any of the courses registered in the semester. The application to withdraw (CW)[TD] is by using the Course Withdrawal Form (Form UTM.E/3.2 Amendment 2010) beginning week THREE (3) until the last working day of week NINE (9) in the semester. Request for withdrawals after this date will not be allowed.
15. The course registration process shall be done according to the procedures set by the university. Registrations which are not done according to the procedures will be rejected or not be considered.
16. If a student fails to register for the course within the time stipulated unless valid reasons are presented and accepted by the university, the student's study will be terminated.

[6] Please refer to the academic calendar at www.utm.my/academic/calendar/

Grading and Point Value System

Grading System

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

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

The passing grade for any course is set by the Faculty upon the Senate's approval. Generally, the minimum passing grade, **except for studio courses**, is D+. The minimum passing grade for studio courses in the Architecture, 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 course registered with a HW status are without grades. For these courses, students will obtain a 'HL' (Pass) or 'HG' (Fail) status. Compulsory audit course earn credit toward a degree but not grade points.

Academic Standing

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

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

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

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

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

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

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

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

GPA/CGPA Computation

The method of computing the GPA in one particular semester with 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.

Special Programmes for Undergraduates

UTM Professional Skills Certificate

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

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

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

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

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 http://www.utmspace.edu.my/utmpp/ and http://languageacademy.utm.my/tests-info/tecs

Cross-Campus Programmes

Purpose

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

Universities Involved

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

Funding

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

1. Students will pay fees at the initial university and will not be charged at the host university.
2. The host university must provide accommodation facilities on campus for students from other universities.
3. Students involved are permitted to use health services at the host university like those provided to other students.
4. All other costs will be borne by the students. However, as an incentive, each university might want to consider monetary assistance to those students involved.

Student Selection and Programme Implementation

Student selection criteria are as follows:-

1. This programme is opened to registered students at the First Degree level who have completed at least two (2) semesters of studies.
2. Students are not resident of/do not originate from the state in which the host university resides.
3. Students must obtain a minimum CGPA of 3.00 at the time of application. The total credit allowed to be taken is between 12 and 16 credits only. Implementation of the programme is during Semester II of each academic session.
4. Students selected will participate in the programme for one semester and students must return to their respective universities after the said studies.

UTM Global Outreach Programme

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

Through the UTM Global Outreach programme students are able to:

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

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

The UTM Global Outreach Programme is coordinated by the faculty in collaboration with UTM International. Consult the respective academic coordinator for more information on this programme.

UNDERGRADUATE ACADEMIC GUIDEBOOK

Faculty of Built Environment and Surveying