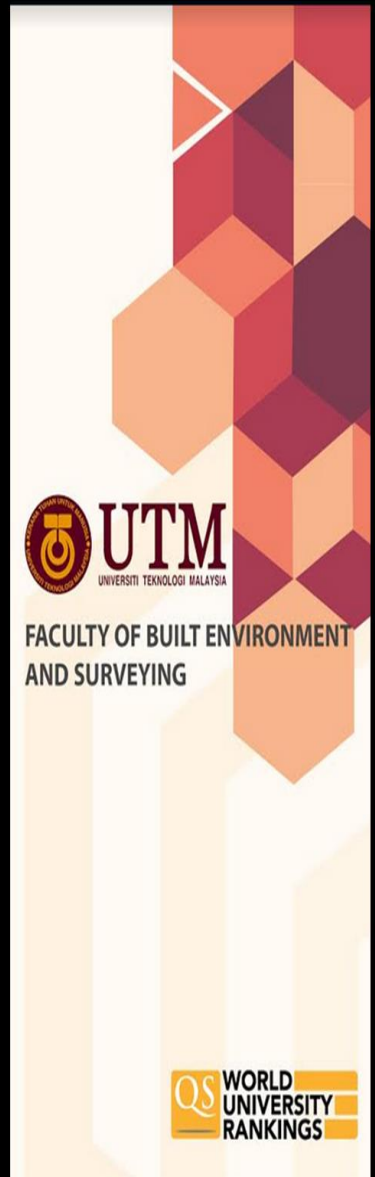


2019/2020

# POSTGRADUATE ACADEMIC GUIDEBOOK



**FACULTY BUILT ENVIRONMENT AND SURVEYING**

**POSTGRADUATE  
ACADEMIC GUIDEBOOK**  
Academic Year 2019/2020

**Faculty of Built Environment and Surveying**  
Universiti Teknologi Malaysia

[builtsurvey.utm.my](http://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, Theme and Core Values

## *Vision*

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

## *Mission*

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

## *Theme*

Professional Built Environment Education for Sustainable Development

## *Core Values*

Creative | Progressive | Collaborative | Inclusive | Sensitive

## 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](http://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 Ts 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.

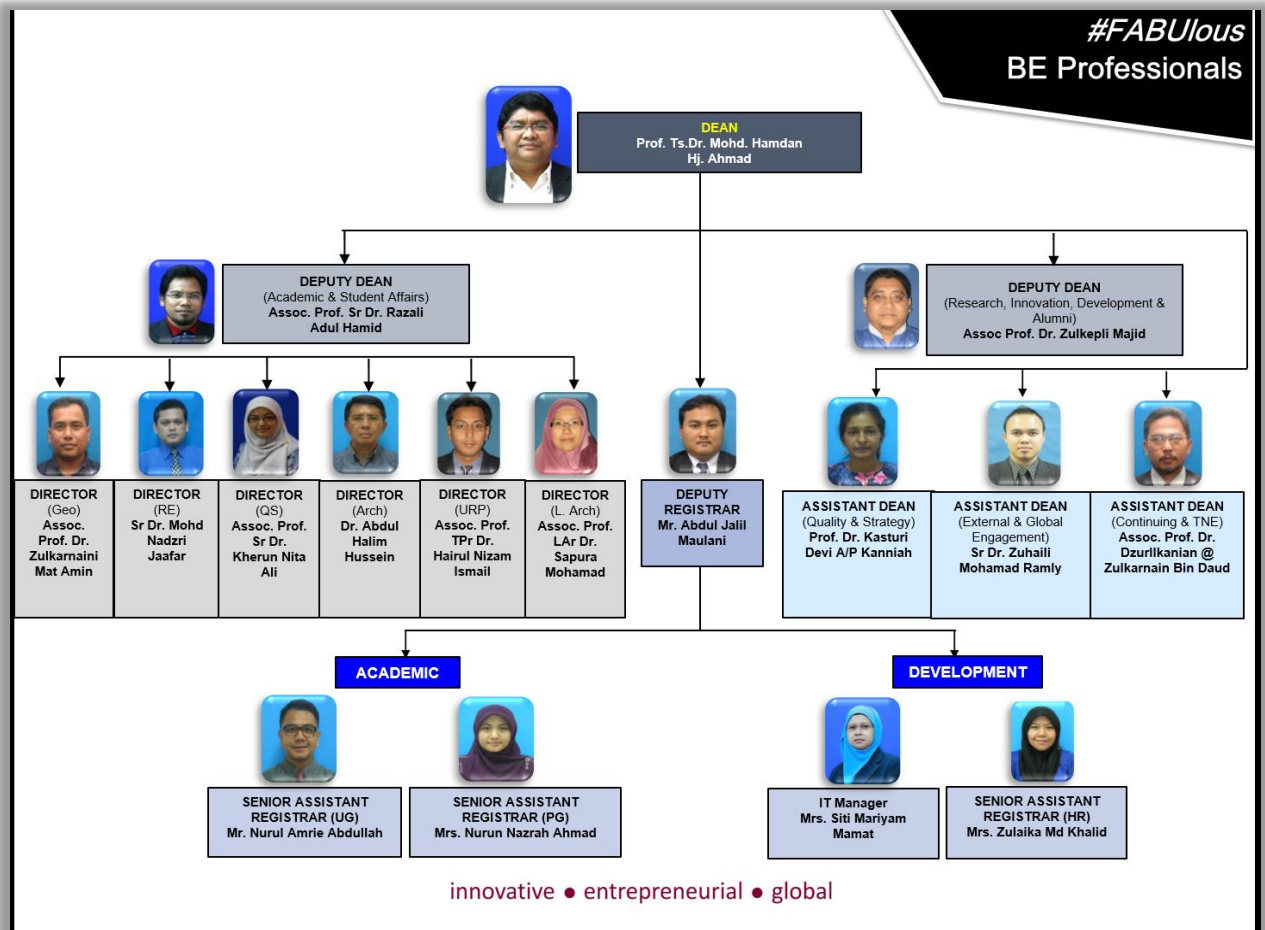
The undergraduate programmes are designed to provide a firm academic base and professional expertise in the respective disciplines. The Faculty uses its strong industry links to focus on current topics, skills in demand now and in the future. Students are encouraged to undertake real-world projects and 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.



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### Organisational Structure



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## POSTGRADUATE PROGRAMMES

### Master Programmes

The master programmes at the faculty are offered in both taught course and research modes.

Master programmes in taught course mode are:

- Master of Architecture
- Master of Science (Construction Contract Management)
- Master of Science (Urban & Regional Planning)
- Master of Science (Transportation Planning)
- Master of Science (Tourism Planning)
- Master of Science (Geomatic Engineering)
- Master of Science (Geoinformatic)
- Master of Science (Remote Sensing)
- Master of Science (Land Administration and Development)
- Master of Science (Real Estate)
- Master of Science (Asset and Facilities Management)

Master programmes in research mode is:

Master of Philosophy

Specialisations:

- Architecture
- Quantity Surveying
- Urban & Regional Planning
- Transport Planning
- Landscape Architecture
- Geomatic Engineering
- Geoinformatics



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- Remote Sensing
- Satellite Surveying
- Satellite Navigation
- Industrial Surveying
- Hydrography
- Real Estate
- Land Administration and Development
- Facilities Management



## Master of Architecture

### Introduction

The Master of Architecture Program is a professional degree equivalent to the professional qualification of the Board of Architects Malaysia Part II. It is a continuation of the Board of Architects Malaysia Part I, which is addressed in the Bachelor of Science in Architecture program in UTM. The program is a taught course Master Program and as such there is a structured curriculum with an emphasis on more research-based architectural design studio projects. This focus enables a more intellectual and theoretical basis in the architectural projects addressed within the program at the same time contribute to the development of architecture within the National framework; that emphasises on the sustainable development. The focus on research-based is an addition to the technical, scientific and technological considerations that are already embedded in the courses. The Master of Architecture program is recognised by the Board of Architects Malaysia (LAM), Malaysian Institute of Architects (PAM) and the Public Services Department (JPA). The architecture program in UTM is the first in the country acknowledged by PAM and LAM. The preceding 3 years Bachelor of Science in Architecture is accredited for LAM Part I, and this 2 years Master of Architecture is accredited for Part II.

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

### Name of Award

Master of Architecture [M. Arch.]

### Programme Educational Objectives

- PEO1 Knowledgeable and competent in line with the professional qualification of Board of Architect Malaysia Part II.
- PEO2 Scholarly in research and solve problems critically, analytically and creatively based on scientific facts and sound ideas.
- PEO3 Professional, ethical, responsible and responsive to the values of humanity and sustainability.
- PEO4 Proficient in communication and contribute to working teams as well as competitive in various local and global market.

### Programme Learning Outcomes

- PO1 Generate and integrate knowledge of human behavior, history and cultural context, environment and technology, management in practice and law in relation to the principles and know-how of design in the architectural and construction industry.
- PO2 Formulate research skills in a scholarly manner by integrating knowledge in design, communication, technology, environment, culture and practice.



- PO3 Identify, formulate and provide creative, innovative and effective solutions to architectural problems.
- PO4 Commit professionally and ethically in executing tasks and projects to protect the environment and society in line with the architect's code of conduct.
- PO5 Communicate and defend architectural design solutions effectively through appropriate architectural communication media with architects, other professionals and community.
- PO6 Recognize the need for, and to engage in life-long learning and professional development.
- PO7 Function individually or in teams, effectively, with the capability to be a leader.
- PO8 Realize and demonstrate effective leadership responsibilities.
- PO9 Self -motivate and enhance managerial and entrepreneurship skills for career development.

## Mode and Duration of Study

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

## Classification of Courses

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

Classification	Course Group	Credits	Total credit hours	Percentage
1. Programme Core	A. Design + Communication	33	42	70
	B. Technology & Environment	3		
	C. Cultural Context	6		
	D. Management Practice & Law	6		
	E. Dissertation	3		
2. Elective Courses	F. Elective Courses	3	12	20
1. General Courses	G. General Courses	6	6	10
Total credit hours to graduate			60	100

## Award Requirements

To be eligible to graduate from this programme, students must complete a total of 60 credit hours, accumulated from courses that are set according to the classification scheme shown above, with a minimum CGPA of 3.0 and have completed all the relevant courses within the time allowed.

## List of Courses According to Semester

The students are assigned to a specific grouping before the registration of courses. Each student is required to register all the courses within the same grouping, except the elective courses (marked with \*) that need to be chosen only one (3 credit) from the elective groupings. The students can only register to a maximum of 18 credits only depending to each semester requirement.

### Grouping 1

Courses	Course Group	Prerequisite	Credit	Total Credit
1. MBEA 1116 Design Pre-thesis1	A		6	18
2. MBEA 1303 Research Methodology	A		3	
3. MBEA 1213 Socio Culture	C		3	
4. MBEA 1XX3 / 2XX3 Elective (see list of elective courses)*	F		3	
5. UICW 6023 Philosophy Science and Civilisation	G		3	

### Grouping 2

Courses	Course Group	Prerequisite	Credit	Total Credit
1. MBEA 1126 Design Pre-thesis 2	A		6	15
2. MBEA 1323 Architectural Writing and Publication	A	MBEA 1303	3	
3. MBEA 1223 Urbanism	C		3	
4. UHAZ 6123 Malaysian Society and Culture	G		3	

### Grouping 3

Courses	Course Group	Prerequisite	Credit	Total Credit
1. MBEA 1136 Design Pre-thesis 3	A		6	15
2. MBEA 2333 Dissertation	E	MBEA 1323	3	
3. MBEA 1233 Sustainable Technologies	B		3	
4. MBEA 1413 Contract and Law	D		3	

### Grouping 4

Courses	Course Group	Prerequisite	Credit	Total Credit
1.MBEA 2149 Design Thesis	A	MBEA 1116 MBEA 1126 MBEA 1136	9	12
2. MBEA 2423 Professional Practice	D		3	

## List of Elective Courses

Courses	Course Group	Prerequisite	Credit	Total Credit
1.MBEA 1513 Space Syntax <sup>1</sup>	F		3	33
2.MBEA 2653 Outreach <sup>1</sup>	F		3	
3.MBEA 1523 Advanced Architectural Computing <sup>1</sup>	F		3	
4.MBEA 1563 Green Building Design <sup>1</sup>	F		3	
5.MBEA1573 Architecture and Human Behaviour <sup>1</sup>	F		3	
6.MBEA 1533 Measured Drawing <sup>1</sup>	F		3	
7.MBEA 1553 Advance Arch Tech & Construction <sup>1</sup>	F		3	
8.MBEA 1543 CADD & BIM <sup>1</sup>	F		3	
9.MBEA 1583 Current Issues in Architectural Practice <sup>1</sup>	F		3	
10.MBEA 2613 Competition <sup>1</sup>	F		3	
11.MBEA 2633 Management <sup>1</sup>	F		3	

<sup>1</sup>Students need to choose only one (1) course.

## Syllabus Synopsis

### MBEA 1116 Design Pre-Thesis 1

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

### **MBEA1303 Research Methodology**

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

### **MBEA1213 Social Culture**

This course provides a unique opportunity for the students to pursue a wide range of issues, including (but not limited to) community, neighbourhood, cultural, heritage, gender, religious, psychological, regionalism, conservation and so on. This course is a companion subject for Design Pre-Thesis 1 which is an advanced level architectural design studio that focuses on the Socio-Cultural theme.

### **MBEA 1553 Advanced Architectural Technology & Construction**

The course gives emphasis on human comfort and energy saving concepts and criteria in architecture design. It considers specific aspects of building performance in relation to its context, concepts and techniques needed in the environmental design. Building Information Modelling (BIM) is an integrated process, which foresees a holistic integrated working experience of total building performance. BIM tools are used to analyse the environmental performance of the building.

### **MBEA1126 Design Pre-Thesis 2**

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

### **MBEA 1323 Architectural Writing and Publication**

The purpose of this course is to pursue a strong academic rigor in the students in exploring and researching deeper into a topic of interest of their choosing. Through this course the students will be able to venture into an architectural issue without having to explicitly produce an architectural solution, although still producing a thorough and meticulous exploration of its potential solutions.

### **MBEA 1223 Urbanism**

This course provides a unique opportunity for the students to pursue a wide range of issues, including (but not limited to) urban conservation, sustainable urbanism, future cities, smart cities, space syntax, resilient cities, urban economic issues, eco-urbanisms and so on. This course is a companion subject for Design Pre-Thesis 2 which is an advanced level architectural design studio that focuses on the Urbanism theme.

### **MBEA 1336 Design Pre-Thesis 3**

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

### **MBEA 2333 Dissertation**

Dissertation Is a major academic writing exercise in the Masters Programme. The purpose of this course is to pursue a strong academic rigor in the students in exploring and researching deeper into a topic of interest of their choosing. Through this course the students will be able to venture into an architectural issue without having to explicitly produce an architectural solution, although still producing a thorough and meticulous exploration of its potential solutions.

### **MBEA 1233 Sustainable Technologies**

This course gives emphasis on human comfort and energy-saving concept and criteria in sustainable building design. It considers specific aspects of building performance in relation to its context, concepts and techniques in environmental design. The scope of architectural solutions may be passive or mechanical that illustrates climatic understanding and use of appropriate technological solutions with particular emphasis on tropical climate. This course is a companion subject for Design Pre-Thesis 3 which is an advanced level architectural design studio that focuses on the Sustainable Technologies theme.

### **MBEA 1413 Contract and Law**

This course engages the students in a wide-spanning discourse regarding the practice of architecture in Malaysia. It covers aspects from architectural practice, contract, law, economics, as well as procurements and so on, divided into three main segments. This involve the roles and responsibilities of an architect, their obligations and professional ethics and conduct; principles of law established in Malaysia such as the Architect's Act, Architects Rule, Uniform Building By-law and other By-laws related to the building industry and architectural practice. This course also introduces the economics side of the practice covering feasibility studies, project cash flow analysis, building economics, procurements and matters involving tender and contracts.

### **MBEA 2149 Design Thesis**

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

### **MBEA 2423 Professional Practice**

This course prepares the students in tackling the real-world aspect of design and architectural practice. The series of workshops allows them to focus and address issues regarding their proposed theoretical design and provide realistic

solutions worthy of being constructed, particularly on Feasibility Studies, Fire Regulations and Building and Planning Regulations. Interlaced in between the workshop are series of discussion and sharing session designed to expose students to contemporary professional architectural practice in Malaysia. The students are required to register with Lembaga Arkitek Malaysia (LAM) and Pertubuhan Arkitek Malaysia (PAM) as well. At the end of this course, the students are expected to be able to hit the ground running upon graduation and get themselves on the path to sit for LAM Part 3 as soon as possible.

### **MBEA 1513 Space Syntax**

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

### **MBEA1573 Architecture and Human Behaviour**

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

### **MBEA 1533 Measured Drawing**

This course provides knowledge on heritage with which we can interact and adapt. Some buildings have specific historic context and must be meticulously and exactly preserved. Most buildings, however, must be lived in, interacted with and maintained by the public. These buildings change with us, thus recording a piece of each generation's story. We have an obligation to respect this community resource and preserve it for future generations.

### **MBEA 1523 Advanced Architectural Computing**

This course exposes students to the specialized realm of architectural computing, generative design, parametric modelling and the virtual environment. Existing knowledge of software like Revit and Rhino 3D is essential to form the basis for more advanced rule-based modelling. Revit will be paired with Dynamo, while Rhino 3D will be paired with Grasshopper.

### **MBEA 1543 CADD & BIM**

This course coaches the students on Building Information Modelling (BIM) and current practices in the industry. The students will be exposed to BIM software and processes to assist them in design production and understanding the intricacies of the building construction and technologies. Students will focus on BIM Authoring and Simulation capabilities to produce justifiable designs according to specific needs. The programme also allows students produce more effective building technical and presentations.



### **MBEA 2653 Outreach**

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

### **MBEA 1523 Advanced Architectural Technology & Construction**

The course integrates innovatively the structure, services, current technology, building specifications and their influence on building economy. It is taught as a subject with the main intention of putting into perspective the actual dealings of building requirements when they are put together. This course emphasises integrated design process to create innovative and optimised solutions. A varied range of advanced construction building systems, industrialised building systems (IBS), building information modelling (BIM), green building technologies, intelligent building components and their applications in building design is elaborated. The students will adapt the knowledge on advanced architectural technology and construction into case studies and final design project.

### **MBEA 1563 Green Building Design**

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

### **MBEA 1583 Current Issues in Architectural Practice**

This course expands the students' exposure towards architectural practice by examining issues, problems and developments in Malaysia. Students will be presented with real-world cases and are expected to explore, discuss and argue from multiple perspectives. The course prepares the students to be more aware of the current practices and equip them to better respond to future issues, changes and potential problems. Students are encouraged to register with PAM and LAM, and participate in events organized or sanctioned by them throughout this course.

### **MBEA 2613 Competition**

In this course students will gear themselves to participate in international architectural design competitions, while being coached and tutored by experts in the field via supervisory assignment. Priority will be given to international architectural design competition, but international non-design competitions or local design competitions (or equivalent) can also be considered.

### **MBEA 2633 Management**

This course is an open ended course that provides a platform for students to systematically organize an event and acquire relevant input, guidance and coaching in order to execute the successfully. Students will organize themselves in appropriately sized groups to execute certain tasks as part of the programme for the event. These tasks could consist of sections or segments of a large event such as graphic, media, and advertising department of a national-level conference, sponsorship acquisition department, programme organization and execution and so on.

## Master of Science (Urban and Regional Planning)

### Introduction

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

### Name of Award

Master of Science (Urban and Regional Planning)

### Programme Educational Objectives

- PEO1 Demonstrate an understanding of the complex theories and principles of urban and regional planning as well as the scope and role of planning in the management of growth and change;
- PEO2 Apply a range of analytical skills and techniques that are designed to address a range of complex problems;
- PEO3 Apply the knowledge, skills and understanding to the achievement of feasible solutions to planning problems;
- PEO4 Work in multi-discipline team and contribute to the society.
- PEO5 Comply with ethics, professional and community standards, and involve in life-long learning.

### Programme Learning Outcomes

- PO1 Master key urban and regional planning principles and practice at local and strategic level
- PO2 Adaptability in applying urban planning methods and techniques across a variety of urban planning contexts and practice
- PO3 Relate urban planning ideas and solutions to societal issues in the diverse urban planning practice environment.
- PO4 Undertake research in urban planning and related fields with minimal supervision and adhere to legal, ethical and professional codes of practice.
- PO5 Lead and communicate effectively with peers and stakeholders in facing challenges within the diverse urban planning environment
- PO6 Demonstrate critical thinking and scientific approach to effective management of urban planning issues and challenges
- PO7 Demonstrate competency in managing information required for lifelong learning.



## Mode and Duration of Study

Mode of Study	Full-time
Minimum Duration	1 ½ years
Maximum Duration	4 Years

## Classification of Courses

Classification	Credit Hours	Percentage
1. Programme Core	22	49
2. Programme Electives	12	27
3. Master Project/Dissertation/Thesis	5	11
4. Compulsory University Courses (including Research Methodology)	6	13
<b>Total</b>	<b>45</b>	<b>100</b>

## Award Requirements

For the award of Master of Urban and Regional Planning, the students should achieve a total minimum of 45 credit hours with minimum CGPA of 3.0, including the completion of Research Project.

## List of Courses According to Semester

### Semester 1

Courses	Credit	Total Credit
1. MBEW1015 Land Development Process Studio	5	17
2. MBEW1023 Sustainable Land Use Planning	3	
3. MBEW1033 Contemporary Planning Theory	3	
4. MBEW1043/ Sustainable Transportation Planning/ MBEW1053 Rural Community & Culture	3	
5. MBEW1063 Spatial Analysis Tools (GIS)/ MBEW1073 Planning for Contemporary Social Issues	3	

## Semester 2

Courses	Credit	Total Credit
1. MBEW1085 Planning Workshop	5	17
2. MBEW1093 Methods of Planning Analysis	3	
3. MBEW1103 Urban Governance & Management	3	
4. MBEW1073/ Planning for Contemporary Social Issues/ MBEW1113 Economics and the Environment	3	
5. MBEW1123 University Course – Research Methodology	3	

## Semester 3

Courses	Credit	Total Credit
1. MBEW2135 Research Project	5	11
2. MBEW2143 Negotiation in Planning MBEW1053 Rural community & Culture	3	
3. UXXX xxx3 University Course	3	

## Syllabus Synopsis

### MBEW1015 Land Development Process Studio

The aim of the course is to advance students' knowledge on the substantive and procedural aspects of land development process. It involves the appraisal of the components of land development; development concepts; layout and sustainability principles; and stakeholders' roles in the process. Students develop in-depth understanding of land development process and skills in critically evaluating site suitability, development concepts and layout design principles.

### MBEW1085 Planning Workshop

The aim of the course is to expose students to the process of elucidating solutions to contemporary issues within the local planning context. It involves identification of issues; setting up of analytical framework; conducting appropriate analysis and synthesis of the issues towards formulating planning solutions. A case study approach will be adopted which requires a one week visit to a selected study area.

### **MBEW1093 Methods of Planning Analysis**

The course covers three key areas: population analysis and forecasting techniques relevant for urban-regional scale geographic areas; techniques for regional and local economic analysis such as shift-share analysis, the economic base model, location quotient analysis and input-output analysis; and project evaluation methods.

### **MBEW1023 Sustainable Land Use Planning**

This course educates the students on the concepts and principles of sustainable land use planning. It focuses on effective planning policies and instruments to ensure sustainable urban growth. The students will have the necessary land use analysis and management skills for land use decision making and resolving conflicts between natural and built systems for sustainable land use plans.

### **MBEW1103 Urban Governance and Management**

This course provides students with the understanding of tools of urban governance and management. Urban governance includes pertinent issues and key constitutional concepts within the area of land use law and the essential legal precepts in the administration of land use. Urban management section part of the course highlight current urban issues concerning such as waste management, pollution and infrastructure provision and maintenance.

### **MBEW 1033 Contemporary Planning Theory**

This course provides students with the understanding of theories and principles of planning. It covers typology, evolution, and discussion of procedural and substantive theories in planning, implementation, public participation, and sustainability. The course will also critically examine theories with regard to planning practice within different socio-political contexts.

### **MBEW1123 Research Methodology**

This course is concerned with the theory and philosophy of knowledge discovery, research and research methodology. The course covers the theory and philosophy of research, research methods, research methodology, research design, purpose of research, types or classification of research, and research process and procedures.

### **MBEW2143 Negotiation in Planning**

This course introduces students to the practice of negotiation and mediation in the context of urban planning and development. Learning from general theories of negotiation and conflict resolution, students will consider the role of urban planners as mediators and consensus-builders who must reconcile conflicting visions about how the city should be designed and developed.

### **MBEW1053 Rural Community & Culture**

This course will introduce the diverse range of communities, landscape, and culture tradition that constitute rural areas. It examines the various approaches and strategy of rural community development implemented in Malaysia and other countries. This course will also explore how the diverse problems and potentials, needs and inspirations should be addressed by planners.

**MBEW1073 Planning for Contemporary Social Issues**

This course exposes the students to the magnitude of social issues and problems in the urban context. It covers overviews of social issues facing the cities and focuses on such issues as urban growth and urbanization, poverty and inequality, urbanization and the informal economy, and the resultant policy and planning implications.

**MBEW1113 Economics and the Environment**

This course equips the students with the basic knowledge in economic and environmental relationship and trends in contemporary economic and environmental management. It includes development and environmental relationship, tools of sustainability assessment, the adverse impacts of development on economics and the environment and the economic consequences on the environment.

**MBEW2135 Research Project**

The aim of the course is to train students in academic research and writing. It requires individual students to undertake investigative studies and produce a dissertation on a topic relevant to urban and regional planning. The tasks involved are identification of problems/issues; literature review; data collection, analysis and interpretations of research findings.

**MBEW1043 Sustainable Transportation Planning**

This course equips the students with the theory of sustainable transportation planning and their impact on the economy, society and the environment through promotion of sustainable public transportation and non-motorized modes. It also examines the role of institutions, stakeholders and policies in promoting sustainable transportation.

**MBEW1063 Spatial Analysis Tools (GIS)**

The aim of this course is to provide exposure and training on various methods of spatial analysis in GIS environment to solve urban planning issues. The course introduces the fundamental concepts of GIS, spatial data management and various spatial analyses used in urban and regional planning.



## Master of Science (Construction Contract Management)

### Introduction

The programme is designed based on the conception that: “a project manager or contract manager” will be more adept in evaluating and selecting a contracting system that is most appropriate to the requirements of the work and conforming to the economic, legal, cost, time and quality requirements and managing it efficiently and effectively, if they are knowledgeable in the principles and philosophy of construction law and operational aspects of the various project procurement and contracting systems”. Contract managers are required to monitor the cost, scope, quality, and time frame and must ensure that all contract conditions are met. This important job affects both the financial and the actual success of the project or company.

### Name of Award

Master of Science (Construction Contract Management)

### Programme Educational Objectives

- PEO1 To produce competent construction contract administrators or managers who are very knowledgeable and well versed with construction project management, project procurement and construction law and able to evaluate, select and manage the various types of construction contracts and their associated legal and administrative problems;
- PEO2 To meet the recommendations of the Master Plan of Higher Education which stipulates that the number of effective and high quality postgraduates programs should be increased.
- PEO3 To meet the aspirations of the Economic Transformation Programme that require human resources with knowledge and skills to act as the economic generators such as those in the construction industry
- PEO4 To further enhance the collaboration and cooperation between UTM and the industry and the practising professionals;
- PEO5 To further enhance the activities of technology transfer, diffusion and innovation among academics, practitioners and students

### Programme Learning Outcomes

- PO1 Demonstrate the mastery of advanced knowledge about the principles and practice of construction project procurement and contract management, and dispute resolution
- PO2 Demonstrate the research capacity in construction contract management and related fields with minimal supervision
- PO3 Demonstrate the ability to think critically and be able to resolve the issue and the problems related to contract management practices



- PO4 Demonstrate ability to carry out responsibilities in compliance with applicable legal codes and professional ethics in construction contract management and related fields
- PO5 Demonstrate effective communication in resolving issues related to the acquisition of the construction project and contract management environment
- PO6 Demonstrate competence in managing information needed for lifelong learning

## Mode and Duration of Study

Mode of Study	Full-time
Minimum Duration	1 year
Maximum Duration	4 Years

### Classification of Courses

Classification	Credit Hours	Percentage
1. University		
a. General	3	14.6
b. Research Methodology	3	
2. Programme Core	19	46.4
3. Programme Electives	10	24.4
4. Master Project	6	14.6
<b>Total</b>	<b>41</b>	<b>100</b>

## Award Requirements

For the award of Master of Science (Construction Contract Management), the students should achieve a total minimum of 41 credit hours with minimum CPA of 3.0, including the completion of Research Project.



## List of Courses According To Semester

### Semester 1

Courses	Credit	Total Credit
1. MBEG1014 Construction Project Management	4	16
2. MBEG1024 Construction Business++	4	
3. MBEG1033 Construction Contract Studies 1	3	
4. MBEG1043 Law of Contract, Tort, Agency & Sales of Goods	3	
5. MBEG1053 Land, Planning and Environmental Law	3	
6. MBEG1063 Construction Environment**	3	
7. MBEG1073 Construction Project Development**	3	
8. UXXX xxx3 University General Course	3	

### Semester 2

Courses	Credit	Total Credit
1. MBEG1103 Construction Project Procurement	3	19
2. MBEG1113 Arbitration	3	
3. MBEG1123 Alternative Dispute Resolution (ADR) & Adjudication	3	
4. MBEG1134 Construction Contract Studies 2	4	
5. MBEG1143 Case Studies	3	
6. MBEG1153 Research Methodology	3	

### Short Semester

Courses	Credit	Total Credit
1. MBEG1176 Research Project	6	6

Note: \*\* These are elective courses for students with LL.B. They may choose to take these subjects in lieu of MBEG1043 Law of Contract, Tort, Agency and Sales of Goods and MBEG1053 Land, Planning and Environmental Law

\*\* Students may take up this course in lieu of MBEG1014

## Syllabus Synopsis

### **MBEG1063 Construction Environment**

This course will provide students with in-depth knowledge and understanding on the types of construction project development processes, building team members, materials and services. The scope of construction works will include building and infrastructure works.

### **MBEG1073 Construction Project Development**

This course will provide students with in-depth knowledge and understanding about the activities and the parties involved in the construction project delivery processes from inception to completion i.e from pre-contract to post-contract stages. This course will include regulations of health and safety on site, the occupancy and maintenance stages of the construction projects.

### **MBEG1043 Law of Contract, Tort, Agency and Sale of Goods**

The course equips students with the necessary knowledge in order for them to effectively comprehend the discussion in the core courses of Construction Contract Studies I & II. The main focus is on the law of contract beginning from the formation of contract, essentials of valid contract, void and voidable contracts, discharge of contract and remedies for breach of contract. The scope of the law tort, agency and sale of goods are focused on those aspects that are relevant to issues in construction contracts.

### **MBEG1053 Land, Planning & Environmental Law**

The course equips students with knowledge on land development laws in order for them to effectively understand the legal basis of the clauses in construction contracts. The main content of this course concerns the principles of land law and land administration, strata title, conveyance, planning and environmental laws.

### **MBEG1014 Construction Project Management**

It is a course that discusses the concept and application of project management and operational research. It is divided into 3 parts; the concept and application of system approach and strategic thinking in project management; principles of construction project management; and the science of management and operational research. It also looks at management information system and ICT and their application in construction project management.

### **MBEG1024 Construction Business**

This course introduces students to the basics of construction business management combining knowledge gained in construction technology and processes, management, economics and finance from other courses in providing the management tools to help manage a construction business enterprise towards achieving organisational objectives.

### **MBEG1033 Construction Contract Studies 1**

This course introduces to students the basic laws relating to construction contract. It discusses the nature of construction contracts, formation of construction contracts, the use of standard forms of contract, roles, duties and liabilities of consultants, distribution of risks, insurance and bonds in construction contracts and the effects of insolvency to the effectiveness of the clauses in standard forms of contract.

### **MBEG1103 Construction Project Procurement**

This course provides the students with in depth knowledge and understanding about the concept and application of the various construction project delivery systems. It also looks into the various methods of bidding and tendering and the latest application of partnering and alliance systems.

### **MBEG1123 Alternative Dispute Resolution (ADR) & Adjudication**

This course introduces students the various methods of dispute resolution that are being utilized in the construction industry as alternatives to litigation and arbitration. It gives special treatment to the adjudication provisions set out in the Construction Industry Payment and Adjudication Act (CIPAA) 2012 as well as the processes and procedures in mediation, conciliation, dispute review board and others. It also examines dispute resolution clauses in PWD, PAM, CIDB and FIDIC.

### **MBEG1134 Construction Contract Studies 2**

This course is an extension of the Construction Contract Study 1. It generally examines the important terms in construction contracts with special reference to the PWD and PAM standard forms as well as other forms such as CIDB, JCT and FIDIC. This course also discusses issues relating to subcontracting and international contracting.

### **MBEG1143 Case Studies**

This course helps develop students' analysis and critical thinking. It also prepares them with the basic knowledge on legal research methodology. Students are assigned with specific topics for discussion; in addition they are given materials such as articles and books to be analyzed and criticised. They are also required to produce research proposals.

### **MBEG1113 Arbitration**

This course discusses the law relating to domestic and international arbitration in Malaysia. It generally examines the arbitration process and procedure as set out in the legislations, the institutional rules and arbitration agreements. In the course of the discussions, it makes specific reference to the Arbitration Act 2005, the KLRCA and UNCITRAL rules and the PWD and PAM standard forms of contract.

### **MBEG1153 Research Methodology**

This course is concerned with the theory and philosophy of knowledge discovery, research and research methodology. The course covers the theory and philosophy of research, research methods, research methodology, research design, purpose of research, types or classification of research, and research process and procedures.

### **MBEG1176 Research Project**

The aim of the course is to train students in academic research and writing. It requires individual students to undertake investigative studies and produce a dissertation on a topic relevant either to construction contract management, procurement, dispute resolution and project management. The tasks involved are identification of problems/issues; literature review; data collection, analysis and interpretations of research findings. Students shall be required to submit and orally present their dissertation.

## Master of Science (Transportation Planning)

### Introduction

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

### Name of Award

Master of Science (Transportation Planning)

### Programme Educational Objectives

- PEO1 To provide an understanding of the complex theories and principles of transportation planning as well as the scope and role of transportation planning in the management of growth and change
- PEO2 To apply a range of analytical skills and techniques to address a range of complex transportation problems
- PEO3 To apply the knowledge, skills and understanding to the achievement of feasible solutions to transportation planning problems
- PEO4 To work in multi-discipline team and contribute to the society
- PEO5 To comply with ethics, professional and community standards, and involve in life-long learning

### Programme Learning Outcomes

- PO1 Develop advanced knowledge in transportation theories, strategies and efficient planning.
- PO2 Apply advanced research skills, planning tools and analytical techniques in solving complex transportation problems.
- PO3 Apply critical thinking skills in proposing optimal solutions to transportation problems.
- PO4 Apply high ethical standards in professional practice and social interactions.
- PO5 Communicate, orally or in writing, appropriate technical and management information in appropriate form. Also able to function effectively and productively as a leader and team member.
- PO6 Perpetually seek and acquire contemporary knowledge in transportation planning.



## Mode and Duration of Study

Mode of Study	Full-time
Minimum Duration	1 ½ years
Maximum Duration	4 years

## Classification of Courses

Classification	Credit Hours	Percentage
1. Programme Core	18	
2. Programme Electives	10	
3. Research Project	6	
4. Compulsory University Course (including Research Methodology)	6	
<b>Total</b>	<b>40</b>	<b>100</b>

## Award Requirements

For the award of Master of Science (Transportation Planning), the students should achieve a total minimum of 40 credit hours with minimum CGPA of 3.00, including the completion of Research Project.

## List of Courses According To Semester

### Semester 1

Courses	Credit	Total Credit
1. MBEJ1013 Transport Law	3	15
2. MBEJ1023 Planning Analytical Methods	3	
3. MBEJ1033 Logistics and Freight Transportation	3	
4. MBEJ1043 Public Transport System and Operations	3	
5. UXXX xxx3 University General Course	3	

### Semester 2

Courses	Credit	Total Credit
1. MBEJ1053 Transport Economics	3	13
2. MBEJ1063 Transport, Society and the Environment/ MBEJ1073 Transport Geography	3	
3. MBEJ1084 Case Studies in Public Transportation/ MBEJ1094 Case Studies in Freight Transportation	4	
4. MBEJ1103 Research Methodology	3	

### Semester 3

Courses	Credit	Total Credit
1. MBEW1023 Sustainable Land Use Planning/ MBEW1103 Urban Governance and Management/ MBEW2263 Spatial Planning Tools (GIS)	3	12
2. MBEJ2113 Transport Risks, Safety and Security	3	
3. MBEJ2126 Research Project	6	

## Syllabus Synopsis

### **MBEJ1013 Transport Law**

This course exposes the students the various acts, regulations and conventions that shape and define how the transport industry functions. The acts covers both domestic and international acts. The ability to understand these legal framework is crucial for the students to appreciate the complexities of the transportation industry.

### **MBEJ1023 Planning Analytical Methods**

This course equips the students with the theory and practice to analyze transportation data using statistical analysis. Students learns to apply analytical techniques like correlation, regression, ANOVA and test of hypothesis to make informed decisions based on collected data.

### **MBEJ1033 Logistics and Freight Transportation**

Freight transportation and the overall logistics functions are critical to the sustainability of a trading nation. This course provides students with extensive understanding of the relationship between transportation and economic growth as well as global trade participation. Critical components that define and regulate freight transportations are covered in details.

### **MBEJ1043 Public Transport Systems and Operations**

Planning for public transportation is an integral part of city planning. Thus, the success of a city very much depends on the efficiency of its public transportation. However, the provision of quality public transportation services involves a lot of complex activities which some of them are covered in this subject.

### **MBEJ1053 Transport Economics**

Understanding the demand and supply of transportation services is a complex subject. When private and public sectors intertwine to define these services, the subject becomes more complicated. This subject helps to clarify some of these issues through the perspective of economic theories.

### **MBEJ1063 Transport, Society and the Environment**

This course equips the students with the theory of urban structures and their effect on the efficiency of transport services and modal split. Students will also understand the needs for sustainability in transportation as well as the impact of transportation on the environment. Also, this course provides the opportunity to evaluate the role of public transportation in promoting sustainable transportation.

### **MBEJ1073 Transport Geography**

Transportation operates across borders and the catalyst of mobility. Without transport, people and commodities will not flow from the source to the destination. This course provides students the fundamental understanding about how transportation functions in creating mobility and flows over spaces.



**MBEJ1084/MBEJ1094 Case Studies in Public Transportation/Case Studies in Freight Transportation**

This course presents an opportunity for the students to analyze, 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.

**MBEJ1103 Research Methodology**

This course equips the students with the theory and practice of conducting an academic research. The students will be taught on the process of doing a research from defining the research problem to documenting the research result. The students will learn to prepare the proposal for their masters project.

**MBEJ2113 Transport Risks, Safety and Security**

This course equips the students with the theory of safety and security in transportation operations/business. Students will then learn how to evaluate the risks associated with the issues of safety and security. At the end, students will understand the impact of that risks on enterprise's well-being/profitability.

**MBEJ2126 Research Project**

This course allows students to conduct an academic research on the field of transportation based on the proposal submitted and approved during MBET1293 Research Methodology. In this course, students will perform their research based on the plan outlined in their research proposal with the aim of solving real-life transportation problem.

**MBEW1023 Sustainable Land Use Planning**

This course educates the students on the concepts and principles of sustainable land use planning. It focuses on effective planning policies and instruments to ensure sustainable urban growth. The students will have the necessary land use analysis and management skills for land use decision making and resolving conflicts between natural and built systems for sustainable land use plans.

**MBEW1103 Urban Governance and Management**

This course is designed to provide students with the understanding of tools of urban governance and management. It covers principles of good urban governance, urban management concept and key elements of urban management. Urban governance includes pertinent issues and key constitutional concepts within the area of land use law and the essential legal precepts in the administration of land use. It examines the regulatory tools to implement land use planning doctrines that empower governments to regulate land use and activities. Urban management section part of the course highlight current urban issues concerning such as waste management, pollution and infrastructure provision and maintenance.

**MBEW2263 Spatial Analysis Tools (GIS)**

The aim of this course is to provide exposure and training on various methods of spatial analysis in GIS environment to solve urban planning issues. The course introduces the fundamental concepts of GIS, spatial data management and various spatial analyses used in urban and regional planning.



## Master of Science (Tourism Planning)

### Introduction

Jointly conducted by the Department of Urban and Regional Planning and the Faculty of Management, the programme adopts a flexible teaching approach to suit the needs of both fresh graduates as well as practitioners in producing skilled and highly trained tourism planners. The teaching approach has evolved from its urban planning tradition since the inception of the course in 1998 to a multi-disciplinary and collaborative approach based on the principles of sustainability. A distinct feature of the course is 'hands on' learning through 'live' projects. The programme also covers the whole spectrum of tourism planning such as ecotourism, urban tourism, rural tourism, heritage tourism, island tourism, and sustainable tourism.

### Name of Award

Master of Science (Tourism Planning)

### Programme Educational Objectives

- PEO1 Demonstrate an understanding of the complex theories and principles of tourism planning as well as the scope and role of planning in the tourism management of growth and change;
- PEO2 Apply a range of analytical skills and techniques that are designed to address a range of complex problems;
- PEO3 Apply the knowledge, skills and understanding to the achievement of feasible solutions to tourism planning problems;
- PEO4 Work in multi-discipline team and contribute to the society.
- PEO5 Comply with ethics, professional and community standards, and involve in life-long learning.

### Program Learning Outcomes

- PO1 Provides an understanding of the complex theories and principles of tourism planning as well as the scope and role of tourism planning in the management of growth and change.
- PO2 Apply a range of analytical skills and techniques to address a range of complex tourism planning problems.
- PO3 Apply the knowledge, skills and understanding to the achievement of feasible solutions to tourism planning problems.
- PO4 Work in multi-discipline team and contribute to the society
- PO5 Comply with ethics, professional and community standards, and involve in life-long learning.

## Mode and Duration of Study

Mode of Study	Full-time
Minimum Duration	1 ½ years
Maximum Duration	4 years

## Classification of Courses

Classification	Credit Hours	Percentage
1. University		
a. General	3	14
b. Research Methodology	3	
2. Programme Core	18	38
3. Programme Electives	12	29
4. Research Project	9	19
<b>Total</b>	<b>45</b>	<b>100</b>

## Award Requirements

For the award of Master of Science (Tourism Planning), the students should achieve a total minimum of 45 credit hours with minimum CGPA of 3.00, including the completion of Research Project.



## List of Courses According to Semester

### Semester 1

Courses	Credit	Total Credit
1. MBEK1013 Tourism Planning	3	15
2. MBEK1023 Tourism Management	3	
3. MBEK1033 Tourism Analysis/ MBEK1043 Tourism and Community	3	
4. MBEK1056 Studio 1	6	

### Semester 2

Courses	Credit	Total Credit
1. MBEK1063 Tourism Marketing/ MBEK1073 Tourism Economics and the Environment	3	15
2. MBEK1086 Studio II	6	
3. MBEK1093 Sustainable Planning & Development/ MBEK1103 Rural Community and Culture	3	
4. MBEK1113 University Course – Research Methodology	3	

### Semester 3

Courses	Credit	Total Credit
1. MBEK1129 Research Project	9	15
2. MBEK1133 Tourism Product Planning/ MBEK1143 Planning for the Social Issues	3	
3. University course	3	

## Syllabus Synopsis

### **MBEK1013 Tourism Planning**

The aim of the course is to provide the candidates with principles of tourism planning. Tourism planning is a process that involves an interdisciplinary approach aimed at creating vibrant, attractive, economically viable, socially responsible and environmentally sustainable tourism products/destination areas.

### **MBEK1033 Tourism Analysis**

The aim of the course is to provide the candidates with an introduction to general principles and components of supply and demand of tourism. In this scenario, the complexities of tourism will be studied so that tourism planner will be able to understand the elements and the factors that need to be considered in tourism analysis. Case studies analysis is used where appropriate to develop problem-solving skills and to provide opportunities for the practical application of theory and concepts learned in class.

### **MBEK1023 Tourism Management**

The aim of the course is to provide students with a cumulative body of knowledge and information that furnishes insights on how to manage tourism development. The first part of the course is an introduction, looking at the various definitions of tourism, its importance and the evolution of tourism to the present day. The second part will look at the functional management of tourism while the third section will be on managing the impact of tourism.

### **MBEK1063 Tourism Marketing**

The aim of the course is to provide students with a framework for understanding and learning marketing and its application in the various sectors of the tourism industry. The first part of the course will provide an overview of the main concepts and principles, which emphasize marketing as a set of managerial practice. The second section will examine a number of important current issues affecting tourism marketing such as branding and destination marketing and evaluating NTO marketing activities.

### **MBEK1056 Studio I**

The aim of the course is to train the student in preparing Tourism Development Plan as well as to provide understanding of the important of sustainable planning principles and its relation to tourism development. The concept is highly pertinent to the planning of tourism products/destination areas in Malaysia which require any tourism development plan to be prepared with good assessment and able to formulate strategies and mechanisms that are aimed to maximise the potential of tourism destination.

### **MBEK1086 Studio II**

This course is the continuity from Studio I, involves the conception of a tourism development plan and charting appropriate strategies to achieve its stated goal and objectives sets in Studio I. It provides for the application of tourism planning and design principles for generating the optimum plan solutions. From the tourism planning standpoint, the proposed development plan serves as a developmental roadmap for the planned period, aimed at guiding decision makes, tourism planners, designers and builders in carrying tourism development activities consistent with the overall plan aspiration.

### **MBEK1129 Research Project**

The aim of the course is to train students in academic research and writing. It requires individual students to undertake investigative studies and produce a dissertation on a topic relevant to urban and regional planning. The tasks involved are identification of problems/issues; literature review; data collection, analysis and interpretations of research findings.

### **MBEK1133 Tourism Product Planning**

One of the most common problems in auditing tourism attractions by decision makers in tourism development (e.g. Ministry of Tourism, Local Authority, State Government and State Tourism Action Council) is to evaluate qualitative perception of visitors or tourists towards attractions they have visited. A systematic procedure using modification of techniques such as Content Analysis will allow the attractions to be analyzed according to themes (e.g. uniqueness, activity, access, basic facilities, interpretation, accommodation, maintenance and service).

### **MBEK1093 Sustainable Tourism Planning & Development**

The aim of the course is to provide the students with principles of sustainable planning and its relation to tourism development. The course discusses how the tourism industry markets physical environments, thus, 'push' and 'pull' factors that give rise to the need to manage tourism development that often less considered by town (or urban) and regional planner. The course covers the whole spectrum of urban and regional environment related to the principles of sustainable development and sustainable tourism.

### **MBEK1103 Rural Community and Culture**

This course will introduce the diverse range of communities, landscape, and culture tradition that constitute rural areas. It examines the various approaches and strategy of rural community development implemented in Malaysia and other countries. This course will also explore how the diverse problems and potentials, needs and inspirations should be addressed by planners.

### **MBEK1143 Planning for Contemporary Social Issues**

This course exposes the students to the magnitude of social issues and problems in the urban context. It covers overviews of social issues facing the cities and focuses on such issues as urban growth and urbanization, poverty and inequality, urbanization and the informal economy, and the resultant policy and planning implications.

### **MBEK1073 Tourism Economics and the Environment**

This course is designed to equip students with the basic knowledge in economic and environmental relationship and trends in contemporary economic and environmental management. It includes development and environmental relationship towards a balanced economic development and environmental conservation, tools of sustainability assessment, the adverse impacts of development on economics and the environment, fundamental economic forces and the economic consequences on the environment.

### **MBEK1113 Research Methodology**

This course is concerned with the theory and philosophy of knowledge discovery, research and research methodology. The course covers the theory and philosophy of research, research methods, research methodology, research design, purpose of research, types or classification of research, and research process and procedures.

## Master of Science (Geomatics Engineering)

The Master of Science (Geomatics Engineering) course consists of 6 core courses, 3 elective courses and 1 University course. The elective courses are divided into two specializations (Survey & Mapping, and Utility Mapping). In addition to these subjects, students are required to submit a Master Project worth of 8 credits. To graduate, students must complete a total of 45 credits and they are assessed through assignments, presentations and final examination. The curriculum of the program is shown.

### Name of Award

Master of Science (Geomatics Engineering)

### Programme Educational Objectives

#### Programme Learning Outcomes

- PO1 Be able to demonstrate mastery of knowledge in the geomatic engineering field
- PO2 Be able to apply practical skills in the geomatic engineering field
- PO3 Be able to relate ideas to societal issues in the geomatic engineering field
- PO4 Be able to conduct research with minimal supervision and adhere to legal, ethical and professional code of practice
- PO5 Be able to demonstrate leadership qualities through communicating and working effectively with peers and stakeholders.
- PO6 Be able to generate solutions to problem using scientific and critical thinking skill
- PO7 Be able to manage information for lifelong learning.



## Mode and Duration of Study

Mode of Study	Full-time
Minimum Duration	1 year
Maximum Duration	4 Years

### Classification of Courses

Classification	Credit Hours	Percentage
1. University		
a. General	3	14.6
b. Research Methodology	3	
2. Programme Core	19	46.4
3. Programme Electives	10	24.4
4. Master Project	6	14.6
<b>Total</b>	<b>41</b>	<b>100</b>

## Award Requirements

For the award of Master of Science (Geomatics Engineering), the students should achieve a total minimum of 41 credit hours with minimum CPA of 3.0, including the completion of Research Project.





## List of Courses

### List of Courses for Master of Science (Geomatics Engineering)

Codes	Courses	Credits
<b>UNIVERSITY COURSE (3 CREDITS)</b>		
UHAW 6023	University Subject	3
<b>CORE COURSES (22 CREDITS, COMPULSORY)</b>		
MGHU 1014	Geomatics Positioning	4
MGHU 1024	Geomatics Data Analysis	4
MGHU 1034	Advances Mapping	4
MGHU 1043	Geomatics Project Management	3
MGHU 1054	Geographical Information System	4
MGHU 1063	Research Methodology	3
<b>MASTER PROJECT (8 CREDITS)</b>		
MGHU 1378	Master Project	8
<b>ELECTIVE COURSES (CHOOSE ONE (1) SPECIALIZATION GROUP ONLY) (12 CREDITS)</b>		
<b>SPECIALIZATION A: SURVEY &amp; MAPPING</b>		
MGHU 1514	Cadastral Studies	4
MGHU 1524	Advances Engineering Survey	4
MGHU 1534	Hydrographic Survey Application	4
<b>SPECIALIZATION B: UTILITY MAPPING</b>		
MGHU 1544	Underground Utility Surveying	4
MGHU 1554	Geophysics for Utility Surveying	4
MGHU 1564	Utility Mapping Standard & Practice	4
<b>TOTAL NUMBER OF CREDITS</b>		<b>45</b>



## Syllabus Synopsis

Course Code	Course Name	Synopsis
MGHU 1014	Geomatic Positioning	The course is design to give comprehensive knowledge on the concepts, techniques and procedures in satellite navigation, satellite surveying. New technologies and development in GNSS are explained
MGHU 1024	Geomatic Data Analysis	The course is design to give comprehensive knowledge on the concepts, techniques and procedures in geospatial adjustment. Trends and new technology in modern least squares technique and its applications are discussed.
MGHU 1034	Advance Mapping	The course is design to give comprehensive knowledge on the concepts, techniques and procedures in advance mapping. Trends and new technology in advance mapping and analytical processing are explained such as close range photogrammetry, terrestrial laser scanning and others
MGHU 1043	Geomatic Project Management	This subject introduces students to the discipline of planning, organizing, and managing resources to bring about the successful completion of specific goals and objectives in Geomatics project. These include project initiation stage, project planning or design (estimating time and cost for project activities; developing the schedule; developing the budget; risk planning), project implementation, project monitoring and controlling system (the element of a project that keeps it on-track/time and within budget). Also the students will learn about the role of project manager, project variables, corrective actions identification, risk factors, etc), project output/delivery and cost-benefit analyses. At the end of this course, students will be able to understand the process flow of Geomatics project management.
MGHU 1054	Geograohical Information System	The course is designed to give the student advanced understanding of Geographic Information System. All related philosophies, theories and methodologies of GIS/LIS will be explained. Geo-database, Advanced concepts, SDI, Application and Recent issues will be covered.
MGHU 1063	Research Methodology	Understanding on method of preparation of academic research proposal and method of technical writing. Research proposal presentation and communication skill.

Course Code	Course Name	Synopsis
MGHU 1078	Master Project	This course is designed to increase knowledge and skill in problem solving through academic approaches. The approaches include objective, analytical problem solving and able to manage research outcomes systematically.
MGHU 1514	Cadastral Studies	The course is design to give comprehensive knowledge on the concepts, techniques and procedures in cadastral practice and modern. Spatially enabled government using modern Cadastre.
MGHU 1524	Advance Enginnering Survey	The course is design to give comprehensive knowledge on the concepts, techniques and procedures in advanced engineering surveying. Trends and new technology in data acquisition technique and its applications such as Ground Penetrating Radar (GPR), Terrestrial Laser Scanning (TLS) and others.
MGHU 1534	Hydrographic Survey Application	This course is to provide comprehensive knowledge of the Hydrographic Surveying such as hydrographic positioning, hydrographic hardware and software, automated bathymetry data acquisition, datum, tidal analysis, Coastal engineering, and oceanography. Roles of Hydrography in offshore surveying, oil and gas industry.
MGHU 1544	Underground Utility Surveying	The course is designed to give the student comprehensive understanding on the aspect of underground utility surveying for utility mapping purposes. All related philosophies, theories and methodologies of underground utility surveying will be explained.
MGHU 1554	Geophysic for Utility Surveying	The course is designed to give the student comprehensive understanding on the aspect of geophysics as applied in underground utility surveying. All relevant elements of geophysics for utility survey will be explained.
MGHU 1564	Utility Mapping Standard & Practice	The course is designed to give the student comprehensive understanding regarding the standard and practice aspects of utility surveying and mapping tasks. All the current standards relevant to related field work exercise and utility mapping practice will be explained

## Master of Science (Geoinformatics)

The Master of Science (Geoinformatics) course consists of 6 core courses, 3 elective courses and 1 University course. In addition to these subjects, students are required to submit a Master Project worth of 8 credits. To graduate, students must complete a total 45 credits and they are assessed through assignments, presentations and final examination.

## Name of Award

Master of Science (Geomatics Engineering)

## Programme Educational Objectives

- PEO 1 Establish themselves with knowledge, expertise and professionalism in Geoinformatics and all related areas.
- PEO 2 Effectively handle and resolve problem and issues related to profession.
- PEO 3 Engage themselves in managing GIS project and entrepreneurship activities in Geoinformatics profession.
- PEO 4 Effectively communicate with the stakeholders and related parties.
- PEO 5 Demonstrate continuous learning process and systematic approach in problem solving with good ethic and professional code of practice.

## Programme Learning Outcomes

- PO1 Be able to demonstrate mastery of knowledge in the Geoinformatics field and related technologies
- PO2 Be able to apply practical skills in the Geoinformatics field and related technologies for varieties of GIS application
- PO3 Be able to relate ideas to societal issues in the Geoinformatics field
- PO4 Be able to conduct research with minimal supervision and adhere to legal, ethical and professional codes of practice.
- PO5 Be able to demonstrate leadership qualities through communicating and working effectively with peers and stakeholders.
- PO6 Be able to generate solutions to problems using scientific and critical thinking
- PO7 Be able to manage information for lifelong learning

## Mode and Duration of Study

Mode of Study	Full-time
Minimum Duration	1 year
Maximum Duration	4 years

Codes	Courses	Credits
<b>UNIVERSITY COURSE (3 CREDITS)</b>		
UHAW 6023	University Subject	3
<b>CORE COURSES (22 CREDITS, COMPULSORY)</b>		
MGHG 1114	Principles of GIS	4
MGHG 1124	Geospatial Databases	4
MGHG 1134	Spatial Analysis & Modeling	4
MGHG 1223	Research Methods in GIS	3
MGHG 1234	Geospatial Data Management	4
MGHG 1243	Programming for GIS	3
<b>MASTER PROJECT (8 CREDITS)</b>		
MGHG 2218	Master Project	8
<b>ELECTIVE COURSES (CHOOSE THREE (3) COURSES) (12 CREDITS)</b>		
MGHG 1514	Geospatial Data Acquisition and Processing	4
MGHG 1524	GIS Project Management	4
MGHG 1534	GIS Applications	4
MGHG 1544	GIS Application Development	4
MGHG 1554	GIS Implementation	4
MGHG 1564	GIS & Public Policy	4
MGHG 1574	Cartography and Visualization	4
<b>TOTAL NUMBER OF CREDITS</b>		<b>45</b>



## Syllabus Synopsis

Course Code	Course Name	Synopsis
MGHG 1114	Principles of GIS	<p>This is one of the core courses designed to provide an understanding of theory and principles of geospatial information science and technology (GI S&amp;T) and basic skills in using Geographic Information System (GIS) software. The topics covered include: Maps and their characteristics; Conventional mapping vs digital mapping vs Geographic Information Systems (GIS); Concepts of geospatial data; Digital data storage; Computer software (word processing, 'spreadsheet', database system); GIS definitions; GIS subsystems (Data Input,</p> <p>Data Storage &amp; Management, Data Manipulation &amp; Analysis, Data Output); Model &amp; data structure of geospatial data (vector data model, tessellation data model, Digital Elevation Model/ DEM); Model data conversion (vector &lt;-&gt; raster); Coordinate system (curve vs plane coordinates, map projection, plane coordinate manipulation); Height data manipulation; Accuracy of geospatial data (positional, attributes); GIS working components (technology, data, users). Implementation issues (data, organizational); GIS System procurement.</p>
MGHG 1124	Geospatial Databases	<p>Introduction to data and database systems, file-based system, database approach, database management system, database environment, three level ANSI-SPARC Architecture, database language: DDL &amp; DML, data models, relational model, relational algebra, and calculus, structure query language objectives and commands, data manipulation, database planning, analysis and design techniques, entity relationship modelling, types, relationships, attributes, normalization purpose and process, 1NF, 2NF, 3NF, and BCNF, database design methodology, conceptual database design methodology, logical database design methodology for relational model, physical database design methodology for relational model.</p>
MGHG 1134	Spatial Analysis & Modeling	<p>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 point data analysis, lines and network data analysis, area objects and spatial autocorrelation, raster or fields based analysis and new approaches to spatial analysis. The course features extensive use of geospatial analysis software tools through group as well as individual project works.</p>

MGHG 1234	Geospatial Data Management	<p>This course is designed to provide the students with a greater emphasis on the understanding of geospatial data and how, in practice, it is handled and managed. Among the topics covered throughout the course are:</p> <ul style="list-style-type: none"> <li>▪ General problems with geospatial data handling and related issues</li> <li>▪ Geospatial data standard, sharing/ exchange &amp; distribution (MaCGDI, MS1759, feature and attribute coding, metadata, data catalogue, My Geoportal, data security)</li> <li>▪ Geospatial data storage (sources, format, conversion, compression)</li> <li>▪ Data Quality(error sources, error in map digitizing, tracking error in coordinate transformation, improvement of spatial accuracy)</li> <li>▪ Data Integrity and Topology (planar, network, error checking, logical consistency)</li> <li>▪ Global Positioning System (GPS) data capture &amp; processing (differential correction, coordinate transformation, height data reduction, accuracy enhancement)</li> <li>▪ Height/ surface data handling (JUPEM's topographic data, GPS data, LiDAR data, geological data, interpolation, extrapolation, TIN, DEM)</li> <li>▪ Data transfer (format, compression, methods)</li> <li>▪</li> </ul>
MGHG 1243	Programming for GIS	<p>There are two goals for this course. First, students will be exposed to introductory programming using either Python, VBA, Ruby or IDL. The students will learn the programming logic, flow control and structured and OO programming. The students also will learn how to start using the programming and scripting features of common GIS and remote sensing (RS) platforms. Second, students will choose one or more GIS/RS platforms and explore its scripting languages in solving any of a variety of GIS/RS problems programmatically (<i>e.g. automating procedures, modelling, custom image processing, spatial statistics, etc.</i>).</p>
MGHG 1514	Geospatial Data Acquisition and Processing	<p>This is one of the elective courses designed to provide an understanding of the fundamental principles of photogrammetry and remote sensing. In photogrammetry, the emphasis will be given on the theory and methodology for the production of topographic map, plan, digital terrain model (DTM), orthophoto and rectified photo using aerial photographs. On the other hand, the course on Remote Sensing exposes the students to the concepts of satellite mapping and provides them with technical skill in image processing (image enhancement, transformation and classification).</p>



Course Code	Course Name	Synopsis
MGHG 1524	GIS Project Management	<p>This course presents the principles, methods and techniques, and practices of project management to be applied to Geographic Information System (GIS) projects. The aim of this course is to provide students with a practical understanding of basic project management techniques and to enable them to use the knowledge and skills to solve varieties of GIS problems. To meet this aim, the course features a phased approach and extensive use of project management software. In order to increase the effectiveness of students learning, they are encouraged to plan and initiate a GIS project for their group project assignment.</p>
MGHG 1544	GIS Application Development	<p>This is one of the core courses designed to provide a more detailed knowledge about GIS software especially those that are commonly used by the GIS community. Students are also exposed with more hands-on exercises using the software. The outline of the course is as below:</p> <ul style="list-style-type: none"><li>• GIS software in the market: Focus on ESRI products, MapInfo and Geomedia</li><li>• Supported Data Model/ Structures: Vector, Tessellation (Raster); Topological, Non topological</li><li>• Adopted database concepts: georelational, object-oriented</li><li>• Software functions: Input, Storage &amp; Management, Manipulation &amp; Analysis, Output</li><li>• Integration with external software: packages - DBMS, modeling, mapping, statistical</li><li>• Development &amp; Enhancement: C++, Avenue, VBA, other programming languages</li><li>• Supported platforms: OS, platform</li><li>• GIS Software - ESRI Products (ArcView, ArcInfo, ArcGIS, ArcPad, Model Builder, What-If)</li><li>• GIS Software - MapInfo</li><li>• GIS Software - Geomedia</li></ul>



## Master of Science (Remote Sensing)

### Introduction

Remotely sensed technologies has been one of the prominent and future frontiers in data acquisition for various environmental fields. Acquiring the knowledge, science and practices are vital in successful utilization of this technology to the maximum. It requires specific understanding of the theories, skills in processing and handling of the technology, and sound communication with the prospective users from different scientific backgrounds. To produce experts that are able to operate, utilize, manage and innovate remote sensing technology to the optimum, the Department of Geoinformation is offering a M.Sc. course in Remote Sensing to fulfil the needs towards sustainable development.

### Name of Award

Master of Science (Remote Sensing)

### Programme Educational Objectives

- PEO1 To possess knowledge, expertise and professionalism in remote sensing fields
- PEO2 To conduct high impact research to solve related problems through critical thinking
- PEO3 To practice ethical communication, life-long learning and effective social skills
- PEO4 To possess leadership qualities and able to work efficiently in an organization
- PEO5 To possess entrepreneurial and innovative mindset in achieving sustainable development

### Programme Learning Outcomes

- PO1 Demonstrate mastery of knowledge in remote sensing.
- PO2 Conduct research with minimal supervision in remote sensing.
- PO3 Relate ideas to societal issues in remote sensing.
- PO4 Apply high ethical standards in research, professional practice and social interactions.
- PO5 Demonstrate leadership qualities in studying, conducting scientific research, and communication.
- PO6 Generate solutions to problems using scientific and critical thinking skill.
- PO7 Manage remote sensing information, sciences, and technology for lifelong learning.



## Mode and Duration of Study

Mode of Study	Full-time
Minimum Duration	1 years
Maximum Duration	4 years

## Classification of Courses

Classification	Credit Hours	Percentage
1. Programme Core	22	55
2. Programme Electives	8	20
3. Research Project	8	20
4. Compulsory University Course (including Research Methodology)	2	5
<b>Total</b>	<b>40</b>	<b>100</b>

## Award Requirements

For the award of Master of Science (Remote Sensing), the students should achieve a total minimum of 40 credit hours with minimum CGPA of 3.00, including the completion of Research Project.

## List of Courses According To Semester

### Semester 1

Courses	Credit	Total Credit
1. MGHS 1014 Remote Sensing Technology	4	8
2.MGHS 1024 Digital Image Processing & Image Analysis	4	

### Semester 2

Courses	Credit	Total Credit
1.MGHS 1084 Research Methods in GIS & RS	3	7
2.MGHS xxxx Elective		

### Semester 3

Courses	Credit	Total Credit
1.MGHS 1054 Geographical Information System & Spatial Analysis	4	8
2.MGHS 1074 Microwave Remote Sensing	4	

### Semester 4

Courses	Credit	Total Credit
1.MGHS 1063 GPS Surveying	3	5
2.UHP 6022 Science and Social Development	2	

### Semester 5

Courses	Credit	Total Credit
1.MGHS xxxx Elective	4	12
2.MGHS 1998 Master's Project	8	

## Syllabus Synopsis

### **MGHS1014 Remote Sensing Technology (Core)**

This course introduces students to the principles of remote sensing. Emphasize will be given on all basic theory 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. Student will also be given hand-on laboratory works in digital image processing to familiarize them with the characteristics of digital data, particularly in understanding the spectral, spatial and temporal aspects of the satellite remotely sensed data. At the end of the course, students will have knowledge on the principles of remote sensing and an overview of related applications of the technology.

### **MGHS 1024 Digital Image Processing and Image Analysis (Core)**

Introduction to digital image processing. Concept of digital image, sampling & image digitization, image storage, image file management & display system. Digital data of remote sensing, media format, header and foot information sources. Image pre-processing: geometry correction, noise removal, radiometry correction. Image enhancement: linear and non-linear operations, image transformation. Image classification: supervised and unsupervised classifications. Output production and information processing.

### **MGHS 1054 Geographical Information System and Spatial Analysis (Core)**

Introduction to GIS. Main components of GIS: input, data storage & database system, processing system: display system and output. Spatial data and input into GIS, spatial data structure, processing unit and the need for GIS, data storage & GIS implementation & related products.

Introduction to spatial analysis: basic concept of spatial analysis, characteristics of spatial analysis, importance of spatial analysis. Spatial analysis: spatial analysis of continuous data, spatial data interaction, logic specification, arithmetic and statistics, usage of spatial analysis, spatial analysis in remote sensing, query and selection in GIS. Buffer application: entry of non-raster data, vector data and attributes. Overlay process: basic concept of overlay, mathematic calculation, Boolean logic, reclassification (union, merging, joint, etc). Spatial analysis of continuous data : neighborhood analysis, search, topological function, surface function, network analysis, circuit network and branching (tree) network, boundary selection, types of network relations and network measurements.

### **MGHS 1074 Microwave Remote Sensing (Core)**

This course is designed to provide knowledge, skills and exposure to microwave sensing. Topics will cover the radar basics, Synthetic Aperture Radar, geometric properties, statistical properties, and physical contents. Processing on the SAR image from various platforms and sensor and its applications for various environmental fields is emphasized.

### **MGHS 1998 Master project (Compulsory)**

The main aim of this course is to provide students with an opportunity to apply their knowledge, skills and techniques of geoinformatics. In this course, students will acquire skills in handling and managing their research project individually and independently with direct supervision of a supervisor.

**MGHS 1083 Research methods in Remote Sensing (Core)**

This course provides an understanding on the approaches in preparing academic and research proposals in addition to the skills in technical reporting as well as techniques in results presentation either through publication and oral. The course is also included an introduction to the field radiometry for ground truthing, methods of ground truthing and samplings in remote sensing works as well as output analysis.

**MGHS 1063 GPS Surveying (Core)**

This is one of the core courses designed to provide an understanding of theory and principles of global positioning system (GPS) together with their operation, application and differential GPS technology. The topics covered include: Overview on Geodesy and GPS; 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 and the combination of both. This course also covers the design and planning of static network and preparing for a GPS Field Survey

**MGHS 1034 Atmospheric Physics (Elective)**

This course is designed to provide an understanding of theory and principles of certain areas of physics that are directly related to the Earth atmosphere particularly about its physical and chemical aspects. Students will be able to explain atmospheric phenomena and processes, qualitative and quantitative describe them, as well as to evaluate their significance from the general point of view. The topics covered include: Atmosphere structure: thermodynamic of atmosphere; Cloud physics and remote sensing on atmospheric application: Electromagnetic wave, sound wave and oscillations, heat and temperature, concept of thermodynamic and radiation laws.

**MGHS 1534 Satellite System & Earth Station (Elective)**

This course is designed to provide an understanding of theory and knowledge of satellite system and Earth station. The topics covered include: Sensor Technologies : Data Acquisition, Sensor Characteristics, Physical Principles of Sensing and Detector, Humidity and Moisture Sensors, Electromagnetic Field Detectors, Temperature Sensors, User requirement and Mission. Earth Station: Ground receiving station, orbital characteristics, platform, data acquisition and dissemination.

**MGHS 1104 Application of Remote Sensing Technology (Elective)**

This course is introduced to equip the students with knowledge and skill in the design and development of remote sensing application. A particular emphasis will be placed on the use of remote sensing data for various applications such as marine, environment, planning, hydrology, etc. Students will work in small groups to develop a conceptual design and modelling for remote sensing image and will then work individually to build a small project using available remote sensing satellite data as well as data digitized from existing maps, imagery and field data collected using GPS.

**MGHS 1544 Application of Remote Sensing Project Management (Elective)**

This course is designed to introduce and expose the students to the theory and practice of project management. The students are expected to understand and be able to apply the knowledge and skill in handling projects particularly those related to remote sensing applications. The course will cover topics such as project specification, activity and planning. Apart from that, other major topics to be covered are human resource management, effective communication, project maintenance and submission.

## Master of Science (Real Estate)

The Master of Science (Real Estate) course consists of 5 core courses, 4 elective courses and 1 University course. In addition to these subjects students are required to submit a Master Project worth of 6 credits. To graduate, students must complete a total 45 credits and they are assessed through assignments, presentations and final examination. The curriculum of the program as following;

### Name of Award

Master of Science (Real Estate)

### Programme Educational Objectives

### Programme Learning Outcomes

- PO1: Demonstrate mastery of knowledge in the relevant field.
- PO2: Apply practical skills in the relevant field.
- PO3: Relate ideas to the societal issues in the relevant field.
- PO4: Conduct research independently with minimal supervision and adhere to legal, ethical and professional codes of practice.
- PO5: Demonstrate leadership qualities through communicating and working effectively with peers and stakeholders.
- PO6: Generate solutions to problems using scientific and critical thinking skills.
- PO7: Manage information for lifelong learning.

### Mode and Duration of Study

Mode of Study	Full-time
Minimum Duration	1
Maximum Duration	4 years



## Classification of Courses

Classification	Credit Hours	Percentage
1. Programme Core	22	55
2. Programme Electives	8	20
3. Research Project	8	20
4. Compulsory University Course (including Research Methodology)	2	5
<b>Total</b>	<b>40</b>	<b>100</b>

### List of Courses for Master of Science (Real Estate) Programme

Codes	Courses	Credits
<b>UNIVERSITY COURSE (3 CREDITS)</b>		
UHAW 6023	University Subject	3
<b>CORE COURSES (20 CREDITS, COMPULSORY)</b>		
MGHP 1114	Strategic Asset Management	4
MGHP 1124	Real Estate Business and Marketing	4
MGHP 1144	Real Estate Market research	4
MGHP 1134	Corporate Real Estate Asset Management	4
MGHP 1154	Research Methodology	4
<b>ELECTIVE COURSES (CHOOSE FOUR (4) COURSES) (16 CREDITS)</b>		
MGHP 1534	Real Estate Valuation	4
MGHP 1524	Real Estate Investment Analysis	4
MGHP 1514	Strategic Facilities Management	4
MGHP 1544	Real Estate Development	4
<b>MASTER PROJECT (6 CREDITS)</b>		
MGHP 1196	Master Project	6
<b>TOTAL NUMBER OF CREDITS</b>		<b>45</b>



## Syllabus Synopsis

Course Code	Course Name	Synopsis
MGHP 1114	Strategic Asset Management	The purpose of this course is to provide a framework to manage all assets from an organisational perspective. The key focus areas include providing an asset base that matches and supports the business needs, consolidating existing corporate capital assets and optimising asset utilization, meeting statutory compliance obligations; and aligning asset operating costs with business planning and service delivery requirements.
MGHP 1514	Strategic Facilities Management	This course introduces the important strategic elements of facilities management. Topics include facilities management in a strategic framework, the changing business world, facilities management as a business case, quality managed facilities towards a customer focused organisation, business process re-engineering, managing the FM business. Also strategic purchasing for competitive advantage, determining procurement and resourcing strategy and organisational case studies.
MGHP 1124	Real Estate Business and Marketing	This course introduces real estate business and marketing, and is divided into two parts. The first part covers introduction to real estate business and real estate business environment. For the second part, it provides a broad scope and introduces the main aspects of marketing, including marketing planning, management and implementation.
MGHP 1154	Research Methodology	This course enables students to identify and apply appropriate research methodologies in order to plan, conduct and evaluate research in real estate-related fields. This course will enable students to distinguish between scientific methods and common sense knowledge while laying the foundation for research skills at higher levels.
MGHP 1196	Master Project	This course provides opportunity for the students to design and enact an individual research project at the master level, and present it in the form of a master dissertation. The master project forms part of the overall study leading to the award of Real Estate Business. A high standard of achievement will be expected from the students. The project aims to develop intellectual interest among students and to demonstrate their ability for research.



Course Code	Course Name	Synopsis
MGHP 1534	Real Estate Valuation	The course provides a framework for the study of advanced valuation techniques towards an objective methodology of real estate valuation. Review the traditional valuation methods. A discussion of new valuation technology includes financial analysis, statistical model and spatial statistical analysis using geographic information system (GIS).
MGHP 1544	Real Estate Development	Introduction to property development (development theory, process, timing and market), regulations and their effect on property development decisions (government regulations, development control, tax, etc.), property development measurement (property investment, financial measures; financing in real estate investment; property development investment and finance), property development appraisal (cashflow construction and sensitivity analysis, risk analysis and return) and environmental risks in property development
MGHP 1134	Corporate Real Estate Asset Management	This course assesses corporate real estate asset management by examining the role of real estate in corporations. It evaluates real estate management in a strategic manner which offers assistance towards making objective real estate decision-making. This supports value enhancement of corporate real estate assets in order to realign real estate with business strategy.
MGHP 1144	Real Estate Market Research	This course is a continuation of the undergraduate curriculum, focusing on more rigorous approaches to property market research. It comprises basic theories with some similar grounds to the undergraduate level but with additional depth on the analytical elements such as data and analysis methods with more emphasis on the quantitative aspects.
MGHP 1524	Real Estate Investment Analysis	The course provides various aspects of real estate investment analysis. The discussions are mainly on the implications of the financial aspects and investment performance of real estate investment. Real estate investment analysis is one the important components of decision-making exercises as real estate decision would be crucial for any organisation to deal with.

## Master of Science (Land Administration & Development)

The Master of Science (Land Administration and Development) course consists of 5 core courses, 4 elective courses and 1 University course. In addition to these subjects, students are required to submit a Master Project worth of 8 credits. To graduate, students must complete a total 46 credits and they are assessed through assignments, presentations and final examination. The curriculum of the programme is shown.

### Name of Award

Master of Science (Real Estate)

### Programme Educational Objectives

PEO1

### Programme Learning Outcomes

- PO1: Demonstrate in-depth knowledge in the discipline of land administration and development.
- PO2: Demonstrate the skill of identifying the weaknesses of the existing laws and policies and proposing their reform relate ideas to the societal needs in (social, economy and environment).
- PO3: Conduct research independently with minimal supervision and adhere to legal, ethical and professional codes of practice.
- PO4: Demonstrate leadership qualities and communicate and work effectively with peers and stakeholders.
- PO5: Generate solutions to problems using scientific and critical thinking skills in land administration and development.
- PO6: Manage land information effectively and continuously (lifelong learning) within social, economic and environmental aspect.

### Mode and Duration of Study

Mode of Study	Full-time
Minimum Duration	1
Maximum Duration	4 years



List of Courses for Master of Science (Land Administration and Development) Programme

Codes	Courses	Credits
<b>UNIVERSITY COURSE (3 CREDITS)</b>		
UHAW 6023	University Subject	3
<b>CORE COURSES (19 CREDITS, COMPULSORY)</b>		
MGHN 1504	Applied Economics of Property Development	4
MGHN 1514	Land Administration And Land Information System	4
MGHN 1524	Law of Land Development	4
MGHN 2554	Planning and Development	4
MGHN 2523	Research Methodology in LAD	3
<b>ELECTIVE COURSES (CHOOSE FOUR (4) COURSES) (16 CREDITS)</b>		
MGHN 1014	Spatial Data Infrastructure for Land Administration	4
MGHN 2514	Law on Apartment Ownership	4
MGHN 2544	Strategic Land Development and Practices	4
MGHN 2584	Law and Practices Relating to Housing Industry	4
MGHN 2624	Islamic Land Law and Financing	4
MGHN 2634	Environmental and Natural Resource Management	4
<b>MASTER PROJECT (8 CREDITS)</b>		
MGHN 2548	Master Project	8
<b>TOTAL NUMBER OF CREDITS</b>		<b>46</b>

## Syllabus Synopsis

Course Code	Course Name	Synopsis
MGHN 1514	Land Administration and land Information System	This course will introduce land administration systems in the context of sustainable development. The discussions are mainly on concept of land tenure and land registration, salient features of the land registration system, rights to land and record, the benefits and deficiencies in the land registration system, process of land transfer, computer assisted land registration and land law under the Torren System. The course also provides theoretical and practical knowledge and expertise on applying relevant principles of business administration and information technology for the purpose of building a viable land administration organization. A substantial part of the course is dedicated to land information management for land administration systems and spatial data infrastructures.
MGHN 1524	Law of Land Development	This course delivers law and procedure in land development, planning and land use policies. Materials in this course consist various regulations which are National Land Code 1965, Land Acquisition Act 1960 (Act 468), Local Government Act 1976 (Act 171), Town and Planning Act 1976 (Act 172), Uniform Building By-Laws 1984 and other legislations that may be applicable and need to be given attention before any development can be carried out. A substantial part of the course is dedicated to discuss on the others land policies, for example property ownership policies by foreign citizens, low cost housing guidelines, bumiputera quota policy, malay reserve land, native land, waqf land and etc.
MGHN 1504	Applied Economics of Property Development	This course offers an overview on matters relating to aspects of property development procedures and practice. Property development principles and practice is essential for those who are engaged with matters relating to land and the development process. In order to be involved with land development one has to be well equipped with the knowledge on development procedures, its legislation and the practice. Issues on property development have been a major concern locally and worldwide. Some of the property development issues will be discussed and examined throughout the course. The issues include topics of current interest such as the delivery system, development versus environment and changes in the development trends.



Course Code	Course Name	Synopsis
MGHN 2554	Planning and Development	This courses consists an overview on matters relating to aspects of town planning and its relation with development. Planning and development are two inter-related fields, which are essential for those who are engaged with matters relating to land and the development process. In order to be involved with land development one has to be well equipped with the knowledge on planning matters, its legislation and the practice. Issues on planning and development have been a major concern locally and worldwide. Some of the planning issues will be discussed and examined throughout the course. The issues include topics of current interest such as the concept of sustainable development, development versus environment and changes in the development trends.
MGHN 2523	Research Methodology in LAD	In general, research methodology is a set of procedures or methods used to conduct research. The primary purpose of this course is to expose students the principal steps in the process of research. Topics covered in this course include introduction to research, types of research, research problem, literature review, data collection, data analysis and writing research proposal. By the end of this course, students are expected to be able to utilize the knowledge of the research process in a research proposal.
MGHN 2548	Master Project	The course is a research based project of individual interest that relates to land development studies or any current issues on legal, property development, land administration, housing, environment, information technology, or any other relevant topics. The course is aimed to lead the student how to formulate the idea and then represent it in a good manner in the scientific report and the oral presentation. The students should also know how to argue their idea in the examination. With supervision from the supervisors, the students are expected to submit a thesis in accordance with the standard format.
MGHN 2584	Law and Practices Relating to Housing industry	This course offers knowledge on overview on the issues of housing industry particularly on legal and practical aspects. The topics covered consist about housing as an Investment, concept of house ownership and the rules and regulations, policies on home ownership and affordability factor, role of Local Authority, State and Federal, law with regard to housing development, housing delivery system; developers obligation; Purchaser rights and protection; Certificate of Fitness. This course also discuss on the current issues in housing development, for example built then sell versus sell then built concept, conflict on gated and guarded community, debates on affordable housing, service apartment and etc.

Course Code	Course Name	Course Description
MGHN 2624	Islamic Land Law and Financing	This course delivers on Islamic concept of land; The role of the state as e-Trustee; Public and private ownership of the land; The power of the state to alienate; Compulsorily acquire, and forfeit private land and impose taxes; security of individual titles and rights and their transferability and collateralisation; the instruments of transfer and transmission; Financial contracts; Credits-based, joint ventures, securitisation and self-financing. This course also offers on property development financing by using syariah concept. Students will expose on the concept in debt banking; Bai' al-inah (Sale and buy back agreement), Bai' al-Bithaman Ajil (Deferred payment sale), Bai Muajjal, Baihaki Kasi Sallam, Hibah, Ijarah, Mudarabah (Profit loss sharing), Murabahah (Cost Plus), Musawamah, Musyarakah (joint venture), Qard Hassan (Good Loan), Sukuk (Islamic Bond), Takaful (Islamic Insurances), Wadiah (Safe keeping), Wakalah (Agency), Islamic Equity Fund and Islamic Law on trading.
MGHN 2634	Natural Resources and Environmental Management	The course is design to give the awareness on the importance of environment and natural resources. It deals with the economy, the environment and natural resources both nationally and globally. The course main interest is to look on how we best use the available resources by conducting sustainable management. The topics cover on overview of ecosystems and natural resource management, renewable and non-renewable resources such as water, land, soils, air, wildlife, and their vegetative communities; appreciation and understanding of the field of natural resource management, Current human threats, Protection and maintenance of natural resource systems by related agencies and non-government organization, and others initiative, related laws, legislations and conservation. This course also discuss on economic principles and political issues involved in protecting the environment and managing natural resources effectively.
MGHN 2514	Law on Apartment Ownership	This course covers and historical and comparative overview of the institution of apartment ownership; individual and common property; participation quotas for maintenance; establishment of apartment ownership schemes and acquisition of title in a unit; whether the owner of an apartment acquires genuine ownership of the apartment; sanctions to enforce obligations; settlement of disputes; alterations and improvements; development in phases; management and administrations; and terminations of apartment ownership schemes; and the conversion of rental buildings to apartment ownership schemes.



Course Code	Course Name	Course Description
MGHN 1014	Spatial Data Infrastructure For Land Administration	This course is designed to offer students to observe several criteria or principle of Spatial Data Infrastructure such as policies, standards and practices in spatial information industry also land administration information management. The SDI concept continues to evolve as it becomes a core infrastructure supporting economic development, environmental management and social stability in land administration field and practices. At the same time, to explore the institutional and technical issues influencing the development of SDI. It concentrates on the contribution to the theory and practices of SDI, explores practical issues and solution of successful SDI implementation. The student will be equipped with fundamental of Spatial Data Infrastructure land administration practices.
MGHN 2544	Strategic Land Development and Practices	In this course, students will be exposed to the theoretical and practical aspects of identifying thus determining the overall aims or interests of land development as well as the means to achieve them. The topics cover an overview strategic development, Malaysia National Physical Plan, spatial policy, regional development corridor in Malaysia, Iskandar Malaysia and regional policy. By the end of this course, it is expected that students would be able to describe the philosophy of land development and the practices adopted in current practice as tools for strategic land development.



## Master of Assets and Facilities Management

The Master of Assets and Facilities Management course consists of 5 core courses, 5 elective courses and 1 University course. In addition to these subjects, students are required to submit a Master Project worth of 8 credits. To graduate, students must complete a total 46 credits and they are assessed through assignments, presentations and final examination. The curriculum of the program is shown as following.

### Name of Award

Master of Assets and Facilities Management

### Program Educational Outcomes

- PEO1 Demonstrate mastery of knowledge in the asset and facilities management
- PEO2 Apply practical skills in the asset and facilities management
- PEO3 Relate ideas to the societal issues in the asset and facilities management
- PEO4 Conduct research independently with minimal supervision and adhere to legal, ethical and professional codes of practice.
- PEO5 Demonstrate leadership qualities through communicating and working effectively with peers and stakeholders.
- PEO6 Generate solutions to problems using scientific and critical thinking skills.
- PEO7 Manage information for lifelong learning.

### Program Learning Outcomes

- PO1 Able to use knowledge of undergraduate engineering and other disciplines to identify, formulate and solve problem in advanced Facilities Management.
- PO2 Able to conduct research and development activities guided/directed systematically in the field of Facilities Management.
- PO3 Build awareness and understanding of professional ethical impact of engineering solution in a global and societal context.



- PO4 Able to promote and disseminate research based knowledge and development activities in Facilities Management through peer review and publication.
- PO5 Know how and resources required to transfer technology to the commercialization and clinical implementation.
- PO6 Aware of the need and ability to lifelong learning.

## Mode and Duration of Study

Mode of Study	Full-time
Minimum Duration	1 year
Maximum Duration	4 years

List of Courses for Master of Assets and Facilities Management Programme

Codes	Courses	Credits
<b>UNIVERSITY COURSE (3 CREDITS)</b>		
UHAW 6023	University Subject	3
<b>CORE COURSES (20 CREDITS, COMPULSORY)</b>		
MGHT 1114	Strategic Asset Management	4
MGHT 1124	Strategic Facilities Management	4
MGHT 1134	Project & Contract Management	4
MGHT 1144	Strategic Maintenance Management	4
MGHT 1154	Research Methodology in FM	4
<b>ELECTIVE COURSES (CHOOSE FIVE (5) COURSES) (15 CREDITS)</b>		
MGHT 1513	Financial Management/ Risk Management	3
MGHT 1523	Quality Management /Value Management	3
MGHT 1533	Facilities Information Technology Solutions/ Sustainable Environmental Management (FITS/SEM)	3
MGHT 1543	Performance Management	3
MGHT 1553	Professional Practice	3
<b>MASTER PROJECT (8 CREDITS)</b>		
MGHT 1168	Master Project	8
<b>TOTAL NUMBER OF CREDITS</b>		<b>46</b>

## Master of Philosophy

**Built Environment** - Transportation Planning (MBEJA3AJA), Architecture (MBESA3AJA), Urban & Regional Planning (MBEWA3AJA), Quantity Surveying (MBEUA3AJA), and Landscape Architecture (MBELA3AJA).

### Introduction

The Master of Philosophy programmes offered by the Faculty is in the field of architecture, quantity surveying, urban and regional planning, transportation planning and landscape architecture. The programmes are entirely conducted in research mode whereby students conduct original research under the supervision of experienced supervisors.

### Name of Award

Master of Philosophy

### Programme Educational Objectives

- PEO1 Demonstrate an understanding of the theories, principles, scope and roles of the built environment (urban and regional planning, quantity surveying, architecture and transport planning) in the process of growth and development.
- PEO2 Apply a range of analytical skills and techniques designed to address a range of complex problems.
- PEO3 Apply the knowledge, skills and understanding for the achievement of feasible solutions to the built environment problems.
- PEO4 Work in multi-disciplinary team and contribute to the society.
- PEO5 Comply with ethics, professional and community standards, and involve in life-long learning.

### Programme Learning Outcomes

- PO1 Demonstrate mastery in principles and practices in the field of the built environment at local, strategic, national and international levels.
- PO2 Demonstrate skills in applying methods and techniques across a variety of context and practice in the field of the built environment.
- PO3 Demonstrate the capability to relate ideas and solutions to diverse problems and issues in the field of the built environment.
- PO4 Demonstrate research capabilities in the field of the built environment with minimal supervision and adhere to legal, ethical and professional codes of practice.
- PO5 Demonstrate leadership qualities through effective communication and team working with peers and stakeholders to overcome diverse challenges within the field of the built environment.
- PO6 Demonstrate critical thinking and scientific approach to effectively overcome issues and challenges in the field of the built environment.

## Mode and Duration of Study

Mode of Study	Full-time
Minimum Duration	1 ½ years
Maximum Duration	4 Years

## Classification of Courses

Classification	Credit Hours	Percentage
1. University		
a. General	3	100
b. Research Methodology	3	
2. Dissertation	-	0
<b>Total</b>	<b>6</b>	<b>100</b>

## Award Requirements

For the award of Master of Philosophy the students should pass all courses including the completion of Dissertation.

## List of Courses According to Semester

### Semester 1

Courses	Credit	Total Credit
1. MBEM1113 Research Methodology	3	0
2. MBEX1100 Dissertation	(HW) <sup>1</sup>	

Note: <sup>1</sup>Compulsory Audit Course

### Semester 2

Courses	Credit	Total Credit
1. MBEX1200 Dissertation	(HW) <sup>1</sup>	3
2. UXXXxxx3 University General Course <sup>2</sup>	3	

Note: <sup>1</sup>Compulsory Audit Course

<sup>2</sup>Students are advised to enrol for the course in the earlier semester.

## Areas of Research

Students in the Master of Philosophy programmes conduct research in a variety of areas of interest listed below.

### Architecture

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

### Landscape Architecture

- Landscape Architecture
- Urban Greening
- Urban Landscape Design
- Landscape Resource Planning
- Landscape Ecology & Urban ecology
- Green Technology
- Children's Environment
- Landscape and Climate Research
- Historical and Heritage Landscape
- Cultural Landscape
- Landscape Professional Practice
- Community Landscape Planning
- Environmental Psychology
- Landscape Visualisation
- Landscape Assessment
- Islamic Built Environment & Islamic Studies

### Quantity Surveying

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

### **Urban and Regional Planning**

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

### **Transport Planning**

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

## Syllabus Synopsis

### **MBEM1113 Research Methodology**

This course equips the students with the theory and practice of conducting an academic research. The course covers the theory and philosophy of research, research methods, research methodology, research design, purpose of research, types or classification of research, research process and research writing. The students is expected to prepare the proposal for their dissertation.

### **MBES1100 – 6200; MBEW1100 – 6200; MBEJ1100 – 6200; MBEU 1100 – 6200; MBEL1100 – 6200 Dissertation (HW Compulsory Audit Course)**

Students are expected to conduct an academic research on the related field based on the proposal submitted and approved as per scheduled. It requires individual students to undertake investigative studies which involve an identification of problems/issues; literature review; data collection, analysis and interpretation of research findings. Dissertation shall contribute to the related body of knowledge. The students shall be required to submit and defence their dissertation.

## Master of Philosophy

**(Geoinformation and Real Estate)** - Remote Sensing (MGHSA3AJA), Geoinformatics (MGHGA3AJA), Facilities Management (MGHFA3AJA), Land Administration & Development (MGHNA3AJA), Real Estate (MGHPA3AJA), Geomatics Engineering (MGHUA3AJA) dan Hydrography (MGHHA3AJA)

## Introduction

The Master of Philosophy programmes offered by the Faculty is in the field of geoinformation and real estate. The programmes are entirely conducted in research mode whereby students conduct original research under the supervision of experienced supervisors.

## Name of Award

Master of Philosophy

## Mode and Duration of Study

Mode of Study	Full-time
Minimum Duration	1 Year
Maximum Duration	4 Years

## Classification of Courses

Classification	Credit Hours	Percentage
1. University		
b. General	3	100
b. Research Methodology	3	
2. Dissertation	-	0
<b>Total</b>	<b>6</b>	<b>100</b>

## Award Requirements

For the award of Master of Philosophy the students should pass all courses including the completion of Dissertation.



## List of Courses According to Semester

### Semester 1

Courses	Credit	Total Credit
1. MBEM1113 Research Methodology	3	0
2. MGH...1100 Dissertation	(HW) <sup>1</sup>	

Note: <sup>1</sup>Compulsory Audit Course

### Semester 2

Courses	Credit	Total Credit
1. MGH...1200 Dissertation	(HW) <sup>1</sup>	3
2. UXXXxxx3 University General Course <sup>2</sup>	3	

Note: <sup>1</sup>Compulsory Audit Course

<sup>2</sup>Students are advised to enrol for the course in the earlier semester.

## Areas of Research

Students in the Master of Philosophy programmes conduct research in a variety of areas of interest listed below.

- Geomatics Engineering (MGHUA3AJA)
- Geoinformatics (MGHGA3AJA)
- Remote Sensing (MGHSA3AJA)
- Hydrography (MGHHA3AJA)
- Real Estate (MGHPA3AJA)
- Land Administration and Development (MGHNA3AJA)
- Facilities Management (MGHTA3AJA)



## Syllabus Synopsis

### **MBEM1113 Research Methodology**

This course equips the students with the theory and practice of conducting an academic research. The course covers the theory and philosophy of research, research methodology, research design, purpose of research, types or classification of research, research process and research writing. The students is expected to prepare the proposal for their dissertation.

**MGHU 1100 – 6200; MGHH1100 – 6200; MGHS 1100 – 6200 ; MGHG 1100 – 6200, MGHP 1100 – 6200; MGHN 1100 –6200; MGHS 1100 – 6200; and MGHT 1100 – 6200 Dissertation (HW Compulsory Audit Course)**

Students are expected to conduct an academic research on the related field based on the proposal submitted and approved as per scheduled. It requires individual students to undertake investigative studies which involve an identification of problems/issues; literature review; data collection, analysis and interpretation of research findings. Dissertation shall contribute to the related body of knowledge. The students shall be required to submit and defence their dissertation.

## Doctorate Programmes

(Built Environment –PBE...)

### Introduction

The doctorate programmes offered by the faculty are in the field of architecture, quantity surveying, urban and regional planning, transportation planning, and landscape architecture. The programmes are entirely conducted in research mode whereby students conduct original research under the supervision of experienced supervisors who are themselves PhD holders.

### Name of Award

Doctor of Philosophy

### Programme Educational Objectives

- PEO1 To produce PhD graduates who are experts in their related fields and are able to work independently with supervision from highly qualified supervisors;
- PEO2 To produce PhD graduates who are very knowledgeable and theoretically sound and are able to apply these for the analysis and solution of problems where these leads to new or substantially improved insights and performances;
- PEO3 To produce PhD graduates who can think critically and creatively thus capable of generating and developing new knowledge, products, materials or methods for the benefits of mankind;
- PEO4 To produce PhD graduates with excellent communication skills, capable of communicating effectively both technically and theoretically in various context and with various related parties, thus sharing new knowledge with other researchers from other institutions, universities and also industrialists;
- PEO5 To produce PhD graduates with high integrity and who are ethically professional.

### Programme Learning Outcomes

- PO1 Synthesis knowledge and contribute to original research that broadens the frontier of knowledge in the field of built environment.
- PO2 Adapt practical skills leading to innovative ideas in the field of built environment.
- PO3 Provide expert advice to society in the field of built environment.
- PO4 Conduct research independently and adhere to legal, ethical and professional codes of practice.
- PO5 Display leadership qualities through communicating and working effectively with peers and stakeholders.
- PO6 Appraise problems in the field of built environment critically using scientific skills. Integrate information for lifelong learning.



## Mode and Duration of Study

Mode of Study	Full-time
Minimum Duration	3 Years
Maximum Duration	8 Years

## Classification of Courses

Classification	Credit Hours	Percentage
1. University		
c. General	3	100
b. Research Methodology	3	
2. Thesis	-	0
<b>Total</b>	<b>6</b>	<b>100</b>

## Award Requirements

For the award of Doctor of Philosophy, the students should achieve a total minimum of 6 credit hours, including the completion of Doctoral Thesis.

## List of Courses According to Semester

### Semester 1

Courses	Credit	Total Credit
1. PBEM1113 Research Methodology	3	3
2. PBEX1100 Thesis	(HW) <sup>1</sup>	

Note: <sup>1</sup>Compulsory Audit Course.

### Semester 2

Courses	Credit	Total Credit
1. PBEX1200 Thesis	(HW) <sup>1</sup>	3
2. UXXXxxx3 University General Course <sup>2</sup>	3	

Note: <sup>1</sup>Compulsory Audit Course.

<sup>2</sup>Students are advised to enrol for the course in the earlier semester.

### Semester 3

Course	Credit	Total Credit
1. PBEX2100 Thesis	(HW) <sup>1</sup>	-

Note: <sup>1</sup>Compulsory Audit Course.

### Semester 4

Course	Credit	Total Credit
1. PBEX2200 Thesis	(HW) <sup>1</sup>	-

Note: <sup>1</sup>Compulsory Audit Course.



## Areas of Research

Students in the PhD programmes conduct research in a variety of areas of interest listed below.

### Architecture

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

### Landscape Architecture

- Landscape Architecture
- Urban Greening
- Urban Landscape Design
- Landscape Resource Planning
- Landscape Ecology & Urban ecology
- Green Technology
- Children's Environment
- Landscape and Climate Research
- Historical and Heritage Landscape
- Cultural Landscape
- Landscape Professional Practice
- Community Landscape Planning
- Environmental Psychology
- Landscape Visualisation
- Landscape Assessment
- Islamic Built Environment & Islamic Studies

### Quantity Surveying

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

### **Urban and Regional Planning**

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

### **Transport Planning**

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

## Doctorate Programmes

(Geinformation and Real Estate – PGH))

### Introduction

The doctorate programmes offered by the faculty are in the field of Geinformation and Real Estate. The programmes are entirely conducted in research mode whereby students conduct original research under the supervision of experienced supervisors who are themselves PhD holders.

### Name of Award

Doctor of Philosophy

Students enrol in the programme are compulsory to present their research proposal in semester 3. The proposal will be evaluated by two internal panels that will be appointed by the FGRE postgraduate academic task force. In order to graduate, students are required to prepare complete thesis by following the UTM Thesis Writing Guidelines. The viva voice session will be held at School of Postgraduate Studies UTM. Students enrol in the programme are encourage to publish in international refereed journals as evidences to the originality of their PhD research work.

### Mode and Duration of Study

Mode of Study	Full-time
Minimum Duration	3 Years
Maximum Duration	8 Years

### Classification of Courses

Classification	Credit Hours	Percentage
1. University		
d. General	3	100
b. Research Methodology	3	
2. Thesis	-	0
<b>Total</b>	<b>6</b>	<b>100</b>



## Award Requirements

For the award of Doctor of Philosophy, the students should achieve a total minimum of 6 credit hours, including the completion of Doctoral Thesis.

### List of Courses According to Semester

#### Semester 1

Courses	Credit	Total Credit
1. PBEM1113 Research Methodology	3	3
2. PGH...1100 Thesis	(HW) <sup>1</sup>	

Note: <sup>1</sup>Compulsory Audit Course.

#### Semester 2

Courses	Credit	Total Credit
1. PGH...1200 Thesis	(HW) <sup>1</sup>	3
2. UXXXxxx3 University General Course <sup>2</sup>	3	

Note: <sup>1</sup>Compulsory Audit Course.

<sup>2</sup>Students are advised to enrol for the course in the earlier semester.

#### Semester 3

Course	Credit	Total Credit
1. PGH...100 Thesis	(HW) <sup>1</sup>	-

Note: <sup>1</sup>Compulsory Audit Course.

#### Semester 4

Course	Credit	Total Credit
1. PGH...2200 Thesis	(HW) <sup>1</sup>	-

Note: <sup>1</sup>Compulsory Audit Course.

## Areas of Research

Students in the PhD programmes conduct research in a variety of areas of interest listed below.

### Geoinformation and Real Estate

- Geomatics Engineering
- Geoinformatics
- Remote Sensing
- Hydrography
- Real Estate
- Land Administration and
- DevelopmentFacilities Management

## Syllabus Synopses

### PBEM1113 Research Methodology

This course equips the students with the theory and practice of conducting an academic research. The course covers the theory and philosophy of research, research methods, research methodology, research design, purpose of research, types or classification of research, research process and research writing. The students is expected to prepare the proposal for their thesis.

### PGHU.1100 – 6200; PGHS1100 – 6200; PGHU1100 – 6200; PGHT 1100 – 6200 , PGHN1100 – 6200, PGHP1100 – PGHP, Thesis

Students are expected to conduct an academic research on the related field based on the proposal submitted and approved as per scheduled. It requires individual students to undertake investigative studies which involve an identification of problems/issues; literature review; data collection, analysis and interpretation of research findings. Thesis shall contribute to the related body of knowledge. The students shall be required to submit and defence their thesis.

## Grading and Point Value System for Postgraduate Programmes

### 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 master programme in taught course mode is set by the Faculty upon the Senate's approval. The minimum passing grade is B-.

Students will be graded for most of the courses according to the above grading system. However, there are some courses, particularly compulsory audit course which 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 for Master Programmes in Taught Course Mode

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 > 3.00	Good Standing (KB)
$2.67 \leq \text{CGPA} < 3.00$	Probationary Standing (KS)
CGPA < 2.67	Failure Standing/Academic Dismissal (KG)
<b>For graduation CGPA <math>\geq 3.00</math></b>	

## GPA/CGPA Computation (For Thought Course Mode)

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 Points			60.32
Total credit units from graded courses	20				
Less credit units of failed Course (Course E)	2				
Total credit units earned for the semester	21				

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

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

$$= 3.02$$

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

*\*This Academic Guidebook is valid subject to new updates.*

## Academic Standing for Postgraduate Research Program

Research students are required to complete the online Research Progress Report at the end of every regular semester and will be evaluated by their supervisors.

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

Status	Academic Standing
MM	Good Standing (KB)
TM	Probationary Standing (KS)
KG	Failure Standing/Academic Dismissal (KG)

A student will be dismissed from the academic programme if obtained Failure Standing (KG).

A student with Probationary Standing (KS) for two consecutive semesters will be given Failure Standing (KG) and will be dismissed from the academic programme.

Research students are also required to complete Research Methodology course and University's course for graduation.

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