

Building Engineering Technology

School of Housing, Building, & Planning



CPM 2026
QS 2025
IA 2026
Archi 2025
BEST 2026
BS 2025
URP 2026



Bachelor of Building Engineering Technology with Honours



**SCHOOL OF
HOUSING,
BUILDING &
PLANNING**

Ranked TOP 5
among
Public Universities

& TOP 100
faculty in the
world by subject

Editors

Dr. Radzi Ismail
Dr. Ariza Sharikin Abu Bakar
Dr. Muhammad Hafeez Abdul Nasir
Dr Nor Zarifah Maliki

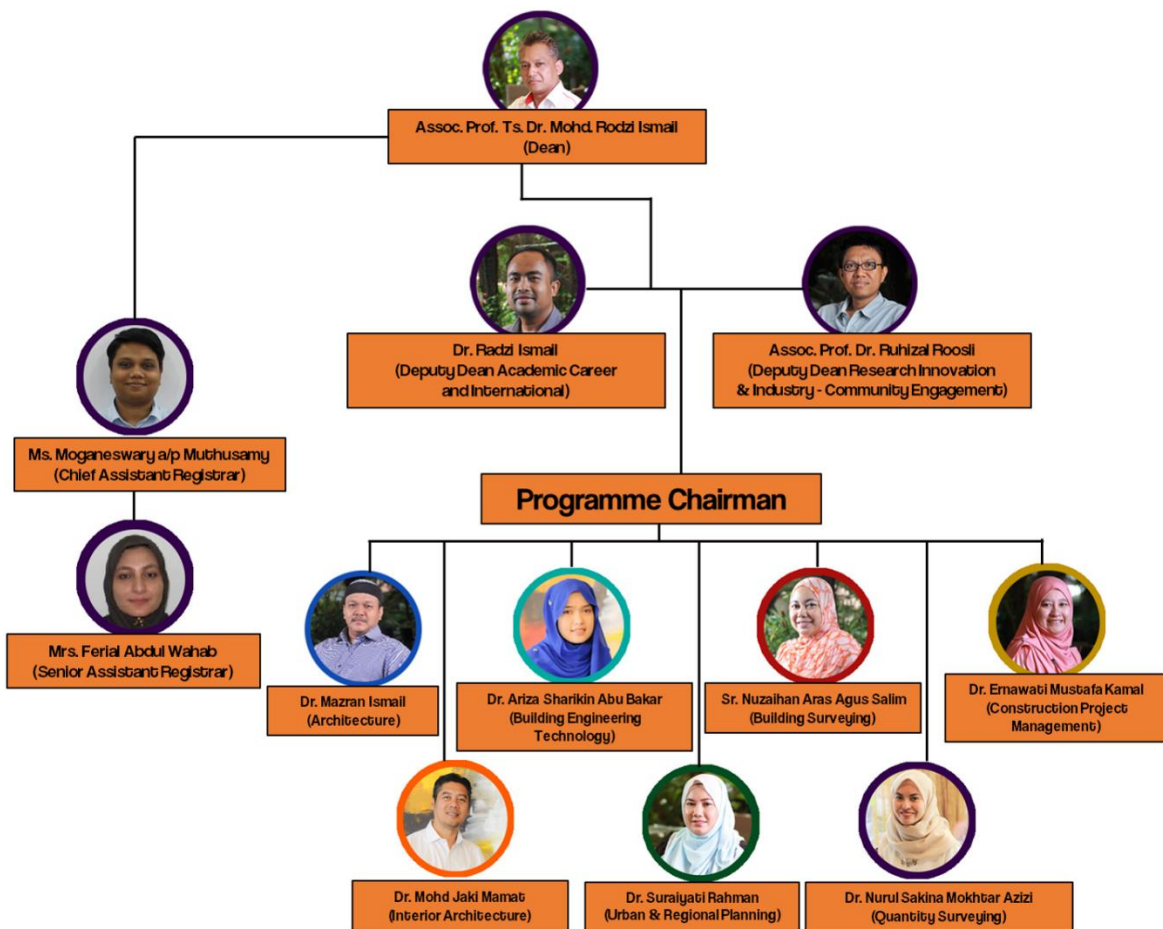
Advisors

Assoc. Prof. Ts. Dr. Mohd. Rodzi Ismail
Prof. Dato' Gs. Dr. Narimah Samat (TNCAA)

Sponsor

Bahagian Akademik dan Antarabangsa USM (BAA)





Academic Staff



Mohd Rodzi Ismail
(Assoc. Prof. Ts. Dr.)
E49 Room 211
+604 - 653 2841



Ariza Sharikin Abu Bakar (Dr.)
E49 Room 105
+604 - 653 2805



Hanizam Awang
(Assoc. Prof. Dr.)
E08 Room 006
+604 - 653 3279



Cheah Chee Ban
(Assoc. Prof. Ir. Dr.)
E49 Room 102
+604 - 653 2827



Abdul Naser Abdul Ghani
(Assoc. Prof. Ir. Dr.)
E49 Room 104
+604 - 653 2804



Noor Faisal Abas
(Assoc. Prof. Ts. Dr.)
E08B Room 007
+604 - 653 3170



Faizal Baharum (Dr.)
E40 Room 115
+604 - 653 2501



Mariati Taib @ Mohd Taib (Dr.)
E49 Room 210
604 - 653 5953



Norhidayah Md Ulang (Dr.)
E49 Room 209
+604 - 653 2839



Noor Halizah Abdullah
(Ts. Dr.)
Cabin C, Room 1
+604-6535942

School of Housing, Building & Planning

The School of Housing, Building and Planning (HBP), Universiti Sains Malaysia (USM) was established in 1972 with the aim of nurturing skilled graduates who are capable of becoming leaders in implementing relevant planning, design and development processes necessary for a sustainable built environment in Malaysia and the world.

After almost five decades, the school has made tremendous progress in teaching and learning, research and publication, consultancy and innovation, and continuously making positive impact on the society and the industry.

Currently, seven undergraduate programmes are offered by the school. The programmes are recognized by the respective professional bodies such as the Board of Town Planners Malaysia (LPBM), Board of Architects Malaysia (LAM), Board of Quantity Surveyors Malaysia (BQSM), Royal Institute of Chartered Surveyors (RICS), Pacific Association of Quantity Surveyors (PAQS), Royal Institute of Chartered Surveyors Malaysia (RICSM), The Chartered Institute of Building (CIOB), and Chartered Association of Building Engineers (CABE).

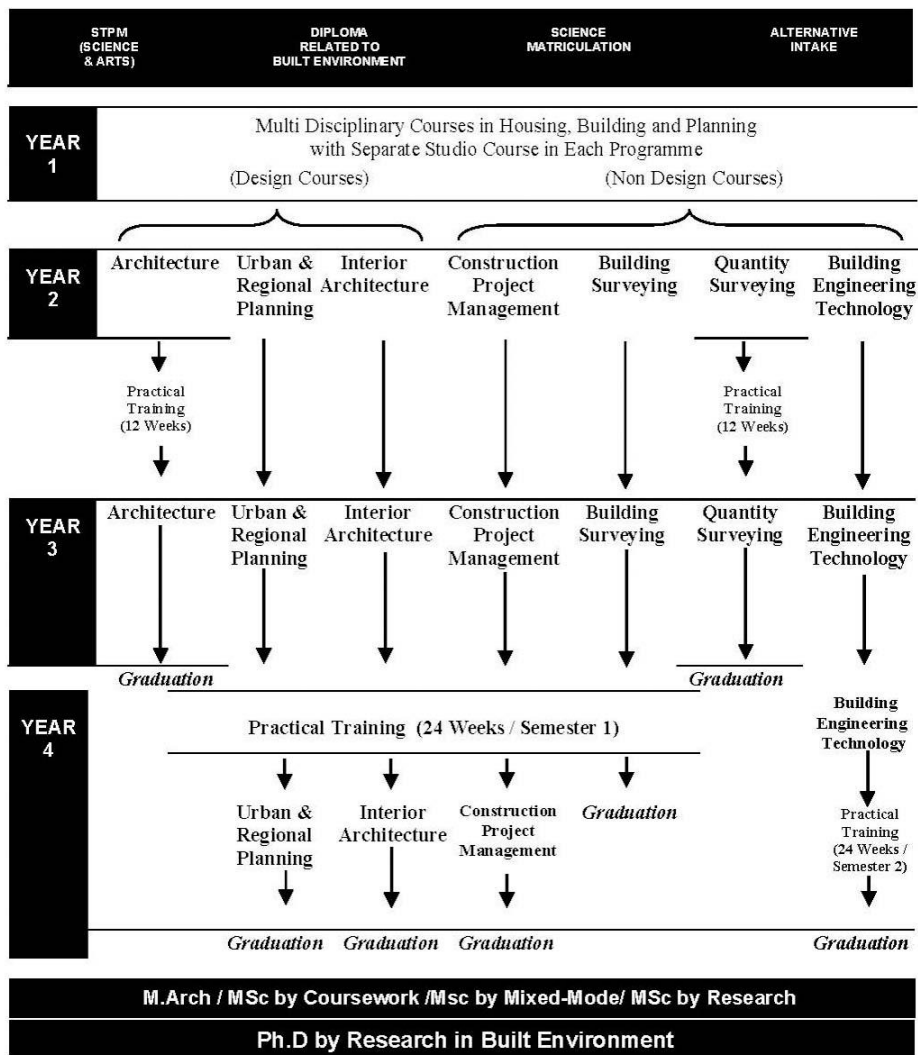
Mission

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

‘Championing a sustainable tomorrow through holistic education and upholding a global mindset’



Study Path at The School of HBP



Programme Structure/Curriculum at HBP

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

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

R	U	S	1	0	0
					Courses in Series
				00-	Studio
				10-	Workshop/Laboratories
				20-	Physical Environment Studies
				30-	Theory and Methodology
				40-	Cultural & Etiquette Studies
				50-	Management, administration & regulation
				60-	Science and Technology
				70-	Research and Practical
					Course Level
					Course Implementation
				S =	Studio
				B =	Workshop/Laboratories
				K =	Lecture only
				G =	Combination of lectures and practicals
				T =	Combination of lectures & tutorial/seminar
				L =	Research
					Course Classification:
				U =	General
				A =	Architecture
				P =	Urban & Regional Planning
				M =	Construction Project Management
				D =	Interior Architecture
				E =	Building Engineering Technology
				Q =	Quantity Surveying
				B =	Building Surveying

R - Code for the School of Housing, Building and Planning

2.0 Program Requirements

2.1 Courses

The requirements for students in Building Engineering Technology programme are summarised as follows:

(A) Core Courses

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

(B) Elective Courses

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

(C) Practical Training Course

All Building Engineering Technology students are required to undergo an Industrial Training for a period of 24 weeks (6 months) in Year Four Semester 2. Practical training carries 12 units.

2.2 Unit Requirements

Unit requirement for graduation is as follows:-

Bachelor of BUILDING ENGINEERING TECHNOLOGY with Honours	
Course Components	Units
Core Courses	98
Elective Courses	27
University Courses	15
Total	140

2.3 Course Duration

Bachelor of BUILDING ENGINEERING TECHNOLOGY with Honours	
Duration	
Minimum semesters	8 semesters (4 years)
Maximum semesters	14 semesters (7 years)



For Core and Elective Courses:

- Grade F (Fail) will be required to repeat the course.
- Grade D- and above is considered as a passing grade (Pass)

For Studio Courses under the Core Courses:

- Grade of C and above is considered as a passing grade (except for Architecture Studio Courses which the passing grade is B-). Students obtaining grade C- (C+ for Architecture Studio Courses) and below will be required to repeat the course.

Repeat Courses:

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

2.4 Studio Courses

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

STUDIO FOR BUILDING ENGINEERING TECHNOLOGY (42 Units)

Code	Title
RES 103/7	- Building Engineering Technology Studio 1
RES 104/7	- Building Engineering Technology Studio 2
RES 203/7	- Material and Structural System Studio
RES 204/7	- Engineering Services and Environmental Technology Studio
RES 301/7	- Infrastructure, Energy and Transportation Studio
RES 302/7	- Computer Aided Design and Information Modelling Studio

3.0 List of Courses

3.1 Building Engineering Technology Programme

A. Core Courses (98 Units)

Code and Title			Unit	Semester	Year	TICK ✓
RES 103	-	Building Engineering Technology Studio 1	7	1	1	
REG 131	-	Mathematic for Engineering Technology	3	1	1	
REG 132	-	Structural Mechanics	3	1	1	

RES 104	-	Building Engineering Technology Studio 2	3	1	1	
REG 161	-	Construction Materials	3	1	1	
RMK255	-	Law and Practice of Construction Project Management 1	3	2	2	
RES 203	-	Material and Structural System Studio	7	1	2	
REG 266	-	Structural Analysis	3	1	2	
REG 265	-	Infrastructure Technology	3	1	2	
REG 233	-	Geomatic Technology	7	1	2	
RES 204	-	Engineering Services and Environmental Technology Studio	7	2	2	
REG 261	-	Building Services	3	2	2	
RES 301	-	Infrastructure, Energy and Transportation Studio	7	1	3	
REG 371	-	Design of Concrete Structures	3	1	3	
REG 361	-	Methods of Construction	3	1	3	
RES 302	-	Computer Aided Design and Information Modelling Studio	7	2	3	
REL 300	-	Building Engineering Technology Studies 1	3	2	3	
REG 360	-	Industrialised Building System (IBS)	3	2	3	
REG 468	-	Road and Transportation	3	1	3	
REG 469	-	Professional Practice for Engineering Technologist	3	1	3	
REL 400	-	Building Engineering Technology Studies 2	5	1	3	
REL 471	-	Industrial Training	12	2	4	

B. Elective Courses (27 Units)

Code and Title			Unit	Semester	Year	TICK ✓
RMK153*	-	Principles of Construction Economics	3	1	1	
RMK156*	-	Health, Safety and Environmental Management	3	1	1	
RQG 236*	-	Measurement 1	3	2	2	
RQG 237	-	Measurement 2	3	1	2	
RMK233*	-	Measurement of Building Works	3	2	2	
RMK252*	-	Principles of Project Management	3	2	2	
RMK234	-	Building Cost Estimation and Pricing	3	1	2	
RMK255*	-	Law and Practice of Construction Project Management 1	3	2	2	
RMK264*	-	Construction and Financial Management	3	2	2	

RQG355*	-	Management, Sustainability and Internationalisation	3	2	3	
RBG351*	-	Building Maintenance	3	1	3	

* *Recommended courses*

4.0 University Course Requirements

General Studies (MPU)		CREDIT TOTAL	
		Local Students	International Students
U1	<u>Local Students</u> <ul style="list-style-type: none"> HFF225 (Philosophy and Current Issues) (2 credits) HFE224 (Appreciation of Ethics and Civilisations) (2 credits) LKM400 (Bahasa Malaysia IV) (2 credits) <u>International Students of Science and Technology</u> <ul style="list-style-type: none"> HFF225 (Philosophy and Current Issues) (2 credits) LKM100 (Bahasa Malaysia I) (2 credits) 	6	4
U2 Or U3	<u>Local Students</u> <ul style="list-style-type: none"> WUS101 (Core Entrepreneurship) (2 credits) English Language Courses (4 credits) <u>International Students</u> <ul style="list-style-type: none"> SEA205E (Malaysian Studies) (4 credits) English Language Courses (4 credits) 	6	8
U4	Co-curricular courses*	2	2
Options	Skill courses/Foreign Language Courses/ Other courses offered by other schools. Students have to choose any of the following: <ul style="list-style-type: none"> Co-curricular courses Skill courses/Foreign Language Courses/ Other courses offered by other schools 	1	1
	CREDIT TOTAL	15	15

5.0 Course Synopsis

5.1 Core Courses

RES 103 – Building Engineering Technology Studio 1

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

Learning Outcomes

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

- (i) Explore and identify the roles of the actors in the built environment
- (ii) Identify the flow of development process flow
- (iii) Explain and apply basic technical drawing
- (iv) Explain the use of materials and building components, structural elements, building infrastructure and services
- (v) To implement systematically-formulated drawings in groups and formulate holistic learning outcomes through individual portfolio preparation

RES 104 – Building Engineering Technology Studio 2

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

Learning Outcomes

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

1. Identify the key components of a project development process
2. Carry out market research and site analysis in groups
3. Recommends concept plans and master plans in line with project requirements
4. Reporting components of site coordination and management

REG 131 – Mathematics For Engineering Technology

This course is about the mathematics that is most widely used in engineering core subjects such as algebra, calculus, statistic and statistical application. Topics covered include matrices, polynomials, application of the derivation, first order differential equations, statistic and applied statistic

Learning Outcomes

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

- (i) understanding basic knowledge concepts, theories and mathematical techniques on engineering technology issues
- (ii) determine mathematical methods to solve mathematical and statistical issues
- (iii) demonstrate the mathematical problem solving according to the appropriate theory.

REG 132 –Structural Mechanics

This course introduces students to the principles required to solve engineering mechanics problems with emphasis on the commonly encountered issues in building and infrastructure engineering applications. The aim is to cultivate engineering and technology students with the ability to comprehend and analyze problems associated to engineering mechanics in a simple and logical manner. Course content includes forces and equilibrium of particles, equilibrium of rigid bodies, equivalent systems of forces, centroids and center of gravity, analysis of structural components such as trusses, beam and cables; friction and

moment of inertia. The course not only focuses on solving conceptual components related to engineering applications but also emphasis on practical real worlds industry oriented building engineering and technology problems.

Learning Outcomes

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

- (i) Understand the basic concept of vector and forces and the behavior of the determinate structure
- (ii) Solve statically determinate structures using basic principle and appropriate method

REG 161 – Construction Materials

This course equipped students with knowledge on building materials in construction industry. Major materials covered in the course include concrete, stone, brick masonry, glass, steel, wood and composite materials. It emphasizes on the basic physical properties of the material, ways in which it came to be used for building construction, and current developments to enhance or vary its physical properties. The course also introduces fundamental of testing and standard requirements topics for building materials. Emphasis will be given to specific industrial standard related to the construction industry namely Malaysian Standard MS 523 and Construction Industry Standard CIS 21 in order to give in depth knowledge related to common material in the construction industry.

Learning Outcomes

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

- (i) Identify the characteristics and classification of building materials
- (ii) Explain the required laboratory testing and standards for construction material
- (iii) Propose the suitable construction materials for sustainable construction

RES 203 - Material and Structural System Studio

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

Learning Outcomes

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

- (i) Describe the characteristics of building materials, land and structures.
- (ii) Propose and determine test methods for building materials, soils and structures according to code of practice
- (iii) Demonstrate the laboratory experiments in group to produce technical reports

RES 204 - Engineering Services and Environmental Technology Studio

This course exposes the students to the basic facilities and services that are needed in buildings. Emphasis would be given towards the indoor environmental quality (IEQ), focusing on the indoor thermal comfort and indoor air quality (IAQ). Energy efficiency in buildings would be another focus of this course in which students would be conducting an energy use analysis through the energy auditing exercise.

Learning Outcomes

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

- (i) Elaborate the principles of each components of basic facilities needed in a building.
- (ii) Manipulate theories and techniques in designing services systems in buildings.
- (iii) Apply knowledge in the field of energy efficiency in everyday life and work.

REG 233 – Geomatic Technology

This course covers the basic principles of land surveying works including exploratory survey, levelling survey, traverse survey, theodolite survey, compass survey and tacheometric survey. Contour

survey, contour development, determination of volumes in cut and fills works and also construction site survey will be taught. Besides, students will be exposed to fundamental of GPS, control and monitoring survey and latest GIS technology related to land surveying

Learning Outcomes

At the end of the course students will be able to

- (i) Explain in detail the techniques used in site measurement in land survey work.
- (ii) Apply site measurement skills with land survey instrumentation and conduct site measurement work as a team.
- (iii) Evaluate and analyze data collected from site measurement work and identify the use of the work output for various applications in the field of construction in a critical manner.

REG 261 - Building Services

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

Learning Outcomes

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

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

REG 265 - Infrastructure Technology

This course focuses on the components of physical infrastructures that support the development of a nation. The examples of physical infrastructures

are roads, power supplies, drainage and sewerage system. Students will be exposed to the principles, components and the knowledge to design the infrastructure system. This course also discusses the technology being applied to develop such infrastructure for the country by providing actual examples from the existing infrastructure and mega infrastructure projects in this country and overseas.

Learning Outcomes

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

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

REG 266 - Structural Analysis

This course study view at various types of indeterminate structures in building and civil engineering work with emphasis on structures such as continuous beams and low / medium frames. It also study using various methods to solve the indeterminate structures such as Moment Distribution method, Conjugate beam and Integration method.

Learning Outcomes

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

- (i) Interpret knowledge of non-structural structures based on the degree of uncertainty and surplus force
- (ii) Connect using the latest techniques, and the engineering principles to solve the problem of analysis and design system of beams and building frames.
- (iii) Propose multi-structural troubleshooting using the moment distribution principles

RES 301 - Infrastructure, Energy and Transportation Studio

This is the first part of final year Building Technology studio. It will focus on the practical aspect of land and

project development. It is divided into three (3) major components:

- i. Land/project development practice –
 - Planning, design and approval of projects.
 - Project and construction team.
 - Knowledge of surveying instruments and construction surveying.
- ii. Infrastructure provision in actual development projects according to local authority and utility providers and design drawings categories:
 - Earthworks/Temporary works/Erosion and Sediment Control Plan (ESCP)
 - Road and Drainage
 - Water Supply
 - Sewerage
 - Power supply/telecommunication/fire/security/M&E/internal services
- iii. Green / Renewable energy
 - Generation/Conservation/Maintenance
 - Types of green energy

Learning Outcomes

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

- (i) Read and translate the technical drawings and development plans
- (ii) Apply GIS for infrastructure planning and construction proposal
- (iii) Explain the work flow of infrastructure construction in the proposed development and professional practice of building engineering
- (iv) Propose and design the energy efficiency systems in the building

RES 302 - Computer Aided Design and Information Modelling Studio

Engineering Drawing and Computer Aid Drafting (CAD) and Building Information Modelling module is ideally suited for building engineering technology students, to be able to have advance guide to analyze and augment their designs. This module is organized to take into account advancements in computer aided designs and Building Information Modeling (BIM), and

to keep up with Malaysian along with International Standards to the subject. It helps student to create robust and accurate design and documentation through the construction process. To leverage the full advantages of BIM in the construction building industry, the industry will need to make some changes to the current practice. This module designed around an ideal, integrated workflow to help students make this transition. The module focuses on the techniques fundamental on how to use powerful modelling techniques, how to design documentation best practices, how to make compelling presentation graphics, and how to take advantage of parametric design. Throughout the module some practical experience will be shared with students, particularly in the form of real-world-scenario. Copious illustrations and a clear step-by-step approach make this module ideal for blended learning and coursework-based study.

Learning Outcomes

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

- (i) Relate the theories and to designate practical ways for CAD and building Information modeling
- (ii) Provide and regulate proper use of BIM for any building project
- (iii) Review and explain the advanced BIM ability and procedures using 3D CAD BIM with cost/program information.

REG 360 – Industrialised Building System (IBS)

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

Learning Outcomes

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

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

REG 361 - Methods of Construction

This course encompasses the process involved in methods of construction. Students will be exposed to the soil suitability research theoretically and practically, requirements for stability and foundation types. They will learn how to carry out analysis and how to implement the basic of foundation design by doing laboratory testing and site testing. This will ensure the safe foundation for building construction. Later, they will be introduced to the process that take place during the construction, namely earth work; including cleaning, cut and fill, dewatering process from the construction site. The basic design and preparation of concrete construction and removal of the formwork for the prefabricated construction system, pre-stressed concrete construction and high-rise construction will also be covered.

Learning Outcomes

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

- (i) Interpret the soil adaptation and carry out laboratory and site studies in the group.
- (ii) Adapts the method of determining the characteristics of soil engineering and building stability as well as infrastructure.
- (iii) Propose construction techniques at construction sites using appropriate technology and equipment.
- (iv) Report and resolve construction issues using engineering principles.

REG 368 - Road and Transportation

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

Learning Outcomes

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

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

REL 300 – Building Engineering Technology Studies 1

The Final Year Project requires students to carry out a research project on a chosen topic in Building Engineering and Technology under supervision. Research can be conducted in the form of literature review, experimental study, modelling, simulation, computational, case study, survey, etc. This first part of building engineering and technology studies

focuses on developing research or project methodologies based on the need to discover solutions to certain problems. Students will undergo rigorous problem identification by going through existing literatures and going to the field as well as communicating with the industry practitioners to form realistic research questions. Research or project methodologies will then be constructed to find answers or solutions to the problems in REL 470.

Learning Outcomes

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

- (i) Identify issues related to research topic with a problem statements arising from observations and reading
- (ii) Formulate questions of study and form realistic research objectives and methodology.
- (iii) To produce complete proposal writing paper-based with ethic and professionalism

REG 371 – Design of Concrete Structures

This course equipped students with knowledge on reinforced concrete design. Knowledge on the behaviour and properties of concrete is explained. The ultimate limit state concept design in reinforced concrete will also be explained. Students are exposed to the knowledge of design analysis of main structure; slab, beam, column and footing. Students are also exposed to the basic design of reinforced concrete.

Learning outcomes

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

- (i) Able to elaborate the behaviour of reinforced concrete and the concept of limit state in structure design
- (ii) Able to analyse loading types and forces for design purposes
- (iii) Able to design reinforced concrete structural members in accordance to the code of practice

REG 469 - Professional Practice for Engineering Technologist

This course emphasize on the professional practices of Building Technologies in Malaysia and its evolution

within the framework of Board of Engineers(BEM) and commonwealth countries. It includes ethics and behavior of professional, their responsibilities, and services, and also enforcing of related laws & regulations

Learning Outcomes

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

- (i) Describe the principles and professional practice of building technologist
- (ii) Demonstrate the professional practice of engineering technology with ethical and integrity responsibilities in the construction and building industry.
- (iii) Explain the role of the engineering technologist in the complete pre-cycle, during and after construction and building phases.

REL 400 - Building Engineering Technology Studies 2

This course is a continuation of REL370. In this second part of building engineering and technology studies, students will carry out data collection activities using appropriate methodologies established in the previous stage. Students will then be expected to present the analyzed data in form of tables, charts and graphics and be able to produce meaningful discussion and debate in a written report. Research findings should be reported in the form of introduction, objectives of research, scope of study, literature review, research methodology, data collection/experimental work, data analysis, results and discussions, conclusions and recommendations and references. A scientific report in the form of a final year project report should be submitted at the end of the research and the student is required to communicate the findings of the research through an oral presentation. In addition, students will also be trained to produce their findings as an article in standard publications format.

Learning Outcomes

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

- (i) To plan and implement data collection work

related to research/project issues

- (ii) Use the appropriate data analysis and methodology due to topic/research
- (iii) Present result of study/project in writing and oral form.

REL 471 - Industrial training

This course is the compulsory industrial training for students in the School of Housing, Building & Planning. It emphasizes the professional practices training in the respective fields preparing students to face the real world challenges in the related industry. It is conducted in Semester 2 at 4th Year level for duration of 24 weeks (6 months) continuously according to the requirement of the professional bodies.

Learning Outcomes

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

- (i) solve the tasks based on the given work field
- (ii) demonstrate the ability to communicate and teamwork
- (iii) demonstrate the responsibilities with ethic
- (iv) acquire management and entrepreneurial skills

4.7.2 Elective Courses

RMK 153 – Principles of Construction Economics

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

Learning Outcomes

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

- (i) Demonstrate the ability to relate economic principles to the construction industry market .
- (ii) Reproduce economic development models based on current situations .
- (iii) Study the problems within the construction industry based on the volatility of the economy system.
- (iv) Report the findings on the relationship between

economy and the construction industry.

RQG 236 – Measurement 1

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

Learning Outcomes

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

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

RQG 237 – Measurement 2

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

Learning Outcomes

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

- (i) Demonstrate measurement techniques

systematically for sub-structure, structural frame and infrastructure works according to the Standard Method of Measurement for Building Works, 2nd Edition (SMM2) and the Malaysian Civil Engineering Standard Methods of Measurement (MyCESMM).

- (ii) Measure the quantity of sub-structure, structural frame and infrastructure works in detail and accurately.
- (iii) Construct a detail and clear description of the measured elements.

RMK 252 – Principles of Project Management

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

Learning Outcomes

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

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

RBG 351 - Building Maintenance

This course focuses on Maintenance Management and Technology. Students are exposed to variety types of building maintenance; planned and un-planned maintenance methods, maintenance policy, impact of design on maintainability, prioritizing and costing the maintenance works, budgeting and funding the maintenance works and maintenance procurement. It is also emphasis on building maintenance management technology for commercial building. Students are also exposed to preparation of maintenance plan and specification writing for maintenance works.

Learning Outcomes

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

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

RMK 156 – Health, Safety and Environmental Management

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

Learning outcomes:

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

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

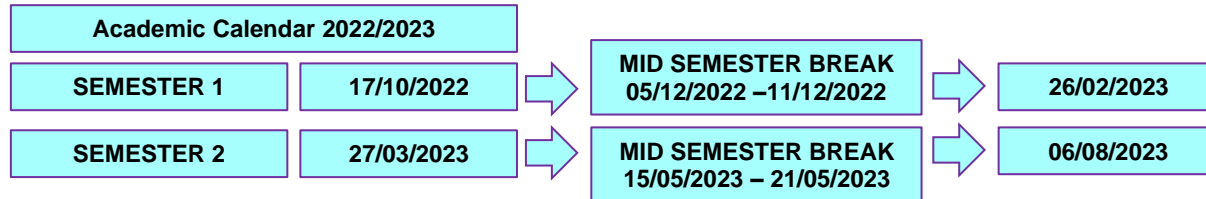
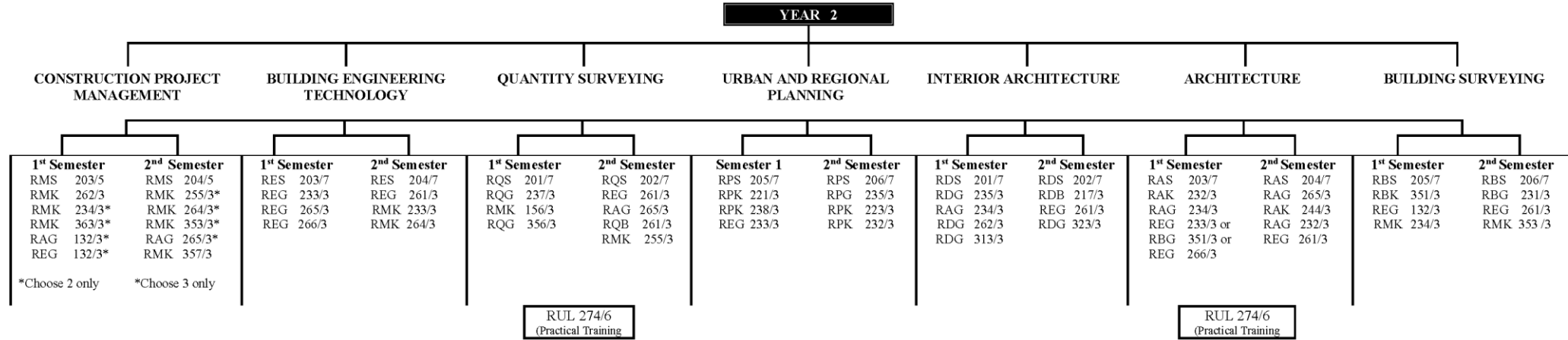
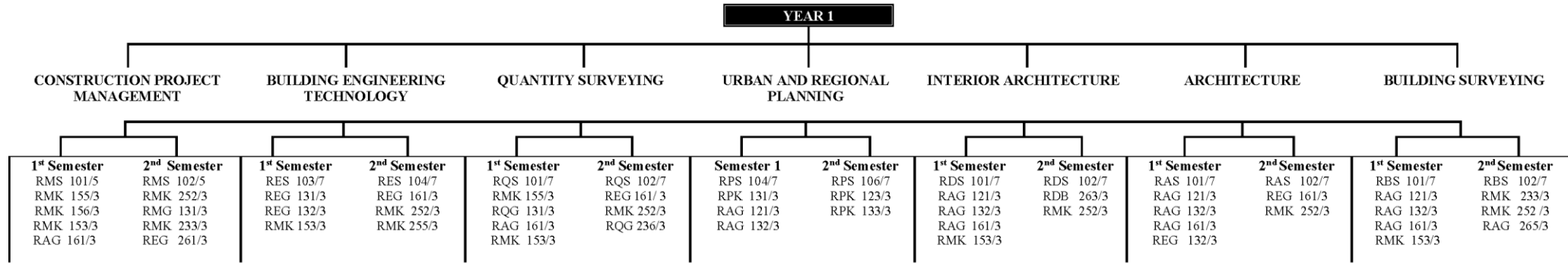


COURSE STRUCTURE

UNDERGRADUATE PROGRAMME BUILDING ENGINEERING TECHNOLOGY

UNDERGRADUATE PROGRAMME BUILDING ENGINEERING TECHNOLOGY							
YEAR 1							
SEMESTER 1				SEMESTER 2			
RES 103	Building Engineering Technology Studio 1	T	7	RES 104	Building Engineering Technology Studio 2	T	7
REG 131	Mathematics for Engineering Technology	T	3	REG 161	Construction Materials	T	3
REG 132	Structural Mechanics	T	3	RMK 252	Principles of Project Management	E	3
RMK 153	Principles of Construction Economics	E	3	RMK 255	Law and Practice of Construction Project	E	3
	University Course	U	2		University Course	U	2
	University Course	U	2				
	UNITS		20		UNITS		18
YEAR 2							
SEMESTER 3				SEMESTER 4			
RES 203	Material and Structural System Studio	T	7	RES 204	Engineering Services and Environmental Technology Studio	T	7
REG 233	Geomatic Technology	T	3	REG 261	Building Services	T	3
REG 265	Infrastructure Technology	T	3	RMK 233	Measurement Of Building Works	E	3
REG 266	Structural Analysis	T	3	RMK 264	Construction and Financial Management	E	3
	University Course	U	4		University Course	U	2
	UNITS		20		UNITS		18
YEAR 3							
SEMESTER 5				SEMESTER 6			
RES 301	Infrastructure, Energy and Transportation Studio	T	7	RES 302	Computer Aided Design and Information Modelling Studio	T	7
REG 361	Methods of Construction	T	3	REL 300	Building Engineering Technology Studies 1	T	3
REG 371	Design of Concrete Structure	T	3	REG 360	Industrialised Building System	T	3
RMK 156	Health, Safety and Environmental Management	E	3	RQG 236	Measurement 1	E	3
	University Course	U	1	RQG 355	Management, Sustainability and Internationalisation	E	3
	UNITS		17		UNITS		19
YEAR 4							
SEMESTER 7				SEMESTER 8			
REL 400	Building Engineering Technology Studies 2	T	5	REL471	Industrial Training	T	12
REG 468	Road and Transportation	T	3				
REG 469	Professional Practice for Engineering	T	3				
RBG 351	Building Maintenance	E	3				
	University Course	U	2				
	UNITS		16		UNITS		12
						</	

CURRICULUM AT SCHOOL OF HOUSING, BUILDING AND PLANNING



YEAR 3													
CONSTRUCTION PROJECT MANAGEMENT		BUILDING ENGINEERING TECHNOLOGY		QUANTITY SURVEYING		URBAN AND REGIONAL PLANNING		INTERIOR ARCHITECTURE		ARCHITECTURE		BUILDING SURVEYING	
1 st Semester	2 nd Semester	1 st Semester	2 nd Semester	1 st Semester	2 nd Semester	1 st Semester	2 nd Semester	1 st Semester	2 nd Semester	1 st Semester	2 nd Semester	1 st Semester	2 nd Semester
RMS 305/5	RMS 306/5	RES 301/7	RES 302/7	RQS 303/7	RQS 304/7	RPS 303/7	RPS 304/7	RDS 301/7	RDS 302/7	RAS 305/7	RAS 306/7	RBS 304/7	RBS 307/7
RMK 336/3*	RMK 358/3*	REG 361/3	REL 300/3	REG 265/3	RQG 358/3	RPK 331/3	RPK 333/3	RAG 333/3	RDB 314/3	RAG 333/3	RAG 322/3	RBG 351/3	RBG 332/3
REG 233/3*	RAK 345/3*	REG 371/3	REG 360/3	REG 361/3	RQG 355/3	RPK 334/3	RPK 359/3	RDG 334/3	RDG 336/3	RAK 346/3	RAK 345/3	RBL 370/3	RBL 372/3
REG 265/3*	REG 460/3	RMK 156/3	RQG 236/3	RQL 371/3	RQL 371/3	RPK 351/3	RPK 343/3*	RAK 232/3	RDG 366/3	RAL 371/3	RMK 255/3	REG 361/3	
RBG 351/3*			RQG 355/3				RAK 345/3*		RDG 370/3		REG 360/3		
REG 361/3*							RMK 336/3*						
REG 468/3							RMK 357/3*						
*Choose 3 only	*Choose 2 only						*Choose 1 only						

YEAR 4									
CONSTRUCTION PROJECT MANAGEMENT		BUILDING ENGINEERING TECHNOLOGY		URBAN AND REGIONAL PLANNING		INTERIOR ARCHITECTURE		BUILDING SURVEYING	
1 st Semester	2 nd Semester	1 st Semester	2 nd Semester	1 st Semester	2 nd Semester	1 st Semester	2 nd Semester	1 st Semester	
RUL 474/12	RML 470/6	REL 400/5	REL 471/12	RUL 474/12	RPS 409/7	RUL 474/12	RDS 401/7	RBL 401/12	
(Industrial Training)	RMK 455/3*	REG 468/3	(Industrial Training)	(Industrial Training)	RPK 435/3	(Industrial Training)	RDL 470/3	(Industrial Training)	
	RQG 355/3	REG 469/3			RPK 439/3				
		RBG 351/3			RMK 472/4				
	*Choose 1 only								



University/Option		
Bahasa Malaysia	: 2 unit	U
English language/Other language	: 4 unit	
Philosophy & Current Issues (Local & international students)	: 2 unit	
Appreciation of Ethics & Civilisation (Local students)	: 2 unit	
Malaysian Studies (International students)	: 4 unit	
Core-Entrepreneurship (Local students)	: 2 unit	
Co-Curriculum	: 2 unit	
Other Co-Curriculum /Option/Skill Courses/Third language		
i) URP, CPM	: 7 unit	
ii) IA, BS, QS	: 5 unit	
ii) Architecture, BEsT	: 1 unit	
Total Unit (URP, CPM)	: 21 unit	
Total Unit (IA, BS, QS)	: 19 unit	
Total Unit (Architecture, BEsT)	: 15 unit	

Notes: Maximum Units Allowed for Registration per Semester is 21 (including University/Option courses)