



ACADEMIC GUIDELINES

FACULTY OF CIVIL ENGINEERING

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This book contains brief information about Full-time Undergraduate Degree Programme in Civil Engineering at the UTM- Faculty of Civil Engineering Universiti Teknologi Malaysia. Detailed information on the academic matter can be obtained from the following documents:

1. UTM Prospectus
2. UTM Academic Regulations

The contents of this book are accurate at the time of printing. Any amendments or clarification is subject to the discretion of the UTM-Faculty of Civil Engineering, Universiti Teknologi Malaysia.

Suhaimi Abu Bakar

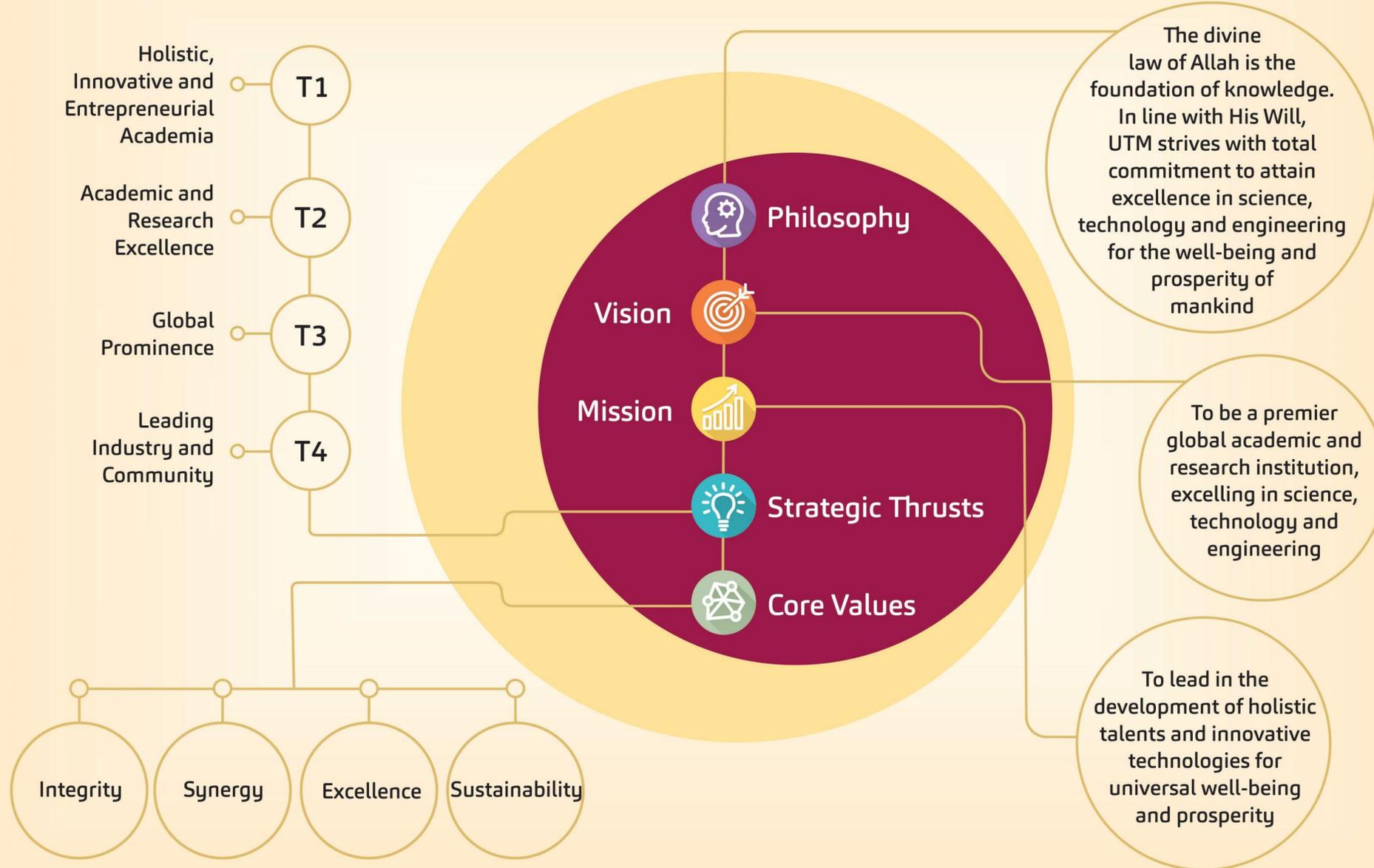
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UTM Philosophy, Vision, Mission, Strategic Thrusts and Core Values



FOREWORD BY THE DEAN

*.Assalamualaikum wrt wbr*and Greetings,

Let me be among the first to congratulate you for being admitted to the Faculty of Civil Engineering (UTM-FKA) the top 100 civil engineering faculty based on QS World Ranking Agency, and one of the top civil engineering faculties in Malaysia. Surely, your presence here is the result of your tireless effort in your study as well as supports and prayers from your parents.

You are considered the lucky one selected to be with us. This golden opportunity is indeed priceless. I hope that you will use the time spent at FKA wisely and do your utmost to acquire knowledge, experiences, and exposures necessary to be a successful civil engineer. Excellence requires detailed planning, perseverance, and high unparalleled discipline.

This Academic Guidelines handbook contains information pertaining to the academic programme at FKA. It also includes regulations and guidelines that will guide you throughout your study. Please treat this handbook as your main source of reference should any problem and uncertainty related to your academic affairs arises. The information in this handbook will be of great value if used wisely.

To our prospective students, we look forward to seeing you around. To our current students, we hope you will enjoy and benefit your stay as we believe it will lead to rewarding careers. We hope that you will graduate successfully as a civil engineer with flying colours.

Thank you, *Wassalam*.

Professor Dr. Edy Tonnizam bin Mohamad

Dean

Faculty of Civil Engineering

Universiti Teknologi Malaysia



1.1 UTM-Faculty of Civil Engineering

UTM's establishment is in line with the development of the civil engineering faculty since the objective and its inception was to train Technical Assistants, for the Department of Railways, Survey and Public Works, Federated Malay States. UTM started in 1904 when the Treacber Technical School began its operation at Weld Road (now Jalan Raja Chulan) to train Technical Assistants.

The school was then upgraded to the status of Technical College and officially opened on March 1, 1905 officiated by the British High Commissioner, Sir Donald Mac Gillivray. The college offered courses at a Diploma level and one of the courses was a Diploma in Civil Engineering. On March 1972, His Majesty DYMM Yang Dipertuan Agong officially proclaimed the formation of Institut Teknolgi Kebangsaan (ITK) under section 5 (1) of the university and University College Act, 1971. On 1 April, 1975 the institute reached another milestone of its history when it was officially declared as Universiti Teknologi Malaysia. The Faculty of civil engineering started with a Department of Engineering in 1972, and later became a Faculty in 1975. The journey of the faculty started as a college becoming an institute and finally a faculty.

In 1989, the Faculty moved from the UTM Kuala Lumpur Campus at Jalan Semarak to UTM Johor Bahru Campus. During its initial formation, the faculty had 3 departments, namely the Structures and Materials Department, the Hydraulics and Hydrology Department and the Geotechnics and Transport Department. The new Environmental Engineering Department was set up in 1976. To support the service and future development of the faculty, three (3) management units were formed. The units are Information Technology Unit (ITUCE), Surveying Unit and Civil Engineering Testing Unit (CETU). The faculty has a long history of producing distinguished graduates who have contributed substantially of the development of the infrastructure in Malaysia.

In 2018, Universiti Teknologi Malaysia has embarked on a unique history when undertaking the restructuring of its academic entity and witnessing the merger of faculty from 18 to seven. The restructuring is effective from 1 July 2018. The restructuring, known as UTM Synergy 4.0 leads the university to have only seven faculties, one of them is Faculty of Engineering. This major transformation is meant to open more opportunities for synergy and collaborations between academicians from different academic disciplines and innovation in offering academic programs that can fulfill the new needs of the society in the future.

The Faculty of Engineering is a result of the merger of Faculty of Civil Engineering, Faculty of Electrical Engineering, Faculty of Mechanical Engineering, Faculty of Chemical and Energy Engineering, Faculty of Computing and Faculty of Bioscience and Medical Engineering. Then, the name of School of Civil Engineering was established after the merger of Faculty of Engineering. In 2021, School of Civil Engineering have been back as Faculty of Civil Engineering.



"VISION"

TO BE A WORLD-CLASS
EDUCATION AND RESEARCH
CENTRE IN "CIVIL ENGINEERING"

"MISSION"

TO SPEARDHEAD EXCELLENCE IN
ACADEMIC AND TECHNOLOGY
DEVELOPMENT THROUGH
CREATIVITY

"Always Ahead"

CARTA ORGANISASI FAKULTI KEJURUTERAAN AWAM



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Faculty of
Civil Engineering



**PROF. DR. EDY TONNIZAM
MOHAMAD**
Dekan



**PROF. MADYA
DR. NOR ZURAIRAHETTY**
MOHD YUNUS
Pegawai
Jab. Geoteknik & Pengangkutan



**IR. DR. NOOR NABILAH
BINTI SARBINI**
Pegawai
Jab. Struktur & Bahan



**PROF. MADYA IR. TS.
DR. MOHAMAD HIDAYAT JAMAL**
Pegawai
Kejuruteraan Air
dan Alam Sekitar



**PROF. MADYA DR. SUHAIMI
ABU BAKAR**
Timbalan Dekan
(Akademik & Hal Ehwal Pelajar)



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DR. AHMAD SAFUAN A. RASHID**
Timbalan Dekan
(Penyelidikan, Inovasi dan Pembangunan)



MOHD FAUZI ABD. RAHMAN
Timbalan Pendaftar

Staf Akademik



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Pegawai Akademik
Pasca Siswazah



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Pegawai Akademik
Program Luar

Staf Pentadbiran dan Sokongan



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MOHD SATAR**
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Pegawai Pengurusan
Pengetahuan /Perundingan
Penyelidikan

Staf Pentadbiran, Sokongan dan
Pembantu Penyelidik



**NURAZLYNA
MOHAMAD MARJID**
Timbalan Pendaftar



**MOHAMAD KHALID
MOHAMED HABEER**
Pegawai IT

Staf Pentadbiran, Sokongan dan Staf
Teknikal



**NAWAWI
MOHDSALLEH**
Pegawai Fasiliti

DEPARTMENT IN FACULTY OF CIVIL ENGINEERING



DEPARTMENT OF
STRUCTURE AND
MATERIALS

52 STAFF



DEPARTMENT OF
GEOTECHNICAL
AND
TRANSPORTATION

27 STAFF



DEPARTMENT OF
WATER AND
ENVIRONMENTAL
ENGINEERING

36 STAFF

CENTRE OF EXCELLENCE (COE)

CRC

Construction
Research Centre

GEOTROPIC

Centre of Tropical
Geoengineering

IPASA

Centre for Environmental
Sustainability & Water Security

CFE

Centre for
Forensic
Engineering

COEI

Centre of
Coastal
Engineering

LABS

CETU

Civil Engineering
Testing Unit

SKA

**Surveying Unit
Lab**

3.0 FACILITIES

The UTM-Faculty of Civil Engineering has one of the largest civil engineering teaching and research facilities in the country. The main facilities include smart classrooms, lecture theatres and halls, well-equipped laboratories, IT facilities and a resource center.

3.1 Lecture Theatres, Halls and Classrooms

The Faculty has one lecture theatre and two theatres that can accommodate 120 each. There are fifteen classrooms that can seat 60 students. One of the lecture halls is equipped with 'smart E theatre' facilities and three of the classrooms are equipped with "Active Learning Classroom".

There are room for practical and studio work that can accommodate between 50-60 students each, and two 60-capacity classrooms for Problem-Based Learning (PBL) activities. To cater for examination needs there are three examination halls with a capacity of 120-200 students.

All lecture theatres, halls and classrooms are fully air-conditioned and are equipped with the latest teaching and learning aids.

3.2 Laboratories

There are six main research laboratories which include the Structure and Material laboratory (5860 m²) Block D04, the Geotechnics laboratory (2870 m²) Block D03, the Transportation laboratory (3200 m²) Block D02, the Hydraulics and Hydrology laboratory (4450 m²) Block D01, the Environmental Engineering laboratory (1170 m²) Block C07 and the Surveying laboratory (150 m²) Block M47.

These laboratories are equipped with a wide range of the latest state-of-the-art equipment and testing facilities. Faculty also has a teaching laboratory building located at Block M50.

3.3 IT Facilities

The IT facilities at the Faculty consist of four computer laboratories containing more than two hundred computers for teaching and students' use. Networking and internet facilities with wi-fi access points are available throughout the premises. The Faculty also provides various engineering and general purpose software to assist students in their study.

3.4 Resource Center

The Faculty houses a resource center (190 m²) that is manned by trained personnel to provide students and staff with specific civil engineering references such as a collection of theses, staff publications, reports and relevant textbooks. The center is also responsible for the management of teaching and learning equipment such as computers, LCD projectors, audio, and video equipment.

4. PROGRAMME OF STUDY

4.1 Programme Specification

The Bachelor of Civil Engineering with Honours is offered either on a full-time or part-time basis. The full-time programme is the main programme, offered by the Faculty while the part-time programme is offered by the School of Professional and Continuing Education (UTMSPACE). The full-time programme is offered only at the UTM Main Campus in Johor Bahru while the part-time programme is offered at various learning centres throughout Malaysia. The duration of study for the full-time programme is subjected to the student's entry qualifications and lasts between four (4) years to a maximum of six (6) years. Further information on the part-time programme is available at <https://engineering.utm.my/civil/spaceska> and <https://utmSPACE.edu.my>

4.1.1 General

1. Awarding Institution	Universiti Teknologi Malaysia			
2. Teaching Institution	Universiti Teknologi Malaysia			
3. Programme Name	Bachelor of Civil Engineering with Honours			
4. Final Award	Bachelor of Civil Engineering with Honours			
5. Programme Code	SKAW-02			
6. Professional or Statutory Body of Accreditation	Kementerian Pendidikan Malaysia			
7. Language(s) of Instruction	English and Bahasa Melayu			
8. Mode of Study (Conventional, distance learning, etc)	Conventional			
9. Mode of operation (Franchise, self-govern, etc)	Self-governing			
10. Study Scheme (Full Time/Part Time)	Full Time			
11. Study Duration	Minimum : 4 yrs Maximum : 6 yrs			
Type of Semester	No. of Semesters		No of Weeks/Semester	
	Full Time	Part Time	Full Time	Part Time
Normal	8	-	8	-
Short	4	-	4	-

4.1.2 Entry Requirements

The minimum qualifications for candidates who intend to do a Bachelor of Engineering (Civil) with Honours are as follows:

- 1) Minimum results based on **the Malaysian High School Certificate (STPM)** (results would be based on the general requirements as well as other conditions as the pre-requisites for the programme set by the university).

General University Requirements:

- i. Passed and obtained good results in the **Malaysian Certificate Examination (SPM)** or its equivalent.
- ii. Passed Bahasa Melayu /Bahasa Malaysia with **credit** in the SPM/equivalent.
- iii. Passed the **Malaysian High School Certificate (STPM)** or its equivalent and obtained the following:
 - a) **Grade C (NGMP 2.00)** General paper, and
 - b) **Grade C (NGMP 2.00)** in two (2) other subjects
- iv. Passed the **Malaysian University English Test (MUET)** with minimum result of **Band 1**.

Special Requirements for the Programme

- i. Obtained a **CGPA of 2.80**; and Passed with a minimum **Grade B- (NGMP 2.67)** in two of the following subjects:
 - a) Mathematics T / Further Mathematics
 - b) Physics/ Chemistry/ Biology(Eligible candidates in **Physics** subjects at Matriculation / Foundation must obtained minimum of **Grade C** in SPM for **Chemistry** subjects.)
Or
(Eligible candidates in **Chemistry or Biology** subjects at Matriculation / Foundation must obtained minimum of **Grade C** in SPM for **Physics** subjects.)
- ii. Passed **Mathematics** and **Physics** in SPM with minimum of **GED C**.
- iii. Passed the **Malaysian University English Test (MUET)** with minimum result of **Band 2**.
- iv. No disabilities which inhibit physical activities.

- 2) Minimum requirements for **Matriculation Certificates (KPM) / Asasi Sains UM / Asasi UiTM** (fulfil the general requirements set by the university as well as other conditions of the programme).

General University Requirements

- i. Passed the **Malaysian Certificate Examination (SPM)** / equivalent examination with **GED C** in Bahasa Melayu/Bahasa Malaysia.
- ii. Passed the **Matriculation Certificate Examination KPM/Asasi Sains UM / Asasi UiTM** with a minimum **CGPA of 2.00** and passed all the core subjects.
- iii. Passed the **Malaysian University English Test (MUET)** with minimum result of **Band 1**.

Special Requirements of the Programme:

- i. Obtained a **CGPA of 2.80**; and Passed with a **Grade B- (CGPA 2.67)** in two of the following subjects:
 - a) Mathematics
 - b) Physics/ Engineering Physics / Chemistry / Engineering Chemistry / Biology (Eligible candidates in **Physics / Engineering Physics** subjects at Matriculation / Foundation must obtained minimum of **Grade C** in SPM for **Chemistry** subjects.)
- Or**
- (Eligible candidates in **Chemistry / Engineering Chemistry or Biology** subjects at Matriculation / Foundation must obtained minimum of **Grade C** in SPM for **Physics** subjects.)
- ii. Passed **Mathematics** and **Physics** in SPM with minimum of **GED C**.
 - iii. Passed the Malaysian University English Test (MUET) with minimum result of **Band 2**.
 - iv. No disabilities which inhibit physical activities.
- 3) Minimum qualifications for students with **Certificates/Diplomas** (Fulfill the general requirements set by the university as well as specific requirements of the programme).

General University Requirements

- i. Passed the **Malaysian Certificate Examination (SPM)** / equivalent examination with **credit** in Bahasa Melayu/Bahasa Malaysia.
- ii. Obtained a **Diploma** or **other equivalent** qualification recognized by the **Government of Malaysia** and approved by the **Senate of IPTA**.
or
Passed the **Malaysian High School Certificate (STPM)** in year 2016 or earlier with minimum result of:-
 - **Grade C (NGMP 2.00)** General paper
 - **Grade C (NGMP 2.00)** in two (2) other subjects
- iii. Passed Matriculation examination in year 2015 or earlier with minimum of **CGPA 2.00**.
- iv. Passed the Malaysian University English Test (MUET) with minimum result of **Band 1**.

Special Requirements of the Programme:

- i. Obtained a **Diploma in Civil Engineering from UTM**/equivalent with a minimum **CGPA of 2.70**; or for candidates with a CGPA below 2.70 but have a minimum of **two or more years of working experience** in the related area of study will be eligible to apply for a place to study at the university.
- ii. Obtained a **credit pass in Mathematics** in their SPM/equivalent examination or a minimum **grade C** in any of the Mathematics Courses taken at the diploma level.
- iii. Passed the Malaysian University English Test (MUET) with minimum result of **Band 2**.
- iv. No disabilities which inhibit physical activities.
- v. Candidates are required to submit the results transcript of all their

examinations taken during their Diploma study (semester one until the final semester) to UTM. A copy of the diploma or a letter of completion of study will also have to be submitted together with their applications.

Note: - Year of entry and duration of study will be based on the credit exemptions and credit transfer awarded by the university.

4.1.3 Programme Educational Objectives (PEO)

CODE	INTENDED EDUCATIONAL OBJECTIVES
PEO 1	Competent, innovative and entrepreneurial in acquiring and applying knowledge towards solving Civil Engineering problems.
PEO 2	Possess leadership qualities, able to work, manage in diverse teams and serve the society in multi-disciplinary environment.
PEO 3	Demonstrate professionalism and uphold ethical values with emphasis on sustainable environment.
PEO 4	Communicate effectively, possess strong self-confidence and recognize the need for life-long learning.

4.1.4 Programme Learning Outcomes (PLO)

After having completed the programme, graduates should be able to demonstrate the following competencies:

CODE	INTENDED EDUCATIONAL OBJECTIVES
PLO 1	Apply knowledge or mathematics, natural science, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to the solution of complex engineering problems.
PLO 2	Identify, formulate, conduct research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences (WK1 to WK4)
PLO 3	Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations (WK5)
PLO 4	Conduct investigation of complex engineering problems using research-based knowledge (WK8) and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions
PLO 5	Create, select, and apply appropriate techniques, resources and modern engineering and IT tools, including prediction and modelling to complex engineering problems with an understanding of the limitations (WK6)
PLO 6	Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems (WK7)
PLO 7	Understand and evaluate the sustainability and impact of professional engineering work in the solutions of complex engineering problems in societal and environmental contexts (WK7)
PLO 8	Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice (WK7)
PLO 9	Function effectively as an individual, and as a member of leader in diverse teams and in multi-disciplinary settings
PLO 10	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
PLO 11	Demonstrate knowledge and understanding of engineering management principles and economic decision making and apply these to one's own work, as a member and leader in a team, to manage projects in multidisciplinary environments
PLO 12	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

**Mapping of Core Courses to Program Outcomes (PLO),
Complex Problem Solving (WP), Complex Engineering Activities (EA), and Knowledge Profiles (WK)**

CORE COURSES OFFERED			Program Outcomes										Complex Problems							Complex Eng. Activities					Knowledge Profiles									
			Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Investigation	Modern Tool Usage	The Engineer and Society	Environment and Sustainability	Ethics	Individual and Team Work	Communication	Project Management & Finance	Life Long Learning	Depth of knowledge	Range of conflicting	Depth of analysis	Familiarity of issues	Extent of applicable codes	Extent of stakeholder involvement	Interdependence	Range of resources	Level of interaction	Innovation	Consequences to society	Familiarity	Theory-based natural	Conceptually-based	Engineering fundamentals	Engineering specialist knowledge	Engineering design	Engineering practice	Role of engineering in society	Research literature
			PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11	PLO 12	WP 1	WP 2	WP 3	WP 4	WP 5	WP 6	WP 7	EA 1	EA 2	EA 3	EA 4	EA 5	WK 1	WK 2	WK 3	WK 4	WK 5	WK 6	WK 7	WK 8
1	SEAA 1011	Introduction to Civil Engineering	0.9							0.1																								
2	SEAA 1023	Engineering Surveying	0.8	0.1								0.1	X								X										X			
3	SEAA 1031	Survey Camp	0.1	0.1		0.3				0.2	0.3		X								X									X				
4	SEAA 1213	Engineering Mechanics	0.9							0.1				X								X				X	X							
5	SEAA 1422	Engineering Drawing	0.4			0.3				0.3			X								X									X				
6	SEAA 1513	Fluid Mechanics	0.35	0.55						0.1			X								X							X						
7	SEAA 1713	Soil Mechanics	0.9							0.1															X	X						X		
8	SEAA 2012	Civil Engineering Laboratory I		0.5		0.4				0.1			X												X		X		X					
9	SEAA 2032	Mechanical & Electrical Systems	0.4	0.5						0.1																								
10	SEAA 2112	Civil Engineering Materials	0.9									0.1	X								X							X						
11	SEAA 2223	Mechanics of Materials & Structures		0.9	0.1										X							X						X						
12	SEAA 2413	Computer Programming			0.4	0.55						0.05			X						X						X							
13	SEAA 2513	Hydraulics	0.8									0.2	X		X						X							X						
14	SEAA 2712	Eng. Geology & Rock Mechanics	0.5	0.4		0.1							X								X					X								X
15	SEAA 2722	Geotechnics I		0.9		0.1							X								X					X	X							
16	SEAA 2832	Highway Engineering		0.9								0.1	X	X			X												X					
17	SEAA 2912	Water Treatment	0.35		0.50							0.15									X										X			
18	SEAA 2922	Wastewater Engineering	0.3		0.6							0.1			X						X					X	X			X				
19	SEAA 3012	Civil Eng. Laboratory II		0.5		0.4				0.1			X												X		X		X					
20	SEAA 3022	Integrated Design Project 1			0.6	0.2				0.1	0.1		X	X							X	X						X		X		X	X	

4.1.6 Classification of Courses

NO.	CLASSIFICATION	CREDIT HOURS	PERCENTAGE
i.	University Courses a. General b. Service (Mathematic) c. Language d. Entrepreneurship e. Co-Curriculum	8 15 8 2 2	26.0%
ii.	Faculty/Programme Core	91	67.4%
iii.	Programme Electives	9	6.6%
	Total	135	100%
For engineering programmes please complete the following classification. (Others please refer to the Statutory Body guidelines)			
A	Engineering Courses (a) Lecture/Project/Laboratory (b) Workshop/Field/Design Studio (c) Industrial Training (d) Final Year Project	83 6 5 6	74.1%
Total Credit Hours for Part A		100	
B	Related Courses (a) Applied Science/Mathematic/Computer (b) Management/Law/Humanities/Ethics/Economy (c) Language (d) Co-Curriculum	15 10 8 2	25.9%
Total Credit Hours for Part B		35	
Total Credit Hours for Part A and B		135	100%
Total Credit Hours to Graduate		135 credit hours	

4.1.7 Programme Structures, Curriculums and Award Requirements

The programme is offered on full-time basis and is based on a two (2) semester per academic session. Generally, students are expected to undertake courses equivalent to between twelve (12) to eighteen (18) credit hours per semester. Assessment is based on coursework and final examinations given throughout the semester.

Award requirements:

To graduate, students must:

- Attain a total of not less than 135 credit hours with a minimum CGPA of 2.0.
- Pass Industrial Training
- Students from other approved programmes who wish to undertake a Minor in the programme must complete not less than 15 credit hours of specialized Civil Engineering courses which form part of the core and/or electives of the programme, as listed in the minor programme list.

YEAR 1					
SEMESTER 1			SEMESTER 2		
CODE	COURSES	CR.	CODE	COURSES	CR.
SEAA 1011	Introduction to Civil Engineering	1	SEAA 1023	Engineering Surveying	3
SEAA 1213	Engineering Mechanics	3	SEAA 1422	Engineering Drawing	2
SEAA 1513	Fluid Mechanics	3	SEAA 1713	Soil Mechanics	3
SSCE 1693	Engineering Mathematics I	3	SSCE 1793	Differential Equations	3
UHLB 1112	English Communication Skills	2	SSCE 1993	Engineering Mathematics II	3
ULRS1182	Appreciation Of Ethics & Civilizations	2	ULRS 1012	Value and Identity	2
UHLM1012 **	Malay Language for Communication 2	2			
TOTAL CREDIT		14	TOTAL		16

**Elective course for international students only

SHORT SEMESTER		
CODE	COURSES	CR.
SEAA 1031	Surveying Camp	1

YEAR 2					
SEMESTER 1			SEMESTER 2		
CODE	COURSES	CR.	CODE	COURSES	CR.
SEAA 2012	Civil Engineering Laboratory 1	2	SEAA 2112	Civil Engineering Materials	2
SEAA 2032	Mechanical and Electrical Systems	2	SEAA 2223	Mechanics of Materials and Structures	3
SEAA 2513	Hydraulics	3	SEAA 2413	Computer Programming	3
SEAA 2722	Geotechnics 1	2	SEAA 2712	Engineering Geology and Rock Mechanics	2
SEAA 2832	Highway Engineering	2	SEAA 2922	Wastewater Engineering	2
SEAA 2912	Water Treatment	2	SSCE 2193	Engineering Statistics	3
SSCE 2393	Numerical Methods	3	ULRF 2**2	Service Learning & Engagement Courses	2
UHLB 2122	Academic Communication Skill	2	ULRS 1022	Philosophy & Current Issues (Local Students)	2
TOTAL CREDIT		18	TOTAL CREDIT		19

YEAR 3					
SEMESTER 1			SEMESTER 2		
CODE	COURSES	CR.	CODE	COURSES	CR.
SEAA 3123	Construction Technology, Contract & Estimating	3	SEAA 3012	Civil Engineering Laboratory 2	2
SEAA 3243	Theory of Structures	3	SEAA 3022	Integrated Design Project 1	2
SEAA 3313	Reinforced Concrete Design 1	3	SEAA 3323	Structural Steel & Timber Design	3
SEAA 3412	Building Information Modelling and Data Management	2	SEAA 3613	Hydrology and Water Resources	3
SEAA 3712	Geotechnics 2	2	SEAA 3842	Traffic Engineering	2
UHLX 1**2	Foreign Language for Communication	2	SEAA 3913	Environmental Management	3
ULRS 3032	Entrepreneurship & Innovation	2	UHLB 3132	English for Professional Purpose	2
TOTAL CREDIT		17	TOTAL CREDIT		17

SHORT SEMESTER		
CODE	COURSES	CR.
SEAA 3045	Industrial Training	5

YEAR 4					
SEMESTER 1			SEMESTER 2		
CODE	COURSES	CR.	CODE	COURSES	CR.
SEAA 4021	Civil Engineering Seminar	1	SEAA 4032	Integrated Design Project 2	2
SEAA 4022	Research Methodology and Pre-Project	2	SEAA 4034	Final Year Project	4
SEAA 4223	Structural Analysis	3	SEAA 4113	Constructions & Project Management	3
SEAA 4##3	Elective 1	3	SEAA 4333	Reinforced Concrete Design 2	3
SEAA 4##3	Elective 2	3	SEAA 4##3	Elective 3	3
***3	OPEN ELECTIVE	3			
TOTAL CREDIT		15	TOTAL CREDIT		15

4.2 Our Uniqueness

- One of the biggest Civil Engineering faculties in the country.
- One of the biggest Civil Engineering lab/facilities in the country.
- A major contributor of Civil Engineering graduates in the local workforce.
- High employability rate of graduates.
- A major contributor of leaders in government and industrial sectors.
- The first Civil Engineering Faculty achieved ISO 17025:2005 certifications.
- Diversity of lecturers (qualification background from institutions all over the world).
- Students are given the opportunity to experience studying abroad through various programmes organized by the Faculty/ University. Programmes such as service learning and student exchange are highly sought after by students who want to broaden their knowledge and prepare themselves for the global market.

4.3 Career Prospects and Career Path

Graduates of the programme can be employed as Project Engineers, Construction Engineers, Hydraulic Engineers, Environmental Engineers, Highway and Transport Engineers, Geotechnical Engineers, Site Engineers, Design Engineers, and Structural Engineers.

4.4 Professional Skills Certificate (PSC)

Students are given a chance to enroll in certificate programs offered by the Centre of Excellence in the University and the School of Professional and Continuing Education (SPACE) during semester breaks:

For Compulsory Courses:

1. Design Thinking for Entrepreneur
2. Talent and Competency Management
3. English Communication Skills for Graduating Students (ECS)

For Electives Courses:

1. Data Analytics for Organization
2. Professional Ethics and Integrity
3. Construction Measurement (Mechanical & Electrical)
4. OSH for Engineering Industry and Laboratory
5. Quality Management for Built Environment and Engineering Professional
6. Safety and Health Officer Introductory Course
7. Industrial Machinery and Lubrication

4.5 Facilities Available

1. Structural Engineering Laboratory
2. Material Engineering Laboratory
3. Hydraulic sand Hydrology Laboratory
4. Environmental Laboratory
5. Geotechnical Laboratory
6. Highway & Transportation Laboratory
7. Computer Laboratory
8. Civil Engineering Testing Unit (CETU)
9. Resource Centre
10. Surveying Unit
11. Teaching Laboratory

4.6 Supports for Students and Their Learning

1. Personal Support
 - Academic Advisor
 - Student Academic Guidelines
 - Counseling
2. Infrastructure Support
 - Internet Access
 - E-Learning
 - Digital Library
 - Health Career and Recreational
3. Financial Support
 - Research Grant
 - Teaching Assistant
 - Research Assistant
 - Perbadanan Tabung Pengajian Tinggi Negara (PTPTN)
 - Basiswa Endowmen
 - Zakat

4.7 Methods for Evaluating and Improving the Quality and Standards of Teaching and Learning Mechanisms

1. Students' performance based on:
 - Good Pass (KB) and Conditional Pass (KS)
 - Cumulative Point Average (CPA)
 - Graduation On Time (GOT)
 - Analysis of course performance (Course Assessment Report – CAR)
 - Analysis of Programme performance (Programme Assessment Report – PAR)

2. Employability
 - Graduate Tracking Study Scheme/Skim Kajian Pengesanan Graduan (SKPG)
 - Alumni Survey
 - Market Survey
 - Employer Survey

3. Lecturer's Performance:
 - Teaching evaluation by students (e-PPP)
 - Alumni Survey
 - Competency checklist for staff (CV)
 - Annual staff appraisal (e-LPPT)

4. Other Supports
 - Faculty Academic Committee
 - PSM (undergraduate final year project) survey
 - External Examiner Reports
 - Industrial Advisory Panel Reports
 - Exit Survey
 - Students e-Portfolio
 - Generic Skills Evaluation

5. Delivery Systems
 - Quality Management System Committee (ISO 17025:2005)
 - CSI (Customer Satisfaction Index)
 - AKA Audit Report
 - SAR / EAC Standard

6. Role of External Examiners (Visiting Examiners)

Visiting Examiners are appointed by the Faculty Academic Committee to:

 - Review and evaluate program curriculum.
 - Review and evaluate assessment procedure and methods.
 - Make necessary recommendations to the Academic Committee

7. In general, the programme is realized based on the following approaches:
 - (i) **Lectures and Tutorials**

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

 - (ii) **Laboratory Activities**

The laboratory activities include testing and experiments related to the theories taught in the lectures. This is important to enhance the students' understanding of the basic theories and their applications.

(iii) **Practical Design Session**

All design and project-based courses are required to include hands-on design sessions.

(iv) **Problem Based Learning (PBL)**

Problem Based Learning is a very important component of teaching and learning process. PBL is implemented in a number of courses at the Faculty. It helps students to reinforce their understanding of the course contents.

(v) **Survey Camp**

Apart from the theories learnt during lectures, students are required to attend a two-week survey camp which is conducted outside of the campus during semester break.

(vi) **Industrial training**

All third-year students are required to undergo twelve (12) week Industrial Training at civil engineering establishments of their choice. At the end of the training, students are required to submit an Industrial Training Report to the Faculty for assessment purposes.

(vii) **Civil Engineering Seminar (SEMKA)**

This is a compulsory seminar that is organized to expose students to the latest technologies, practical knowledge and techniques that are applied in civil engineering practices. This is one of the methods to disseminate contemporary knowledge that could not be implemented in the traditional lecture settings. The speakers at the seminar are mostly local or foreign professionals.

(viii) **Final Year Project**

As part of the fulfillment for the award of the Bachelor's Degree, students have to complete a Final Year Project under the supervision of academic staff. The project must be completed within two semesters. Upon the completion of the project the students are required to give an oral presentation and submit a Final Year Project report. Failing to deliver either the oral presentation or the Final Year Project Report will result in failed status.

To enhance the generic skills of the students, the curriculum is designed to address generic skills through infusion or diffusion. By doing so, graduates from this Faculty would be competitive, competent and have high ethical values. The generic skill attributes are as stipulated in the Programme Selection.

4.8 Students' Academic Assessment

As the programme is implemented using the semester system, the performance of students is assessed continuously throughout the semester. The grades are given based on the coursework and the final examination.

4.9 Minor Programme

The Minor programme provides opportunities for students to gain knowledge in other areas of study and therefore become more competitive in the job market. The Minor programme is offered by a particular faculty with the consent of the University Senate. The programme consists of five (5) courses with a total credit is fifteen (15).

The group of courses for the minor programme is determined by the faculty offering the programme. It is based on the curriculum of the Bachelor's Degree programme offered by that particular faculty. In principle, the decision is based on the fulfillment of the criteria as stated by the University Senate. Participating in the minor programme does not entail any change to the original Bachelor's Degree programme.

The list of minor programme and courses can be obtained from the Guidebook for Minor Programmes produced by the Registrar's office (Academic Management). The guidebook is available for reference at the Faculty's Academic Office.

5. SEMESTER SYSTEM RULES AND GUIDELINE

5.1 Academic Advisory System and Role of Students

Every student is assigned an academic staff as an academic advisor. The objectives of the academic advisory system are:

- (i) To guide and assist students in adapting themselves to the academic system of the University, especially at the initial stage.
- (ii) To advise students in solving academic related problems such as workload, selection of courses and to explain the aim and purpose of the courses.
- (iii) To identify and provide counseling to problematic students as well as to develop a balanced character and positive attitude among students.
- (iv) To act as a link between students and the faculty.

With various services and facilities provided, the faculty expects students to be responsible in their study plan. The academic advisor should not be held responsible for the students' failure in completing their study on time. The students are advised to consult their academic advisor for the following matters:

- To obtain information on the semester system and other matters related to their study, during the first week of each semester.
- To obtain endorsement for registration or withdrawal of courses.
- To seek advice in planning for their study, particularly in terms of course selection, total number of credits and duration of study.
- To obtain endorsement for application of graduation award.

5.2 Academic Year

- (i) The University Academic Year is divided into two regular semesters, namely Semester I and Semester II. Each semester consists of 14 weeks of lectures, as shown in Table 1.
- (ii) The University also offers a short semester between the Academic Year. The implementation of the short semester is illustrated in Appendix VII. The semester is not included in the calculation of duration of study.

Table 1 : Academic Year*

Orientation Week (During the Year End Break)	1 week	
SEMESTER I		
Lectures	14 weeks	
Mid Semester Break	1 week	
Study Break	1 week	
Final Examinations	3 weeks	
Total	19 weeks	
End of Semester Break	4 weeks	
SEMESTER II		
Lectures	14 weeks	
Mid Semester Break	1 week	
Study Break	1 week	
Final Examinations	3 weeks	
Total	19 weeks	OR

End of Academic Year Break	10 weeks	Final Semester Break	1 week
SHORT SEMESTER			
		Lectures & Examinations	8 weeks
		Final Semester Break	1 week
TOTAL	52 weeks		

5.3 Programme Registration Guidelines

- (i) Students must register for the programme offered on the date stipulated by the University.
- (ii) If new students do not abide by item 1 without valid reasons acceptable to the University, the offer will be annulled.
- (iii) Students who have been determined to participate in the bridging program must complete the course prescribed before registering for the programme.
- (iv) Registration of the programme or senior students will be automatically done by the University administration based on the previous semester's examination results.
- (v) Senior students with Deferment of Study Status must re-register for the programme and the courses. Students who failed to do so within the specified time will be terminated from their studies.
- (vi) Senior students who are given the approval to register for the Minor Programme will have to do so at their faculty on the date determined by the University.

5.3.1 Course Code

Course Code consists of 4 alphabets and 4 digits as description below:



Programme to be awarded.

- C = Certificate
- D = Diploma
- S = Bachelors Degree
- L = Graduate Diploma
- M = Masters
- P = Doctor of Philosophy
- U = University's General Courses

A. Faculty/Centre

- KA = Civil Engineering
- BB = Built Environment
- CS = Computer Science and Information Systems

DP	=	Diploma Programme by UTM SPACE
KE	=	Electrical Engineering
GH	=	Geoinformation Real Estate
HA	=	Human Resource Development and Management
KK	=	Chemical Engineering
IC	=	Islamic Civilization
KM	=	Mechanical Engineering
PP	=	Education
KQ	=	General Course & Co-curriculum Centre
SC	=	Sciences
KB	=	Bio Medical & Health Science
QB	=	Bio Science and Bio Engineering
KP	=	Petroleum and Renewal Energy Engineering
LA	=	Language Academic
SP	=	Post Graduate School

5.4 Course Registration

- (i) Students must register for all the courses taken every semester.
- (ii) The course registration must be done before compulsory course registration period, which is **TWO** (2) days before the semester begins.
- (iii) All students must register for the course with the correct code, section, and status (if applicable) and obtain validation from the Academic Advisor.
- (iv) Students are responsible to amend any error in the course registration slip within the stipulated period.
- (v) Students with Probation Status (KS) will have their course pre-registration annulled. They are required to register within the specified compulsory course registration period.
- (vi) Students who failed to register for the course within the time stipulated without reasons acceptable to the University will be terminated.
- (vii) Students are fully responsible for ensuring that there is no mistake in the course registration records. Any amendment must be made within the duration stipulated by the University.
- (viii) Registration of Audit Courses (Hadir Sahaja - HS)
 - (a) A student with the approval of the faculty or has been instructed by the faculty cannot register more than TWO (2) courses with HS status in a semester.
 - (b) The credits from HS courses will not be used in the calculation of the student's GPA and CGPA.
 - (c) Students who enroll in HS courses must attend all meetings/lectures and complete all the coursework evaluations.
 - (d) Audit Course (HS) status will be recorded in the student's examination slip and transcript if he meets the requirement of item (c)
- (ix) Course Withdrawal (Tarik Diri - TD)
 - (a) A student with the approval of his lecturer and Academic Advisor can withdraw from any of his registered course.
 - (b) He must submit the application form to the faculty no later than the last working day of week EIGHT (8) of the semester.
 - (c) Approval for withdrawing from a course is subject to the required Minimum Credits except with the Dean's permission.
 - (d) Withdrawal (TD) status will be recorded in the course registration record, examination result slip, and student's transcript.
- (x) Registration of Minor Courses:
 - (a) A student with the approval of his Academic Advisor and the faculty offering the Minor Programme can register for any of the course offered as part of the Minor Programme.
 - (b) He must register for every minor course taken in a semester according to the rules, procedures and duration stipulated.
 - (c) Course grades will be calculated in the student's GPA and CGPA.
 - (d) Minor courses cannot be registered as Audit Course (HS).
- (xi) Students who fail to register courses within the specified time can be dismissed from the programme unless valid reasons are given and accepted by the University.
- (xii) Procedure, rules, and regulations pertaining to the registration of the courses are given in Appendix I.

5.5 CREDIT SCHEME

5.5.1 COURSE CREDIT

Each course has a credit value to signify the importance, learning time and the nature of the course.

5.5.2 CREDIT VALUE

- (i) The credit value of courses may vary depending on the nature of courses as shown in the following table:

Table 2: Credit Value

Type of Delivery	Credit Value	Total No. of Contact Hours Per Semester	Total No. of Student Learning Time Per Credit
Lectures	1	14	40
Laboratory / Studio / Project / Fieldwork	1	28 to 40	40

Note: The total number of student learning time includes lecturer, practical/studio/project/tutorial and independent study.

- (ii) Credit for Industrial Training
- (a) Industrial Training is given a Compulsory Attendance status (Hadir Wajib - HW).
 - (b) A value of **ONE (1) credit** for Industrial Training is equivalent to at least **TWO (2) weeks of training.**
 - (c) The credit value of a course based on work-based learning (WBL) is according to the effective learning time involving theoretical learning, self-learning, learning with industry guidance and assessment during work and beyond working hours. Therefore, the value of **ONE (1) WBL credit is equivalent to 50 hours of effective learning time.**

5.5.3 CREDIT LOAD FOR EACH SEMESTER

- (i) Students with Good Status (KB) must register for not less than the total minimum credit, i.e., TWELVE (12) credits and not more than EIGHTEEN (18) credits. This includes the Audit Course (HS) and the Compulsory Attendance (HW) course in a semester.
- (ii) Students who are in the final TWO (2) semesters of their study are not subjected to item (i)
- (iii) Students who wish to take more than EIGHTEEN (18) credits must obtain approval from the Dean. However, student is not allowed to take more than TWENTY-TWO (22) credits per semester. However, students are **NOT** allowed to take more than TWENTY-ONE (21) credits in a semester.
- (iv) Students with Probation Status (KS) are allowed to take between NINE (9) and TWELVE (12) credits only in the following semester.
- (v) Students who wish to enroll in a Short Semester are allowed to take a maximum of EIGHT (8) credits only.

5.5.4 CREDIT EARNED

- (i) Credit Earned is defined as credit of the Passed course including the Compulsory Attendance (HW) course but not the Hadir Sahaja (HS) course.
- (ii) For students who are given Credit Transfer, the Credit Earned is the sum of the total transferred credit and the Passed credit.

5.5.5 CREDIT COUNTED

Credit Counted is the credit taken in the current and in all semesters which are used to calculate the GPA and CGPA respectively. The credit of the HS and HW courses are not included in the Credit Counted.

5.5.6 CREDIT EXEMPTION

- (i) Students are awarded Credit Exemption if they possess:
 - a. A qualification from any accredited institution equivalent to the University's certificate, diploma, or degree; or
 - b. Working experience that has been recognized by the Senate as equivalent to certain courses offered at certificate or diploma or university degree level; or
 - c. Students who change their study programme within the university or from another institution of higher learning.
- (ii) Application for Credit Exemption must be made together with the application for admission to the University or not later than week THREE (3) during the first semester of study.
- (iii) Students are not allowed to register for courses which have been given credit exemption.
- (iv) No Credit Exemption will be given for any Minor Programme.
- (v) Rules and regulations pertaining to Credit Exemption are as in Appendix II.

5.5.7 CREDIT TRANSFER

- (i) The Credit Transfer pertains to the cross-campus programme.
- (ii) Students can request for a transfer of credit provided that:
 - a. The course is taken in another institute of higher learning (IPT) approved by the University during the programme of study at the University; and
 - b. The request for transfer of credit is done during the semester in which the course is taken in that IPT.
- (iii) Rules and regulations pertaining to Credit Exemption are as in Appendix II.

5.5.8 CREDIT FOR FAILED COURSE

- (i) Students who fail any core (compulsory) course must retake and pass that course. In calculating the CGPA, only the final credit and the Passed grade point of the course will be taken into consideration. The previous Failed credit and grade point will automatically be removed.
- (ii) Failed elective courses can be taken again or replaced with other elective courses and will still be calculated in the GPA and CGPA.
- (iii) Failed Minor courses may not necessarily be repeated but the credit and grade point of the courses will still be counted in the GPA and CGPA.

5.5.9 CREDIT FOR GRADUATION AND DURATION OF STUDY

- (i) The Credit for Graduation and the normal duration of study of the study programme are determined by the Faculty, with the approval of the Senate.
- (ii) Students must pass all required courses listed in the curriculum of the study programme.
- (iii) The calculation of total Credits for Graduation will not consider the credits obtained from any Minor Course.

- (iv) The maximum duration of study is the regular duration specified for the study programme plus additional FOUR (4) semesters.
- (v) For direct entry students, the maximum duration of study is determined by the faculty based on the approval total number of credit exemptions given.
- (vi) Credit of Graduation and Duration of Study for a Minor programme:
 - a. Students must pass all courses required for a particular minor programme
 - b. There is no additional number of semesters added to the maximum duration of study for students registering for a minor programme
- (vii) The total minimum credit and maximum period to complete the programme is as shown in Table 3.

Table 3 : The total minimum credit and maximum period

Total No. of Credit Exemptions (CE)	Maximum Duration (Semester)
<20	(Normal duration +4) – 0
20 - 33	(Normal duration +4) – 1
34 - 50	(Normal duration +4) – 2
51 – 67	(Normal duration +4) – 3
>68	(Normal duration +4) – 4

5.5.10 VERTICAL CREDIT TRANSFER

- (i) Vertical credit transfer can be given to students who have diplomas and degree recognised by the Senate.
- (ii) The limit of vertical credit transfer that may be granted cannot exceed 30% (or according to the percentage set by the relevant Professional Bodies) of the total number of credits required for the award of a degree.
- (iii) Applications for vertical credit transfer should be made when applying for the programme.
- (iv) Only courses with a minimum grade C can be considered for vertical credit transfer. The Faculty may specify a higher minimum grade (if necessary).
- (v) Students are not allowed to register for a course that has been granted a vertical credit transfer. If students still register, it will be cancelled.
- (vi) Vertical credit transfer is not allowed from a higher level to a lower-level programme.
- (vii) Vertical credit transfer is not allowed for any course in minor programme.
- (viii) Vertical credit transfer will be re-evaluated if there is a change in a student's programme.
- (ix) A guide to vertical credit transfer is stated in Appendix IV.

5.5.11 HORIZONTAL CREDIT TRANSFER

- (i) Students who are taking courses through the student mobility programme at other IHLs recognised by the Senate can apply for Horizontal Credit Transfer.
- (ii) The course that is given the horizontal credit transfer is a course that has been approved by the Faculty before the students join the mobility programme.
- (iii) There is no limit to horizontal credit transfer between programmes within the University.
- (iv) Students from other IHLs in Good Status (KB) may be considered for horizontal credit transfer at the University.

- (v) The limit of horizontal credit transfer allowed from other IHLs is not more than 50% of the total credit for graduation.
- (vi) Horizontal credit transfer will be re-evaluated if there is a change in a student's programme.
- (vii) Students are required to register for all the courses to be transferred during the current semester.
- (viii) Students should inform the Faculty of the grade obtained for all of the courses they enrol in as soon as they receive the results from the IHL.
- (ix) For the same programme, horizontal credit transfer can be considered for Good Status (KB) students who withdraw from study. This is subject to a period not exceeding three (3) years from the date of withdrawal. The original record of the student is retained and the number of semesters that can be used is the balance of the predetermined number of semesters. This process can only take place once during study for the programme.
- (x) As per Item 6.9, for a different programme, the number of semesters that can be used is subject to the amount of approved horizontal credit transfer as shown in Table 3.
- (xi) Students who opt to use horizontal credit transfer facility must fulfill the period of residence of at least TWO (2) regular semesters at the University.
- (xii) Students may apply for a horizontal credit transfer through APEL(C) without bringing a grade. The maximum credit is subject to 30% of the total credit for graduation.
- (xiii) Students may apply for horizontal credit transfer for MOOC courses if they pass a qualification test set by the University for the course. The maximum number of credits is subject to 30% of the total credit for graduation.

5.6 GRADING SYSTEM

- (i) The performance of a student in a course is represented by the grade obtained. The relationship between the marks, grade and grade point is as listed in Table 4.

Table 4: Relationship between Marks, Grade and Grade Points

Marks Points	Grade	Grade
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
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- (ii) Table 5 describes the meaning of each grade obtained by students for a course.

Table 5 : Course Grade Description

Marks	Grade Points	Grade	Explanation
90 – 100	4.00	A+	Shows an outstanding performance beyond the highest standards. Course content has been fully mastered. Able to apply the knowledge acquired through various approaches and showcase exceptional understanding in a wider and comprehensive context.
80 – 89	4.00	A	Shows an excellent performance that meets the highest standards. Course content has been mastered very well. Able to apply the knowledge gained through various approaches and show clear understanding in a holistic context.
75 – 79	3.67	A-	Demonstrate excellent performance that meets the high standards. Course content has been well-mastered. Able to apply the knowledge gained through various approaches and show clear understanding.
75 – 79	3.67	A-	Demonstrate excellent performance that meets the high standards. Course content has been well-mastered. Able to apply the knowledge gained through various approaches and show clear understanding.
70 – 74	3.33	B+	Demonstrate a very good performance that meets the high standards. Course content has been mastered with a holistic understanding of concepts and techniques.
65 – 69	3.00	B	Demonstrate good performance that meets the standards. Course content has been mastered with a good understanding of concepts and techniques.
60 – 64	2.67	B-	Fulfill the standards as well as show a good understanding of the course content and the mastery of course content. Most of the specified course

			content can be mastered.
55 – 59	2.33	C+	Demonstrate satisfactory understanding of course content. Fulfill or in certain circumstances exceed basic standards.
50 – 54	2.00	C	Demonstrate sufficient understanding of course content and meet basic standards.
45 – 49	1.67	C-	Demonstrate a minimum level of understanding of course content and in certain circumstances do not meet basic standards.
40 – 44	1.33	D+	Demonstrate minimum understanding of the course content.
30 – 34	0.67	D-	Demonstrate weak understanding of course content. Student fails in the course.
0 – 29	0.00	E	Demonstrate that students cannot understand course content. Student fails in the course.

(iii) Table 6 describes the meaning of each grade obtained by students for a practical course.

Table 6 : Practical Course Grade Description

Marks	Grade Points	Grade	Explanation
90 – 100 80 – 89 75 – 79	4.00 4.00 3.67	A+ A	Excellent <ul style="list-style-type: none"> • Demonstrate excellent knowledge and performance based on the ability to apply theory to practical work • Demonstrate automatic and spontaneous work skills • Master the skills identified excellently
70 – 74 65 – 69 60 – 64	3.33 3.00 2.67	B+ B B-	Good <ul style="list-style-type: none"> • Demonstrate good knowledge and performance based on the ability to apply theory to practical work • Demonstrate skillful, optimal and efficient work skills • Master the identified skills well
55 – 59 50 – 54 45 – 49	2.33 2.00 1.67	C+ C C-	Average <ul style="list-style-type: none"> • Demonstrate average knowledge and performance based on the ability to apply theory to practical work • Demonstrate work skills with minimum guidance • Master the identified skills

			moderately
35 – 39	1.00	D	Fail <ul style="list-style-type: none"> • Failure to demonstrate knowledge in applying the theory to practical work • Not able to perform the work even with guidance • Failure to master identified skills
30 – 34	0.67	D-	
0 – 29	0.00	E	

- (iv) Generally, Grade D+ is the minimum passing grade. However, the passing grade of a course is subject to the requirements of the Faculty with the Senate's approval.
- (v) Besides the grades listed above, the following grading is also used:

Table 7 : Description of Grade Points without Value

Grade	Explanation
HS (Audit)	Grade given for courses registered with HS status
HL (Pass)	Passing grade given to course registered with HW status
HG (Fail)	Failing grade given to course registered with HW status

- (vi) Grade for Industrial Training is Pass (HL) or Fail (HG).
- (vii) In addition to the above grades, temporary grades like Incomplete (TS) and Incomplete (Student Mobility) TS(KM) may be assigned for the purpose of administering the academic records of students.
- (viii) Incomplete (TS) status will be given to a course because:
- Students do not take final examinations due to illness, or
 - Students do not complete a course due to illness, or
 - Students undergo Industrial Training/Practicum, or
 - Other reasons that are acceptable by the Senate.
- (ix) All temporary grades (TS) will be converted to a grade before the Senate Standing Committee Meeting (Special Examination) of the semester after the student completes Item 1.8.
- (x) For students who join student mobility programmes outside UTM, the grade TS(KM) for each course will be given if the results are not obtained from the university offering the courses in the semester registered at UTM.
- (xi) All temporary grades TS(KM) will be converted to a grade before the Senate Standing Committee Meeting (Examination) of the following regular semester.

5.7 ASSESSMENT SYSTEM

5.7.1 ATTENDANCE REQUIREMENT

- (i) Students must attend all forms of scheduled face-to-face learning activities (lectures/practical/studio/fieldwork etc.). If students do not attend these activities, they will have to inform their lecturers immediately and provide reasons for their absence.

- (ii) Lecturers need to report to the Faculty if there are students who have been absent for more than 20% of the total scheduled contact hours of learning activities.
- (iii) The Faculty needs to issue a warning letter to the students after receiving a report from lecturers.
- (iv) Students who attend less than 80% of the total scheduled contact hours of a course in a semester without any reason acceptable to the University, are not allowed to attend all subsequent forms of scheduled face-to-face learning activities and sit for any form of assessment. ZERO (0) mark will be awarded for the said courses; or Fail (HG) for compulsory audit courses (HW) and courses registered as audit (HS) will not be recorded in the transcript.
- (v) The Faculty will inform the students in writing of the results of the action as stated in item (iv).

5.7.2 ASSESSMENT SCHEME

- (i) Ongoing assessment of a course will be done through coursework, final examinations and other forms of assessment during the semester of study according to the methods and weightings determined by the Faculty.
- (ii) Assessment for Industrial Training and Final Year Project is based on the format determined by the Faculty.
- (iii) For courses that are assessed based on coursework and final examination, the coursework mark must not be less than 50% of the total marks whereas the final examination mark should not exceed 50% unless approval has been obtained from the Faculty.
- (iv) Assessment of courses based on 100% coursework can be implemented with the approval of the Faculty.
- (v) Application for approval by the course coordinator/lecturer for Item (iv) should be made before the semester begins.

5.7.3 FINAL EXAMINATION

The final examination must be conducted within a specific time frame, according to guidelines set by the University as in Appendix IV.

5.7.4 SPECIAL EXAMINATION

- (1) Special Examination can be held for the following cases:
 - (i) Students who are unable to sit for the final examination because of illness and validated by a medical officer from the university or government hospital or have given reasons accepted by the university; or
 - (ii) Students in their final semester who have passed with Good Standing (GS)[KB] but failed in ONE (1) course taken in the last TWO (2) semesters of study not including the semester used for Practical/Industrial Training.
- (2) The special examination mark will be used to determine the results of the course based on the following:
 - (i) The special examination mark as in para (1) (i) will be used to replace the previous final examination mark whereas the coursework marks remain the same.
 - (ii) Students as in para (1) (ii) who have passed the special examination with

a grade D + or a passing grade set by the faculty will be calculated as part of their GPA and CGPA. Students who have been given Grade D will have to repeat the course.

- (3) Special Examination will not be held for the following cases:
 - (i) Courses that have no final examination; or
 - (ii) Students who did not sit for the final examination and gave reasons that are not accepted by the university; or
 - (iii) Students who have been barred from sitting for the final examination
- (4) Special Examination will only be conducted once in a semester unless with the approval of the Senate.
- (5) Students who fail to sit for the Special Examination for item (5.6.4 (1)) will be given ZERO (0) mark for the final examination.

5.7.5 RELEASE OF EXAMINATION RESULT

- (i) Students may contact the respective lecturers directly if they feel that a mistake has been made on their grades within FIVE (5) working days after the end of the final examination week.
- (ii) Students may check their examination answer scripts and discuss with the lecturer if they are not satisfied with the results.

5.7.6 APPEAL ON THE RESULTS

- (i) If students are not satisfied with the results of the review of their scripts, they may apply for a course grade appeal. The script will be reassessed and re-marked. Students may only apply for a course grade appeal after they have reviewed and discussed the answer scripts with the respective lecturers.
- (ii) Students may apply for a course grade appeal for any course to the Faculty no later than TEN (10) working days after the end of the final examination week.

5.7.7 ACADEMIC STANDING

- (i) A student's performance is assessed based on the TWO (2) measurements GPA and CGPA which are as follow:

$$\text{GPA} = \frac{\text{Total Grade Point per Semester}}{\text{Total No. of Attempted Credit per Semester}}$$

$$\text{CGPA} = \frac{\text{Total Credit Point for all semesters}}{\text{Total No. of Credit Counted of all semesters}}$$

- (ii) The academic standing of a student at the end of every semester is based on the CGPA as shown in Table 7 below:

Table 7: Academic Standing Based on CGPA

Status	CGPA
Good Standing Status (KB)	CGPA \geq 2.00
Probation Status (KS)	1.70 \leq CGPA < 2.00
Fail Status (KG) (Study Terminated)	CGPA < 1.70

- (iii) Students who obtain GPA < 1.00 even though the CGPA \geq 1.70 may continue with their studies. However, the Senate can:
 - (a) Defer their studies to the following semester: or

- (b) Give a Fail Status (KG) and terminate their studies.
- (iv) Students who obtained THREE (3) consecutive Probation Status (KS) will be given a Fail Status (KG) and they will be terminated from their studies.
- (v) Students who have completed their studies but do not meet the requirements of the award will be given a Fail Status (KG) and terminated from their studies.
- (vi) The academic standing of a student for the Short Semester will not be ascertained. The grade obtained in that semester will be considered for the calculation of the CGPA in the first semester of the following session.
- (vii) The status of the student's academic standing who enroll in the student mobility programme outside UTM with the Unfinished Status (Student Mobility) TS(KM) for that semester is not specified. Grades obtained in the semester will be considered for the calculation of CGPA in the next semester.
- (viii) Students may be given a temporary result if they do not meet the requirements of the University as shown in Table 8.

Table 8: Other Academic Standing

Status	Description
KB (BM)	Students are in Good Status and pass all courses required in the curriculum of the programme but have not fulfilled the Bahasa Melayu requirement
KB (MU)	Students are in Good Status and pass all courses required in the curriculum of the programme but have not sat for MUET
KB (TK)	Students are in Good Status and pass all courses required in the curriculum of the programme but have not applied for an award of a degree
KB (PSC)	Students are in Good Status and pass all courses required in the curriculum of the programme but have not fulfilled the requirements of PSC
TS	No final examination/evaluation mark in at least one course for the student and must be completed within the current semester
TS (KM)	No mark because students enroll in the mobility programme and need to be completed within the current semester of next regular semester

5.7.8 IMPROVING ACADEMIC PERFORMANCE

- (i) Students are given the chance to improve their grades with the faculty's approval during their study according to the following conditions:
- obtain faculty's approval;
 - improve the grade of the course which is B- and below;
 - allowed to improve only once the grade of the course;
 - the better grade between the original and the latest grade will be used in the GPA and CGPA calculation; and
 - request for improving grade will have to be accompanied with grade improvement registration payment determined by the Senate.
- (ii) Students who have completed their study but have not fulfilled the requirements for an award such as Good Status (GS) [KB] (Completed

Program) will not be allowed to improve the grade of their course.

5.7.9 ANNOUNCEMENT OF STUDENT ACADEMIC STANDING

The academic standing of students will be announced through the modes adopted by the university.

5.8 COMPUTATION OF GPA AND CGPA

(i) Grade Point Average (GPA):

- (a) The GPA is the average grade points obtained in a semester.
- (b) The GPA is calculated as follows:

$$\text{GPA} = \frac{\text{Total Grade Points (TGP)}}{\text{Total Credit Count (TCC)}}$$

$$\text{GPA} = \frac{k_1 m_1 + k_2 m_2 + \dots}{k_1 + k_2 + \dots}$$

$$\begin{aligned} \text{Total Grade Points (TGP)} &= k_1 m_1 + k_2 m_2 + \dots \\ \text{Total Credit Counted (TCC)} &= k_1 + k_2 + \dots \end{aligned}$$

$$\begin{aligned} k_1, k_2, \dots &= \text{Credit value for each course taken} \\ m_1, m_2, \dots &= \text{grade points obtained for each course taken} \end{aligned}$$

(ii) Cumulative Grade Points Average (CGPA)

- a. The CGPA is the grade point average obtained overall semesters
- b. The CGPA is calculated as follows:

$$\text{CGPA} = \frac{\text{Total Grade Points (TGP)}}{\text{Total Credit Count (TCC)}}$$

$$\text{CGPA} = \frac{\text{TCP}_1 + \text{TCP}_2 + \dots}{\text{TCC}_1 + \text{TCC}_2 + \dots} =$$

(TGP) = TCP₁ + TCP₂ + ... = Total Credit Points obtained in each semester

(TCC) = TCC₁ + TCC₂ + ... = Total Credit Counted in each semester

Total Credit Counted for semester 1 = 15

Total Grade Counted for semester 1 = 55.55

Example of CGPA calculation

Course	Credit Counted (k)	Marks (%)	Grade	Grade Point (m)	Total Grade Points(kxm)
SEAA 1023	3	86	A	4.00	12.00
SEAA 1422	2	80	A	4.00	8.00
SEAA 1513	3	86	A	4.00	12.00
SSCE1793	3	76	A-	3.67	11.01
SSCE1993	3	72	B+	3.33	9.99

UICI1012	2	86	A	4.00	8.00
UKQ# 2##2	2	90	A+	4.00	4.00
	18				65.00

Total Credit Counted (TCC) for semester 2 = 18

Total Grade Points (TGP) for semester 2 = 65.00

$$\text{GPA for semester 2} = \frac{65.00}{18} = 3.61$$

$$\text{CGPA for semester 2} = \frac{55.00 + 65.00}{15 + 18} = 3.75$$

(iii) Example of GPA calculation for first year student:

Semester 1

Course	Credit Counted (k)	Marks (%)	Grade	Grade Point (m)	Total Grade Points (kxm)
SEAA 1012	2	78	A-	3.67	7.34
SEAA 1213	3	72	B+	3.33	9.99
SEAA 1713	3	80	A	4.00	12.00
SSCE 1693	3	75	A-	3.67	11.01
ULAB 1122	2	89	A	4.00	8.00
UHAS 1172	2	71	B+	3.33	6.66
	15				55.00

Total Credit Counted (TCC) = 15

Total Grade Points (TGP) = 55.00

$$\text{GPA} = \frac{\text{Total Grade Points (TGP)}}{\text{Total Credit Count (TCC)}} = \frac{55}{15} = 3.67 \text{ for semester 1, CGPA = GPA}$$

5.9 STATUS OF STUDENTS' ACADEMIC YEAR

Students' academic year will be determined by the faculty according to the total Credit Earned as shown in Table 8

Table 8 : Minimum Credit Earned for Advancement

Year	Credit Obtained
1	0-33
2	34-66
3	67-104
4	105-135

5.10 AWARD AND RECOGNITION

(i) **The Royal Academic Prize**

The prize is contributed by the Office of the Keeper of the Royal Seal. The prize is awarded to one (1) Bumiputra and ONE (1) Non-Bumiputra graduates who have obtained a First Class Degree and are actively involved in academic and co-curricular activities.

(ii) **The Chancellor's Award**

This award is bestowed to the best TWO (2) graduates who have obtained a First-Class Honours Degree and are actively involved in academic and Co-Curriculum activities. The award consists of cash, a certificate, and a medal.

(iii) **The Vice-Chancellor's Award**

This award is bestowed to the best graduate who has obtained a First-Class Honours Degree from each faculty and is actively involved in academic and Co-Curriculum activities. The award consists of cash, a certificate, and a medal.

(iv) **The Alumni's Prize**

The prize is given to the best graduate from each faculty. The prize consists of cash and a certificate.

(v) **The Academic Prize**

The prize is given to the best graduate for each programme in each faculty. The prize is contributed by Statutory and Professional Bodies and Private Companies. The prize consists of cash, a medal and a book or Certificate of Appreciation

(vi) **The Dean's List**

A student who obtains a GPA of 3.50 and above will be awarded a Dean's List Certificate, if he/she has registered for at least 12 credit hours for that semester excluding courses with HS and HW status. The remark "Dean's List" will be printed on the student's transcript.

5.11 CONFERRAL OF THE DEGREE

5.11.1 CONFERRAL REQUIREMENTS

The Senate normally endorses degree conferral in two regular semesters. Nevertheless, based on certain reasons, the Senate may approve degree conferral in short semester.

- i. Students are only qualifying for the conferral of their degree after fulfilling the following requirements:
 - (a) Obtain a Good Status (GS) [KB]
 - (b) Passed all required courses.
 - (c) Have applied for a degree conferral and have received the faculty's approval
 - (d) Fulfill other requirements.
- ii. Students are eligible to have a remark of Minor in a particular programme in their transcripts after:
 - (a) Passing all courses required for the Minor programme
 - (b) Having applied for a Minor conferral and have obtained the offering faculty's approval.

5.11.2 APPLICATION FOR THE DEGREE CONFERRAL

- i. Students who have fulfilled all the requirements for graduation must submit application for a degree conferral within a specific period in a particular semester. A fine will be imposed on late application.
- ii. Students who do not apply for the conferral of degrees within the specific period will only be awarded with a Good Status (Completed Study). The students can apply for the degree conferral in the following semesters.
 - (a) Students who are given above (ii) status but do not apply for degree conferral within FIVE (5) years after completing their study will not be awarded the degree except with the Senate's approval.
 - (b) Students who do not meet the requirements for the degree conferral, yet submit application for the degree conferral, will be fined.
 - (c) Students who have fulfilled passing requirements for Minor programme must submit the application for Minor programme conferral together with the application for the degree conferral.
 - (d) Guidelines and the application procedures for the degree conferral are given in Appendix VI.

5.11.3 EQUIVALENT CLASSIFICATION OF THE DEGREE

The classifications of Degree conferred to students are based on their final CGPA obtained as shown in Table 9:

Table 9: Classification of Degree

CGPA	Degree Classification
CGPA > 3.67	First Class Honours
3.00 < CGPA < 3.67	Second Class Honours
2.00 < CPGA < 3.00	(Upper)

	Second Class Honours (Lower)
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5.12 DEFERMENT OF STUDY

- (i) A student who has been diagnosed as having illness by a Medical Officer of the or by any Government Hospital is entitled to request for deferment of study. This deferment will not be counted as part of the total number of semesters in the calculation of his/her Duration of Study.
- (ii) The maximum length for deferment for each application is TWO (2) continuous semesters. However, if the student requires more than FOUR (4) continuous semesters, the case will be referred to the University Medical Panel to decide whether this student will be allowed to continue with the study or have his study terminated.
- (iii) A student can also request for deferment of study for non-medical reasons. The application must be made before the last working day of week NINE (9) of the semester. The non-medical deferment period will be counted as part of the total number of semesters in the calculation of his/her maximum Duration of Study.
However, if recommended by the Dean of the Faculty and approved by the Deputy Vice Chancellor (Academic and Internationalization) the deferment period may be waived from being counted in the student's maximum Duration of Study.
- (iv) For a student who is deferred because of University's regulation (GPA < 1.00), the deferment period will be counted as part of the total number of semesters that the student has undergone. However, if recommended by the Dean of the Faculty and approved by the Deputy Vice Chancellor (Academic and Internationalization) the deferment period may be excluded from the calculation.
- (v) For a student who is deferred by the University due to disciplinary action, his/her deferment period will be counted as part of the student's maximum study period.

5.13 CHANGE OF PROGRAMME

Change of programme for full-time students is not encouraged. However, the University may consider an application to change the study programme by a full-time student within the same faculty or to another programme offered in another faculty provided that:

- (i) The change of programme is only applicable for those who have completing a minimum of ONE (1) semester at the University.
- (ii) The application for change of programme must be made no later than TWO (2) weeks after the examination results are released.
- (iii) The academic performance of the student must not be Failed Status (FS) [KG].
- (iv) For change of programme involving two almost similar Degrees, the student's previous academic records will be maintained, and the student is considered as continuing student.

- (v) For change of programme involving two different Degrees (from a Degree to a Diploma), all previous academic records of the student will be closed, and a new record keeping will be established subject to Credit Exemption regulation. The maximum Duration of Study for the student is also subject to Credit Exemption transferred by the Faculty.
- (vi) Change of programme is allowed only once during the whole duration of the programme of study.

5.14 ACADEMIC MISCONDUCT

- (i) Students who have committed misconduct or academic wrongdoing will be penalized according to the University and College University Acts, 1971, Procedures according to Universiti Teknologi Malaysia (Students Code of Conduct) 1999 or any other actions determined by the university.
- (ii) Students are not allowed to commit the following academic misconducts: -
 - (a) Copy/plagiarize such as copy phrases, ideas, or information without citing the original sources; or
 - (b) Misbehave and suspicious behavior during an examination; and/or
 - (c) Any form of wrongdoing or attempts of academic cheating other than the above.

5.15 GENERAL PROVISIONS

- (i) All Academic Rules and Regulations must be observed. The Senate is entitled to the Rules and Regulations as deemed appropriate.
- (ii) The Appendices and Tables in this Academic Guidelines will become part of the current Academic Regulations.
- (iii) Should any dispute arise, the regulations stated in this Academic Guidelines will apply.
- (iv) The information in this book is correct at the time it is published.

6. CURRICULUM AND SYLLABUS

6.1 Area of study

In general, civil engineering deals with the design, construction and maintenance of the physical and natural built environment including works such as bridges, roads, canals, dams, and buildings. It also includes water resources management, water works, waste management, and environmental pollution control for the use and benefit of mankind. Civil engineering programme at UTM encompasses the following areas of study:

(i) **Science and Mathematics**

Science and Mathematics courses are required to prepare students with strong fundamentals, which are prerequisites to the engineering fields.

(ii) **Civil Engineering**

Students will be given basic training and knowledge in civil engineering study. The courses cover four main areas in civil engineering, namely structures and materials, geotechnics and transportation, hydraulics, hydrology and water resources, and environmental engineering and management.

(iii) **Civil Engineering Elective Courses**

Final Final-years are required to take three advanced courses in the civil engineering field which are equivalent to courses offered at the graduate level elective courses to develop an area of expertise which is of interest to the students.

(iv) **Humanities and Social Science Courses**

Humanities and social science courses are taught to students as the basis for moral education towards becoming responsible, dedicated, and ethical, as well as competent individuals. Courses in these areas also enable students to understand and appreciate the values and diverse cultures of various races in Malaysia and other nations.

(v) **Co-curricular Courses**

Students are required to attend co-curricular courses of their choice. The courses are developed to instill leader hostilities as well as to produce resilient individuals.

6.2 Bachelor of Engineering (Civil) Curriculum

The curriculum for the Bachelor of Engineering (Civil) is given in the following tables. The courses are arranged according to the semester in which they are offered. Students are strongly encouraged to enroll in the courses according to the proposed arrangement. Students may not graduate on time should they fail or withdraw from the courses offered.

6.2.1 Course Menu for Group 1

COURSE MENU FOR GROUP 1

Year 1 Semester 1

Code	Course	Credits	L	T	P/S	Lab
SEAA 1011	Introduction to Civil Engineering	1				
SEAA 1213	Engineering Mechanics	3	3	1		
SEAA 1513	Fluid Mechanics	3	3	1		
SSCE 1693	Engineering Mathematics I	3	3	1		
UHLB 1112*	English Communication Skills	2	2			
ULRS1182	Appreciation Of Ethics & Civilizations	2	2			
UHLM 1012	Malay Language for Communication 2 (For International Students Only)	2				
Total Credits		14				
Cumulative Credits		14				

Year 1 Semester 2

Code	Course	Credits	L	T	P/S	Lab
SEAA 1023	Engineering Surveying	3	3			
SEAA 1422	Engineering Drawing	2			4	
SEAA 1713	Soil Mechanics	3	3	1		
SSCE 1793	Differential Equations	3	3	1		
SSCE 1993	Engineering Mathematics II	3	3	1		
ULRS 1012	Value and Identity	2				
Total Credits		16				
Cumulative Credits		30				

Year 1 Short Semester

Code	Course	Credits	P/S
SEAA 1031	Surveying Camp	1	Two weeks
Cumulative Credits		31	

Year 2 Semester 1

Code	Course	Credits	L	T	P/S	Lab
SEAA 2012	Civil Engineering Laboratory 1	2				4
SEAA 2032	Mechanical and Electrical Systems	2	2			
SEAA 2513	Hydraulics	3	3	1		
SEAA 2722	Geotechnics 1	2	2	1		
SEAA 2832	Highway Engineering	2	2	1		
SEAA 2912	Water Treatment	2	2	1		
SSCE 2393	Numerical Methods	3	3	1		
UHLB 2122	Academic Communication Skill	2	2			
Total Credits		18				
Cumulative Credits		49				

Year 2 Semester 2

Code	Course	Credits	L	T	P/S	Lab
SEAA 2112	Civil Engineering Materials	2	2			
SEAA 2223	Mechanics of Materials and Structures	3	3	1		
SEAA 2413	Computer Programming	3				
SEAA 2712	Engineering Geology and Rock Mechanics	2	2	1		
SEAA 2922	Wastewater Engineering	2	2	1		
SSCE 2193	Engineering Statistics	3	3	1		
ULRF 2**2	Service Learning & Engagement Courses	2				
ULRS 1022	Philosophy & Current Issues (Local Students)	2				
Total Credits		19				
Cumulative Credits		68				

Year 3 Semester 1

Code	Course	Credits	L	T	P/S	Lab
SEAA 3123	Construction Technology, Contract & Estimating	3				
SEAA 3243	Theory of Structures	3	3			
SEAA 3313	Reinforced Concrete Design 1	3	3			
SEAA 3412	Building Information Modelling and Data Management	2				
SEAA 3712	Geotechnics 2	2	2			
UHLX 1**2	Foreign Language for Communication	2				
ULRS 3032	Entrepreneurship & Innovation	2				
Total Credits		17				
Cumulative Credits		85				

Year 3 Semester 2

Code	Course	Credits	L	T	P/S	Lab
SEAA 3012	Civil Engineering Laboratory 2	2				4
SEAA 3022	Integrated Design Project 1	2				
SEAA 3323	Structural Steel & Timber Design	3	2		2	
SEAA 3613	Hydrology and Water Resources	3	3			
SEAA 3842	Traffic Engineering	2	2			
SEAA 3913	Environmental Management	3	3			
UHLB 3132	English for Professional Purpose	2	2			
Total Credits		17				
Cumulative Credits		102				

Year 3 Short Semester

Code	Course	Credits	P/S
SEAA 3045	Industrial Training	5	12 weeks
Cumulative Credits		107	

Year 4 Semester 1

Code	Course	Credits	L	T	P/S	Lab
SEAA 4021	Civil Engineering Seminar	1	1			
SEAA 4022	Research Methodology and Pre-Project	2	2		2	
SEAA 4223	Structural Analysis	3	2			1
SEAA 4##3	Elective 1	3	3			
SEAA 4##3	Elective 2	3	3			
***3	OPEN ELECTIVE	3	3			
Total Credits		15				
Cumulative Credits		122				

Year 4 Semester 2

Code	Course	Credits	L	T	P/S	Lab
SEAA 4032	Integrated Design Project 2	2	2		2	
SEAA 4034	Final Year Project	4			8	
SEAA 4113	Constructions & Project Management	3	3			
SEAA 4333	Reinforced Concrete Design 2	3	2		2	
SEAA 4##3	Elective 3	3	3			
Total Credits		15				
		137				

Professional Skills Certificate

Code	Course	Credits	L	T	P/S	Lab
GLRL0010	MyLinE (Online Resources for Learning in English)					

Subject to change

Notes :- L - Lecture; T - Tutorial; P/S - Practical/Studio; Lab – Laboratory

6.2.2 Course Menu for Group 2

COURSE MENU FOR GROUP 2

Year 1 Semester 1

Code	Course	Credits	L	T	P/S	Lab
SEAA 1011	Introduction to Civil Engineering	1				
SEAA 1023	Engineering Surveying	3	3			
SEAA 1422	Engineering Drawing	2			4	
SEAA 1713	Soil Mechanics	3	3	1		
SSCE 1693	Engineering Mathematics I	3	3	1		
UHLB 1112*	English Communication Skills	2	2			
ULRS1182	Appreciation Of Ethics & Civilizations	2	2			
UHLM 1012	Malay Language for Communication 2 (For International Students Only)	2				
Total Credits		16				
Cumulative Credits		16				

Year 1 Semester 2

Code	Course	Credits	L	T	P/S	Lab
SEAA 1213	Engineering Mechanics	3	3	1		
SEAA 1513	Fluid Mechanics	3	3	1		
SSCE 1793	Differential Equations	3	3	1		
SSCE 1993	Engineering Mathematics II	3	3	1		
ULRS 1012	Value and Identity	2				
Total Credits		14				
Cumulative Credits		30				

Year 1 Short Semester

Code	Course	Credits	P/S
SEAA 1031	Surveying Camp	1	Two weeks
Cumulative Credits		31	

Year 2 Semester 1

Code	Course	Credits	L	T	P/S	Lab
SEAA 2112	Civil Engineering Materials	2	2			
SEAA 2223	Mechanics of Materials and Structures	3	3	1		
SEAA 2413	Computer Programming	3				
SEAA 2712	Engineering Geology and Rock Mechanics	2	2	1		
SEAA 2922	Wastewater Engineering	2	2	1		
SSCE 2193	Engineering Statistics	3	3	1		
UHLB 2122	Professional Communication Skills 1	2	2			
ULRF 2**2	Service Learning & Engagement Courses	2				
Total Credits		19				
Cumulative Credits		50				

Year 2 Semester 2

Code	Course	Credits	L	T	P/S	Lab
SEAA 2012	Civil Engineering Laboratory 1	2				4
SEAA 2032	Mechanical and Electrical Systems	2	2			
SEAA 2513	Hydraulics	3	3	1		
SEAA 2722	Geotechnics I	2	2	1		
SEAA 2832	Highway Engineering	2	2	1		
SEAA 2912	Water Treatment	2	2	1		
SSCE 2393	Numerical Methods	3	3	1		
ULRS 1022	Philosophy & Current Issues (Local Students)	2				
Total Credits		18				
Cumulative Credits		68				

Year 3 Semester 1

Code	Course	Credits	L	T	P/S	Lab
SEAA 3012	Civil Engineering Laboratory 2	2				4
SEAA 3123	Construction Technology, Contract & Estimating	3				
SEAA 3323	Structural Steel & Timber Design	3	2		2	
SEAA 3613	Hydrology and Water Resources	3	3			
SEAA 3842	Traffic Engineering	2	2			
SEAA 3913	Environmental Management	3	3			
ULRS 3032	Entrepreneurship & Innovation	2				
Total Credits		18				
Cumulative Credits		86				

Year 3 Semester 2

Code	Course	Credits	L	T	P/S	Lab
SEAA 3022	Integrated Design Project 1	2				
SEAA 3243	Theory of Structures	3	3			
SEAA 3313	Reinforced Concrete Design I	3	3			
SEAA 3412	Building Information Modelling and Data Management	2				
SEAA 3712	Geotechnics II	2	2			
UHLB 3132	English for Professional Purpose	2				
UHLX1**2	Foreign Language for Communication	2				
Total Credits		16				
Cumulative Credits		102				

Year 3 Short Semester

Code	Course	Credits	P/S
SEAA 3045	Industrial Training	5	12 weeks
Cumulative Credits		107	

Year 4 Semester 1

Code	Course	Credits	L	T	P/S	Lab
SEAA 4022	Research Methodology and Pre-Project	2	2		2	
SEAA 4032	Integrated Design Project 2	2	2		2	
SEAA 4113	Constructions & Project Management	3	3			
SEAA 4333	Reinforced Concrete Design 2	3	2		2	
SEAA 4##3	Elective I	3	3			
SEAA 4##3	Elective II	3	3			
Total Credits		16				
Cumulative Credits		123				

Year 4 Semester 2

Code	Course	Credits	L	T	P/S	Lab
SEAA 4021	Civil Engineering Seminar	1	1			
SEAA 4034	Final Year Project	4			8	
SEAA 4223	Structural Analysis	3	2			1
SEAA 4##3	Elective III	3	3			
***3	OPEN ELECTIVE	3	3			
Total Credits		14				
Cumulative Credits		137				

Professional Skills Certificate

Code	Course	Credits	L	T	P/S	Lab
GLRL0010	MyLinE (Online Resources for Learning in English)					

Subject to change

Notes :- L - Lecture; T - Tutorial; P/S - Practical/Studio; Lab – Laboratory

6.3 List of Faculty's Elective Courses

6.3.1 Elective Courses

Apart from the core course, students must also take 9 credits of elective course.

1. Materials, Management and Construction

- SEAA 4143 Construction Plants and Equipment
- SEAA 4163 Concrete Technology

2. Structural Analysis and Design

- SEAA 4243 Finite Element Method
- SEAA 4263 Earthquake and Wind Engineering
- SEAA 4313 Advanced Reinforced Concrete Design
- SEAA 4323 Prestressed Concrete Design
- SEAA 4383 Analysis and Design of Tall Building Systems

3. Information Technology

- SEAA 4433 Advanced Computer Programming
- SEAA 4463 Construction Integration Environment
- SEAA 4473 Geographic Information System

4. Hydraulics and Hydrology

- SEAA 4523 Coastal Engineering
- SEAA 4613 Water Resources Management
- SEAA 4633 Urban Stormwater Management

5. Geotechnics and Transportation

- SEAA 4713 Geotechnical Analysis and Design
- SEAA 4723 Engineering Rock Mechanics
- SEAA 4733 Advanced Foundation Engineering
- SEAA 4743 Advanced Rock Mechanic and Engineering Geology
- SEAA 4753 Geological Engineering and Environment
- SEAA 4763 Tunnel Engineering
- SEAA 4813 Pavement Design and Construction
- SEAA 4823 Transportation Planning
- SEAA 4843 Advanced Road Material

6. Environmental Engineering

- SEAA 4923 Advanced Water and Wastewater Treatment
- SEAA 4943 Solid Waste Management
- SEAA 4973 Industrial and Hazardous Waste Treatment
- SEAA 4983 Water Quality Management

6.3.2 PRISMS Elective Courses

For students who intend to enroll into the PRISMS programme, refer to the PRISMS Section for a list of related elective courses associated with the Postgraduate Programmes.

1. Construction Management

- SEAA 5113 Construction Law and Contract
- SEAA 5123 Construction Site Management and Safety Control
- SEAA 5133 Sustainability & Environment Management in Construction

2. Project Management

- SEAA 5143 Fundamental of Project Management
- SEAA 5153 Project Planning & Scheduling
- SEAA 5163 Project Financial Management
- SEAA 5173 Laws in Forensic Engineering

3. Structure

- SEAA 5213 Advanced Structural Analysis and Modelling
- SEAA 5223 Risk Assessment
- SEAA 5233 Structural Dynamics
- SEAA 5323 Advanced Design of Steel Composite Structures
- SEAA 5333 Principles of Forensic Engineering
- SEAA 5343 Safety Engineering
- SEAA 5353 Prevention Through Design

4. Hydraulics and Hydrology

- SEAA 5513 Advanced Hydraulics
- SEAA 5613 Advanced Hydrology
- SEAA 5623 Urban Stormwater Management

5. Geotechnics

- SEAA 5713 Advanced Soil Mechanics
- SEAA 5723 Geotechnical Analysis & Design
- SEAA 5733 Slope Engineering

6. Transportation

- SEAA 5813 Highway and Infrastructure Design
- SEAA 5823 Advanced Road Material
- SEAA 5833 Traffic Management & Analysis

7. Environmental

- SEAA 5913 Environmental Management & Sustainability
- SEAA 5923 Land use and Environmental Planning
- SEAA 5933 Air and Noise Pollution

6.4 Course Synopsis Core Courses

6.4.1 First Year

SEAA 1011 - Introduction to Civil Engineering

This course is only offered in the 1st Semester to all new students of Faculty of Civil Engineering. The course includes a general introduction to the field of civil engineering and the engineer's responsibilities to society. Main subfields in the discipline such as Structural Engineering, Transportation and Geotechnical Engineering, Hydraulics and Hydrology and Environmental Engineering will be highlighted by experts of the respective subfields. The course also exposes the students to generic skills related to engineering practices such as team working, making ethical decisions and communication skills through lectures and group projects. Prior to the weekly lectures and presentations, a special welcoming lecture will be given by the Dean of Faculty.

SEAA 1023 - Engineering Surveying

This course provides the basic theory and practice of surveying to civil engineering students. Methods of establishing horizontal & vertical control for construction and design are explained, compared, and practiced via fieldwork. Since accuracy of survey work is vital in ensuring designs are exactly positioned, students must be able to analyze errors so that standard accuracies are met. Detailing for producing site plans, area and volume estimations, road curves geometric design is also discussed. The concept of field survey automation and the usage of software are explained. At the end of the course, students are expected to be able to plan, execute, compute, and analyze surveying works involved in establishing horizontal & vertical controls and producing plans for civil engineering applications. Students should also be able to geometrically design horizontal and vertical curves according to standards, perform area calculations and volume estimation for earthwork activities in civil engineering.

SEAA 1031 - Surveying Camp

Pre-requisite: SEAA 1023 Engineering Surveying

After successfully completing course SKAA 1023, students are well exposed to the theory and practice of surveying. Nevertheless, surveying projects that were undertaken so far are 'stand- alone' projects with emphasis on the understanding of the concepts involved. Therefore, this subject provides training for the surveying work involved in a typical civil engineering project. In other words, this subject gives a holistic view of the surveying activities needed prior to and during the construction stage of a civil engineering project. The course will furthermore train students in planning and executing survey work on a larger scale. The surveying works involved depend on the type of project undertaken, but normally include establishing horizontal and vertical controls, detailing, earthwork calculations and setting out. Students are assessed based on their oral presentation and written reports submitted at the end of the course. This subject introduces the basics and concepts of surveying in general with emphasis on engineering surveying. Basic surveying needs commonly required in civil engineering are explained. Methods of establishing horizontal & vertical controls, detailing for producing site plans, area and volume estimations, road curves geometric design and setting out are

discussed. Students are introduced to the typical field tasks as required in civil engineering. Common methods of field procedures, bookings and reduction of observations are adopted. Students are expected to be able to establish horizontal and vertical controls, setting out and detailing. The importance of surveying field activities prior to the design and during the construction stages in civil engineering work is highlighted. Since accuracy of survey work is vital in ensuring designs are exactly positioned, students must be able to conduct survey works that meet standard accuracies.

SEAA 1213 - Engineering Mechanics

The course is designed to expose the students to the basic principles of statics and dynamics. The subject is divided into two parts: Mechanics of Statics and Mechanics of Dynamics. The content of the lecture will be emphasized on the application of the basic mechanics principle in civil engineering. Mechanics of Statics deals with equilibrium of bodies, i.e., bodies at rest and bodies moving with a constant velocity. It includes resultant and resolution of forces, equilibrium of a particle, force system resultant, equilibrium of rigid bodies, center of gravity and centroid, and moment of inertia of an area. Mechanics of Dynamics deals with the accelerated motion of bodies. It includes kinematics and kinetics of a particle and of a rigid body. Kinematics discusses the relationship between displacement, velocity, and acceleration against time. Kinetics covers the concepts of force and acceleration (Newton's second law of motion), energy and work, impulse and momentum, and vibration. At the end of the course, students should be able to incorporate and utilize principles of applied mechanics in civil and structural engineering problems.

SEAA 1213 - Engineering Mechanics

The course is designed to expose the students to the basic principles of statics and dynamics. The subject is divided into two parts: Mechanics of Statics and Mechanics of Dynamics. The content of the lecture will be emphasized on the application of the basic mechanics principle in civil engineering. Mechanics of Statics deals with equilibrium of bodies, i.e., bodies at rest and bodies moving with a constant velocity. It includes resultant and resolution of forces, equilibrium of a particle, force system resultant, equilibrium of rigid bodies, center of gravity and centroid, and moment of inertia of an area. Mechanics of Dynamics deals with the accelerated motion of bodies. It includes kinematics and kinetics of a particle and of a rigid body. Kinematics discusses the relationship between displacement, velocity, and acceleration against time. Kinetics covers the concepts of force and acceleration (Newton's second law of motion), energy and work, impulse and momentum, and vibration. At the end of the course, students should be able to incorporate and utilize principles of applied mechanics in civil and structural engineering problems.

SEAA 1422 - Engineering Drawing

This course is designed to expose the students to the basic understanding of technical and engineering drawings. It will cover the aspect of understanding and interpretation of the element of drawings. The concept of orthographic and isometric projection will be discussed and applied in the hands-on session with Computer Aided Drawing (CAD). Students will also be exposed to the civil works drawings, i.e., the earthworks, reinforced concrete detailing and structural steel detailing drawings. Several exercises are performed with the use of CAD to get the students acquaintance of the software. During this session, students will be asked to

draw and submit group projects that are given to them. After completing this course students should be able to produce civil engineering drawings using CAD

SEAA 1513 - Fluid Mechanics

This course is designed to introduce and apply the concepts of Fluid Mechanics (fluid statics and kinematics, forces and flow in closed conduits, pipe networks and centrifugal pumps) and to solve problems related to Civil Engineering. It encompasses topics such as fluid statics and fluid dynamics. The pressures and forces in these static and dynamic fluids are introduced, discussed, and analyzed through equations. It also covers upon the analyses of flows in closed conduits to include minor and major head losses. The performance characteristics, functions, and applications of centrifugal pumps in pipeline systems are also demonstrated and analyzed in this course.

SEAA 1713 - Soil Mechanics

This subject is a compulsory subject for civil engineering students. The content of this subject will give a student basic understanding and exposure towards practical in Geotechnical Engineering. It will cover basic soil properties which consists of soil composition, soil classification and soil compaction. Besides that, it will also discuss vertical stresses in soil due to overburden and external loading, water in soil and soil shear strength. The topic that will be covered is important to civil engineers where most of the problems occur at site will involve geotechnical and soil mechanics. At the end of this subject, students will be able to apply the knowledge on basic soil properties, soil classification and compaction properties, water in soil and shear strength parameters in the planning, analysis, design, and supervision of related geotechnical works.

6.4.2 Second Year

SEAA 2012 - Civil Engineering Laboratory 1

Civil engineering is a practical field and laboratory work is essential to be performed by students in this field. The laboratory work, which consists of workshops and experiments, is designed to expose students' essential problem solving and experimental techniques. Most of the generic attributes that the students must develop at the University are acquired through laboratory experiments and research. Laboratory sessions can strengthen the students to relate the fundamental theories with laboratory experiments in the field of concrete, transportation, hydraulics, and structural engineering. Each student will experience data collection and perform data analysis and result interpretations. Application of the experimental results to the real civil engineering problem will be highlighted. Upon completion of the course, students are expected to be able to perform laboratory experimental work and investigation in concrete, transportation, hydraulics, and structural engineering, to develop the techniques of conducting measurements, data analysis and interpret results in written report, and to develop generic attributes and enhance their ability to participate effectively in a laboratory environment and be able to work as part of a team.

SEAA 2032 - Mechanical and Electrical Systems

This course is a service course from the Faculty of Mechanical Engineering & the Faculty of Electrical Engineering. The course will expose civil engineering students to the fundamentals of Mechanical & Electrical building services. The topics to be covered in the Mechanical Portions are design of Domestic Water Supply System, Fire Prevention System, Ventilation and Air-Conditioning System and Lift and Escalators System. Students will be exposed more to design using professional charts and codes and catalogues from manufacturers. The electrical portion of the course covers single phase and three phase system followed by an insight to transformer and induction motor operation. The electrical section will also cover the commercial practice of electrical wiring and substation design. At the end of the course, students should be able to demonstrate an understanding of electrical systems and machines' operation and the ability to design domestic wiring systems.

SEAA 2112 - Civil Engineering Materials

This course is designed for students to understand the different types of construction materials used in civil engineering. It will emphasize on types, properties, and function of cement, aggregates, water, admixtures in concrete; properties of fresh and hardened concrete, concrete mix design method, manufacturing concrete on site; test of hardened concrete; timber - properties, characteristics, manufacturing, and applications, masonry - types and characteristics of brick and block, mortar in masonry work, ferrous and non-ferrous metal, and other latest materials in construction industry. At the end of the course students should be able to describe, identify and discuss the properties and behavior of different types of civil engineering materials together with the selection of the right materials for applications in practice.

SEAA 2223 - Mechanics of Materials and Structures

Pre-requisite: SEAA 1213 Engineering Mechanics

This is a core subject. Students will be able to understand the basic theory of the fundamental principles of mechanics of materials. Students will be able to incorporate these fundamentals into the application of the basic design of simple structures. It will assure them of the concepts of stress and strain, plane-stress transformation, shear force and bending moment, stresses in beams, and deflections of beams, vibration of beams, columns, and torsion. At the end of the course, the students should be able to solve numerous problems that depict realistic situations encountered in engineering practice. The students will also be able to develop and master the skills of reducing any such problem from its physical description to a model or symbolic representation to which the principles may be applied.

SEAA 2413 - Computer Programming

This course is designed to expose the students to the development of programming skills using a computer language which is suitable for the current computer operating system. It will emphasize the general concept of computer programming that includes steps of problem-solving using computer, algorithm and program logic tools, interface design, modularization, arrays, files, and graphics. Examples, assignments and group projects related to various civil engineering fields are given to the students. At the end of the course, the student should be able to plan, analyze, and write computer programs for basic civil engineering applications.

SEAA 2513 - Hydraulics

Hydraulics is one of the major disciplines of civil engineering. This course introduces the concepts of open channel fluid flow and their applications in hydraulics engineering problems. It covers various aspects of open channel hydraulics including types of open channel flow, design of channel section dimensions, uniform, and non-uniform steady flows. Dimensional analysis and the principle of hydraulic similitude in physical modelling are also included. At the end of the course, students should be able to apply the knowledge in solving civil engineering hydraulics problems.

SEAA 2712 - Engineering Geology and Rock Mechanics**Pre-requisite: SEAA 1713 Soils Mechanics**

This course is designed to enable students to evaluate, to apply and to analyze the relevant geological and rock mechanics principles in designing safe and economical rock engineering structures. In geology, the related topics on rock types/classifications, geological structures and geological processes are taught. Having acquired this knowledge, the principles of rock mechanics are then introduced mainly to highlight the relevancy of engineering properties of geological materials in designing rock engineering projects. These principles include engineering properties of rock material, rock discontinuities and rock stabilization systems. At the end of the course, students should acquire the related knowledge and principles in geology and rock mechanics and should be able to apply these knowledge and principles in designing safe and economic engineering structures in rock masses.

SEAA 2722 - Geotechnics I**Pre-requisite: SEAA 1713 Soil Mechanics**

This course is one of the core courses, which provides solid background knowledge on the properties and behavior of soils for geotechnical engineering practice. Understanding of the course will help the students in designing civil and geotechnical engineering structures. Topics for the course are stresses in soils, compressibility and consolidation of soils, and slope stability. At the end of the course, students should be able to analyze and apply the related theories of soil behavior, and to solve problems of stresses on retaining structures, consolidation settlement and slope stability.

SEAA 2832 - Highway Engineering**Pre-requisite: SEAA 1713 Soil Mechanics**

This is one of the compulsory courses which will expose students to the fundamental theory of highway engineering. Topics covered are highway materials and evaluations, premix plants, construction techniques and plants, mix designs, quality controls and testing, pavement structural thickness design, highway drainage, pavement visual assessment, maintenance, and rehabilitation.

SEAA 2912 - Water Treatment

This course is designed to expose the students to water treatment technology. Topics discussed include basic water quality requirement, water characteristics, water treatment process and supply, and design of unit water treatment systems. For design of water treatment system, it will cover the design of unit treatment operation. Other than treatment methods, the course also discuss on the water distribution.

SEAA 2922 - Wastewater Engineering

The course is designed to expose the students to wastewater treatment technology. The course will emphasize basic environmental microbiology, characteristics of wastewater, wastewater analysis, design of conventional wastewater treatment systems and sludge treatment. For the design of wastewater treatment systems, it will cover the design of clarifier, waste stabilization pond, conventional activated sludge, extended aeration, sequential batch reactor, aerated lagoon, and trickling filters. The course also covers the sewage quality standards under the Environmental Quality Act 1974. The course exposes students to select suitable wastewater treatment systems for certain applications. At the end of the course, the students should be able to apply the knowledge to design a simple unit operation of wastewater treatment systems and to modify existing unit operation.

6.4.3 Third Year

SEAA 3012 - Civil Engineering Laboratory 2

Civil engineering is a practical field, and laboratory work is essential to be performed by students in this field. The laboratory work, which consists of workshops and experiments, is designed to expose students' essential problem solving and experimental techniques. Most of the generic attributes that the students must develop at the University are acquired through laboratory experiments and research. Laboratory sessions can strengthen the students to relate the fundamental theories with laboratory experiments in the field of concrete, transportation, hydraulics, and structural engineering. Each student will experience data collection and perform data analysis and result interpretations. Application of the experimental results to the real civil engineering problem will be highlighted. Upon completion of the course, students are expected to be able to perform laboratory experimental work related to civil engineering such as; concrete, transportation, hydraulics, environmental, geotechnical and structural engineering, to develop the techniques of conducting measurements, data analysis and interpret results in written report, and to develop generic attributes and enhance their ability to participate effectively in a laboratory environment and be able to work as part of a team.

SEAA 3022 - Integrated Design Project 1

Pre-requisite: All SEAA 1### and SEAA 2### courses

Integrated Design Project 1 is tailored to encourage students to explore the inception and conceptual planning stage of a civil engineering development project. The subject focuses on site and utility planning of a development project given to students working in groups. Such exercise may include developing a survey plan. For the specific proposed site, developing a general drainage and sewerage plan including evaluation of and connection to existing infrastructure and possible need for sewage lift station, proposing location and type of soil investigation to be carried out, producing preliminary road and utility cross sections and recommending any improvements to ease traffic congestion, developing an environmental mitigation plan including sittings of detention ponds and wetlands, to consider alternatives for sustainable design, evaluate the impact of relocating existing utility services and producing a preliminary project design schedule showing milestones and critical path.

The scope and brief of the proposed development will be reflective of a real-life development project. Students are required to integrate their knowledge of civil engineering disciplines such as (but not limited to) geotechnical engineering, highway and transportation, wastewater engineering, and sustainable development considerations into their overall project work. At the end of this course, the students will be able to comprehend the importance of proposing a viable and workable development project and appreciate the importance of integration and synthesis of various disciplines of civil engineering knowledge.

SEAA 3045 - Industrial Training

Pre-requisite: All Basic Civil Engineering Core Courses

Industrial Training is a core course which will assign students to work with industries for a period of 12 weeks. The training aims to expose students to real civil engineering practices such as project planning and design, construction management and site supervision and other fields of specialization. Students will gain knowledge and working experience as well as improving their interpersonal skills through working with professionals from industries. Depending on the nature of work, the students will have the opportunity to apply theories learnt in the lecture room into real civil engineering practices.

SEAA 3123 - Construction Technology, Estimating & Contract

This is a compulsory course. This course emphasizes the principles of construction in building and civil engineering works, which consists of site preparation and layout, earthwork activities, construction of various building elements such as foundations, floors, walls, and roofs. It also covers other important aspects in construction i.e formworks and scaffoldings. General concepts on industrialized building systems including precast, prestressed, and modular coordination in construction are also introduced. The syllabus also covers the introduction to the methods of estimating and the preparation of the Bills of Quantities and project estimating. At the end of the course, the students should be able to describe and distinguish the various building elements, techniques and systems used in construction and to be able to estimate the cost of the building elements. The students should also be able to demonstrate the capability of working in a team and some acquirement of contemporary knowledge.

SEAA 3243 - Theory of Structures

Pre-requisite: SEAA 2223 Mechanics of Materials

This course introduces students to the analysis of determinate and indeterminate structures in civil engineering. The course emphasizes the analysis of beams and frame structures subjected to various load conditions by using classical techniques. The course is limited to the linear elastic analysis of beam and frame structures except in plastic analysis where the critical loads at failure are being examined. Students will also be taught on the use of influence diagrams to solve problems involving determinate beams subjected to moving loads. At the end of the course, students should be able to apply the knowledge and use the classical techniques for solving problems in structural engineering

SEAA 3313 - Reinforced Concrete Design I

Pre-requisite: SEAA 2223 Mechanics of Materials

This is a core course which will provide an understanding and ability to analyze, and design reinforced concrete structural elements. Among the topics discussed are reinforced concrete as a sustainable construction materials, objective and methods of design, code of practice, analysis, and design of sections for moments and shear, checking for deflection and cracking, durability and detailing requirements, design of simply supported and continuous beams, design of one way and two ways restrained and simply supported slab. Furthermore, the students will be exposed to the concept of prestressed concrete which covers topics on principle and methods of prestressing, stress limit, losses, and selection of section.

SEAA 3323 - Structural Steel & Timber Design

This is a core subject. Students will be able to incorporate and utilize technology in the analysis and design of steel and timber structures. It will expose the students to the analysis and design of steel and timber structural elements. For the steel design, the topics covered include the advantages and the general concepts of steel constructions, analysis and design of restrained and unrestrained beams, columns with axial load, columns with axial load and bending moment, trusses, bolt, and weld connections. For timber structures, the topics covered include the design of beams and columns.

SEAA 3412 - Building Information Modelling and Data Management

Pre-requisite: SEAA 1422 Engineering Drawing

This course is designed to introduce the concept and principles of Building Information Modelling (BIM), the utilization of BIM technology in the architecture, engineering, and construction (AEC) industry, and future trends of BIM developments. BIM is not only a technology that is dramatically changing the way AEC projects are delivered today, but also involves more integrated processes and parties (considering clients, designers and planners, owners, and other stakeholders throughout the project life cycle). This course is also designed to expose the students to analyzing, designing, and developing huge amounts of data. It concerns the management of information and how to model it in a structured manner. The use of the database system as an application tool gives the student a further step to apply an IT application in solving their problems. This course also exposes the knowledge on the usage, management and sharing of data and information to ensure that information is manipulated and used effectively. The aim of the course is to give students a practical, hands-on introduction to BIM and data management techniques for the documentation and modelling of designed structures. At the end of the course, students should be able to plan, analyze, and model the data to develop the BIM model and data management related to civil engineering problems.

SEAA 3613 - Hydrology and Water Recourses

Pre-requisite: SEAA 1513 Fluid Mechanics

The course emphasizes hydrology and its application in the field of engineering, especially those related to water resources. Interdisciplinary aspects of hydrology that will be introduced and discussed are the understanding of the hydrological processes. These processes are precipitation, evaporation, transpiration, surface runoff, groundwater flow, infiltration, and interception. Some processes will be discussed in more detail as compared to the others. An introduction to flood estimation will be highlighted together with the basic analysis and concept

design in accordance with local guideline of Urban Storm water Management Manual for Malaysia (MASMA). Frequency analysis will be discussed in this subject. A brief introduction to the hydrologic modeling processes will be introduced as a basic requirement to the understanding of the empirical and numerical modeling concepts. Upon completion of the course, students are expected to be able to describe and assess all the physical processes found in the hydrologic cycle together with the basic quantitative hydrologic analysis methods.

SEAA 3712 - Geotechnics 2

Pre-requisite: SEAA 2722 Geotechnics 1

This course will provide students with sound knowledge of onsite investigation and foundation designs for civil and geotechnical engineering structures. The main topics of the course are site investigations, shallow foundations, and pile foundations. The importance of site investigation for safe and economic foundation designs will be emphasized. Methods, procedures, and planning of effective site investigation will be addressed. The topic of shallow foundation will be based on Terzaghi's theory and Meyerhof's general bearing capacity equation, which will include the effects of ground water and eccentric load. Static formulae (Meyerhof' method, α and β methods) and dynamics formula will be introduced to determine single pile capacity in different soil conditions. Capacity and efficiency of pile groups in different soils will be addressed.

SEAA 3842 - Traffic Engineering

This is one of the compulsory courses which will expose students to the fundamental theory of traffic engineering. The main content of the course provides students with the fundamental theory of traffic flow and management. Major topics include drivers' behavior and interactions, fundamental theory of speed-flow-density relationships and applications in road performance analysis, traffic studies, design of traffic signal control system, and highway geometric design.

SEAA 3913 - Environmental Management

The course is designed to expose the students to various aspects of environmental pollution and concepts of environmental management. The course will emphasize discussion on different aspects of environmental components including water, air, soil, and waste management. The importance and impacts on the type of energy usage towards the environment will also be covered in this course. Various pollution control and prevention methods, environmental regulations as well as the implementation and concept in the environmental impact assessment (EIA) in achieving sustainable development will also be among the important aspects of this course. Upon completion, students should be able to demonstrate and apply the knowledge by the ability to identify specific pollution control technology and methods and the processes in preparing an environmental impact assessment (EIA) report. The students should be able to synthesize the knowledge in a group project and demonstrate a cooperative effort while working in a team as well as develop good relationship and interaction with colleagues and work effectively with other people to achieve mutual objective.

6.4.4 Fourth Year

SEAA 4013 - Advanced Engineering Surveying

**Pre-requisite: SEAA1023 Engineering Surveying
SKAB1031 Survey Camp**

This course provides the theory and practice of advanced surveying to civil engineering students. Methods of surveying measurement using modern and advanced technology civil engineering designs and projects are discussed the applications of precise levelling, 3D terrestrial laser scanning (TLS), global positioning system (GPS), photogrammetry and hydrographic surveying in typical civil engineering projects are highlighted. Deformation surveys, which are often required in dilapidation surveys, is also discussed. The theory of error propagations and their adjustments are also discussed. Relevant fieldworks are conducted to enhance students' grasp of the theory. At the end of the course, students are expected to apply advanced measurement techniques in solving positioning and dimensioning problems in civil engineering.

SEAA 4021 - Civil Engineering Seminar

This course is designed as a compulsory attending course, which is carried out based on a seminar format. Speakers from universities and from within the practicing civil engineering- based organizations will be invited to talk on specialized topics and issues in various civil engineering fields including safety and health. At the end of the course, students should be able to understand the actual civil engineer practices in civil engineering-based activities and adhere to professional ethics.

SEAA 4022 - Research Methodology and Pre-Project

This course is a compulsory course for all students before they undergo the Final Year Project. In this course, the student will be exposed to various aspects of research including types of research, method of literature review, research design, results, and analysis, writing of thesis and journal and presentation skills. The students will also be exposed to the problem-solving methodology, decision-making and data collection process. This helps to prepare the students for the Final Year Project. The student must prepare a Pre-Project proposal report on the topic that will be given by their supervisors. At the end of this course, students should be able to understand all aspects of research, conduct research in a systematic way, solve and analyze data and results and write and present pre-project proposal reports.

SEAA 4032 - Integrated Design Project 2

Pre-requisite: SEAA 3022 Integrated Design Project 1

Integrated Design Project 2 (IDP 2) is tailored to expose and familiarize students to a feasibility study and preliminary design of a civil engineering development project that has been developed previously in Integrated Design Project 1 (IDP 1) (conceptual planning stage). The aim of the Feasibility Study phase is to determine the optimum scheme from a technical, economic, environmental, and construction view. A Feasibility Study Report is the minimum expected output of this phase. The Feasibility Report shall encompass all the engineering attributes developed in the Planning Stage (IDP 1) and shall propose several options. Each option shall then be investigated to measure its capability to sufficiently address the project constraint aspects and the optimum scheme determined. The chosen scheme will then be developed to the stage of producing a Detailed Design Brief to be adopted at the final Integrated Design Project phase (SKAA 4042). Such exercise shall in part maintain the continuity of the IDP project series. At the end of this course, the students will be able to comprehend the importance of reviewing and selecting a feasible technical proposal and appreciate the importance of integration and synthesis of various disciplines of civil engineering knowledge.

SEAA 4034 - Final Year Project

Pre-requisite: SEAA 4022 Research Methodology and Pre-Project

This course is compulsory for all students before they can get their bachelor's degree. In this course, the student is expected to be able to conduct research activity independently with supervision from their supervisor. The students are also required to write a good thesis report and be able to present their project findings effectively. At the end of the course, students should be able to conduct research in a systematic way, collect data relating to the project, solve and analyze data to obtain results, write a good project report and present project findings.

SEAA 4113 - Construction and Project Management

This course aims to develop an understanding of the importance of construction management principles and its related tools. The course starts with understanding the general perspective of management issues and processes and their relationship to construction. The construction project life cycle together with the roles and responsibilities of professionals involved at each stage will be discussed. The Knowledge, Skills, Roles, and Ethical responsibilities of a project manager will be explained. The second part of the course will include the usage of tools available in construction management particularly in the application of planning and scheduling technique using Gantt chart and networking technique. The course will also expose the students to the application of popular scheduling software. The third part of the course is dedicated to the application of scheduling techniques related to resource management, resource allocation and project time cost trade-off. The last important topic involves analyzing the project cash flow requirements, project monitoring and control. New Academia Learning Innovation (NALI) such as case study teaching will also be implemented.

SEAA 4223 - Structural Analysis

Pre-requisite: SEAA 3243 Theory of Structures

This course is designed to expose the students to analyzing two-dimensional structures using a matrix operational method and computer applications. The matrix operational method is also suitable to be programmed in computers as the solutions adopt the matrix concept. The course consists of the flexibility method, the stiffness method, concept for solving matrices, an introduction to finite element method and structural modelling using existing software. The structures include beams, trusses, and frames. At the end of the course, students should be able to analyze the structures by using the numerical methods and/or the existing computer software. The students should also have problem-solving skill on problems of interest in Civil Engineering structures.

SEAA 4333 - Reinforced Concrete Design 2

Pre-requisite: SEAA 3313 Reinforced Concrete Design 1

This course is a core course which will expose students to a wider scope of reinforced concrete design. As a continuation to the Reinforced Concrete Design 1, the topics to be covered are design of staircase, design of column, design of footing and pile cap and design of retaining walls. Furthermore, the students will be exposed to the method of analysis of reinforced concrete frames.

6.5 Synopsis of Faculty's Elective Courses

SEAA 4143 - Construction Plants and Equipment

This course introduces the techniques of applying engineering fundamentals and analyses to the planning, selection, and utilization of construction equipment. In general, the right selection, efficient utilization, and cost-effectiveness of major construction operations have significant impacts on the overall cost and duration of construction activities. This course uses concepts from various engineering disciplines such as Engineering Economics, Geotechnical, Mechanical, Structural and Environmental Engineering, among others. At the end of this course, the students should be able to apply engineering fundamentals and analyses to the planning, selection, and utilization of construction equipment. This includes a thorough understanding of the total construction process and how construction equipment should be selected and used to produce the intended quality in the most cost-effective manner.

SEAA 4153 - Offshore Structures

Pre-requisite: SEAA 3243 Theory of Structures

SEAA 3352 Reinforced Concrete Design 1

SEAA 3323 Structural Steel & Timber Design

This course emphasizes on the overview of offshore structural engineering related to oil and gas industry by covering vast amount of fundamental topics such as Front-end engineering design (FEED), Environmental loads, Response of Structures to environmental loading, Analysis and Design of Offshore Steel platforms, Analysis and Design of Offshore Topside Modules, Construction of Steel Platforms, Load-out, installation, hook-up and commissioning of offshore structures, Inspection, repair and Maintenance, Structural assessment of existing structures as well as removal of disused structures.

SEAA 4163 - Concrete Technology

This course is designed to introduce students and enhance their knowledge of concrete technology. It will emphasize on the rheology of fresh concrete, the various design of concrete mixes, the different types and properties of cement replacement materials, special concretes which include fiber reinforced concrete, high strength concrete, lightweight aggregate concrete, and polymer concrete. Other topics that will be covered include concrete deformations, durability of concrete, and repair of concrete structures due to various causes of deterioration. At the end of the course students should be able to identify, discuss and apply the materials and technology available in producing good concrete that is suitable for different applications.

SEAA 4203 - Stability and Dynamics of Structures

Pre-requisite: SEAA 3243 Theory of Structures SEAA

4223 Structural Analysis

This is an elective course that is offered to final year undergraduate students. The structural dynamics covers introduction, natural frequency, single degree of freedom, multi-degree of freedom system, Eigenvalues and Eigenvectors, free vibration response. Structural instability covers concept, simple model, Euler column instability, stability functions, Bolton Method, and Horne Method. At the end of the course the students should be able to solve numerous problems which involve dynamics and instability. The students will also be able to develop and master the skills of reducing any problems from its physical description to a model or symbolic representative to which the principles may be applied.

SEAA 4243 - Finite Element Method

Pre-requisite: SEAA 4223 Structural Analysis

This course is developed to expose students to the fundamental theory and application of the finite element method. The course covers linear analyses for displacements and stresses in continuum structures. Formulation of stiffness matrices for one-dimensional elements, beams, plane stress and plane strain are presented in detail. Grillage, plate bending, shell, Axisymmetric and solid elements are also discussed. Isoperimetric formulation is emphasized. Use of finite element software for modeling and analysis is also emphasized. At the end of the course, students should be able to apply the finite element method by hand calculation for simple problems. For more complicated problems, the students should be able to create finite element models, choose correct elements, analyze, and interpret results using Finite Element software. Students also should be able to analyze practical problems by implementation through final project and make class presentations to demonstrate their understanding about the course materials.

SEAA 4263 - Earthquake and Wind Engineering

This is an optional course. In the early stage, introduction to structural design and dynamic effect from wind and earthquake is revealed. Steps and method of structural design for wind load will be discussed. Then, engineering aspects in seismology will be discussed. Other than that, seismic reaction on structure, general consideration on earthquake resistant design and seismic behavior of structural system will be taught. Students will also be introduced to the permanent earthquake resistant design and structural earthquake resistant design. Lastly, some issues on special topics in Earthquake Engineering will be discussed.

SEAA 4273 - Maintenance of Seismic Structures and Materials

This is an optional subject. This subject gives an introduction on seismic maintenance and concepts related to it. Dynamic analysis with computers will also be introduced. Topics related including non-linear seismic analysis, structure and earth interaction, base separation, and energy dissipation device.

SEAA 4323 - Prestressed Concrete Design**Pre-requisite: SEAA 3352 Reinforced Concrete Design I**

This is an elective course, which will provide students with an understanding and ability to analyze, and design prestressed concrete structural elements. Topics discussed include the concept and principles of prestressing, methods of prestressing concrete, stress limits, losses of prestress, and selection of section, serviceability, and strength requirements. Students will also be exposed to the complete analysis and design procedure of simply supported prestressed concrete non-composite and composite beams, and design principles of continuous beams.

SEAA 4383 - Analysis and Design of Tall Building Systems

The subject emphasized the analysis and design of tall buildings' structural systems. It covers fundamentals to tall building structures and related issues in analysis and design from around the world. The students will be guided through the Code of Practice basic requirement of analysis and design of tall buildings. The ultimate behavior, analysis, and design of tall building structural elements such as from basic element of reinforced concrete plates, formation of frames structures, composition of shear walls and core wall of structures will be checked and explain before the students are guided through the real analysis and design of various shapes of buildings. Finally, detailing of shear walls and core walls will be explained together with the behavior of infills of frame structures.

SEAA 4433 - Advanced Computer Programming**Pre-requisite: SKAA 3413 Computer Programming**

This course is designed to expose the students to designing and developing computer programs using suitable programming languages such as visual basic and active server pages. It will emphasize the general concepts of computer programming, steps of problem-solving using computer programs, advanced interface design, graphics, multimedia, animation, database design and web programming. The course will also provide hands- on sessions for the students to solve tutorials and problems given that related to civil engineering fields. At the end of the course, students should be able to understand the steps in problem solving and apply the knowledge to identify and analyze civil engineering problems that require computer programming solutions. The students should also be able to design and write computer programs to solve problems.

SEAA 4463 - Construction Integration Environment**Pre-requisite: SKAA 3412 Building Information Modelling and Data Management**

This subject concerns the Integrated Construction Environment (ICE) which involves coordinating the integration process between various construction applications. Such an environment will provide a platform whereby the Architectural, Engineering and Construction (AEC) can share and exchange information. The progress of information technology (IT) in the construction industry relies on the ability of the project participants to exchange and share information among themselves and manage Information System (MIS). The student is expected to gain some knowledge of Computer Integrated Construction (CIC), which is an emerging technology to automate the flow and exchange of construction project information. They will be exposed to Information Modeling, E-Construction, Internet, Networking, Artificial Intelligent and Groupware. The use of database management system (DBMS) and Standardization to manipulate the information will give the student a further step to apply an IT application in solving their construction problems. In the new development on the

current research and development (R&D), the applications of IT in the construction are becoming more important, especially in the new era of globalization. Therefore, the new generation of civil engineers should be equipped with this knowledge to stay competitive in the industry equipped with this knowledge to stay competitive in the industry.

SEAA 4473 - Geographic Information System

This course is an elective course specially designed for civil engineering students who always must manipulate huge amounts of spatial data. It concerns the management of information (spatially and attribute) and how to model it in a structured manner. This course will emphasize the overview and the application of GIS in civil engineering, GIS data structure, data manipulation and GIS implementation, information presentation of GIS, and a review of GIS software and sample of application. The development of a prototype system has also been highlighted in this course to give the student a proper technique for developing an application. At the end of the course, students will be able to plan, analyze, and model the information for developing GIS applications related to civil engineering problems.

SEAA 4523 - Coastal Engineering

Pre-requisite: SEAA 2513 Hydraulics

The course covers theoretical and fundamental principles of coastal hydrodynamics and processes. It gives background knowledge of the various hydrodynamic parameters acting in the coastal region due to waves, tides, and currents. Sediment transport mechanism in the littoral zone leading to the understanding of coastal morphology, erosion and accretion processes are described. Underlying principles of coastal engineering works, coastal erosion management and implications from implementing coastal structures in the coastal environment are delivered. Emphasis in solving and tackling coastal engineering problems adopts the use of established analytical techniques. The application of state-of-the-art computational techniques as a tool in several aspects of coastal engineering and management works are introduced. At the end of the course, students should be able to describe and analyze the various coastal processes and the effect of these forces on the coastal zone. The students should be able to quantify coastal environmental parameters. They should also be capable of proposing methods to control the processes using analytical techniques and evaluate results yielded by computational techniques when applied to solve coastal engineering problems.

SEAA 4613 - Water Resources Management

Pre-requisite: SEAA 1513 Fluid Mechanics

SEAA 3613 Hydrology and Water Resources

This is an elective course aimed to equip students with in-depth knowledge in water resources, design, and management. This course highlights major water resources management issues with the emphasis on the integration of various management components. While the course contents maintain the technical elements of water resources system and engineering, students are also exposed to the realities of the political, economic, and social settings that influence the decision-making process. Upon completion of this course, the students should be able to demonstrate the diverse and complicated issues in water resource management, discuss the need and steps for integrated management approach, analyze and determine viable project options, propose appropriate management strategies, and apply the appropriate techniques and strategies in reservoir planning and design.

6.6 Synopsis of Faculty's PRISMS Elective Courses

SEAA 5113 - Construction Laws and Contract

This course introduces students to Malaysia laws, which will focus on the sources, and branches of law in Malaysia. The course will emphasize private laws related to construction practice, torts, law of contract and construction contract administration. Students will be exposed to construction contract administration which covers the Standard Forms of Contract, disputes in construction and dispute resolutions. At the end of the course, students should possess a sound knowledge of the Malaysian legal framework and familiar with legislative and legal constraints applicable to the practice of construction. More importantly, the students should be able to use their knowledge to promote an ethical and better image of the construction industry.

SEAA 5123 - Construction Site Management and Safety Control

The course is designed to educate the student on the construction site management and occupational health and safety (OHS) concept. The course is divided into two parts namely site management and safety control. The first part will emphasize site management, particularly principles of site management, site performance, site reporting, monitoring and control, site layout, workers' welfare, and site resources. The second part will focus on accident theories, prevention and investigation, risk management, OHS Management, performance and culture, occupational health such as stress and ergonomics within construction projects. Upon completion, students should be able to apply effective site management and practice the knowledge Occupational Health & Safety Management and Accident Prevention within construction projects.

SEAA 5133 - Sustainability & Environment Management in Construction

The developments of buildings and infrastructure have inherent links with the environment. Land, materials, water, energy are all consumed during the construction operation of buildings and infrastructure. The constructed facilities then become part of the new environment we must live with. The process also generates greenhouse emissions which cause damage (e.g., global warming) to our environment. This subject offers an inter-disciplinary elective designed to promote collaboration and enhance understanding of the global challenge of sustainable development that related to construction industry. The course will emphasize sustainability and environmental management within construction related issues as promoted by Agenda 21. The subject will cover aspects of embodied energy (renewable & nonrenewable), energy efficiency in building, construction waste, construction noise, water pollution, biodiversity and various sustainability control and prevention methods for construction. Thus, environmental regulations & legislation; environmental Impact Assessment (EIA) and Environmental Management System (EMS) will be incorporated into the subject. At the end of the course, students are expected to able to understand the principles of sustainable development and apply knowledge to plan, design and construct using sustainable concepts and methods.

SEAA 5143 - Fundamental of Project Management

This course focuses on project personnel building and maintaining robust project relationships by using appropriate tools to identify key stakeholders and then to manage the relationships between their unique stakeholder's community and the project. The course is designed to expose students to both the methodology and the supporting theory to provide students with a thorough understanding of both stakeholder and communication theory and practice in a project environment and how effective management of these factors will contribute to a successful project outcome.

SEAA 5153 - Project Planning & Scheduling

This course provides knowledge on contemporary practice in project planning and scheduling process in managing construction projects. Major software for project planning and scheduling will be used. Students will be taught to develop project schedule and WBS then use advanced technique to monitor and track project performance against baseline schedule. The concept and application of Earn Value Management system will be taught, and the student will be able to appraise project performance from time to time and recognize major delay and budget control.

SEAA 5163 – Project Financial Management

This course discusses the basic concepts of accounting and financial management, methods of financial statement analysis, evaluation of financial assets in terms of risk and return, and short-term and long-term capital management of an organization.

SEAA 5213 - Advanced Structural Analysis and Modelling

This is a core course in the Structural Engineering Program that exposes the students to matrix methods for advanced structural analysis and solving many structural problems. The types of structures involved are beams, trusses, and frames. Three dimensional structures are also included. This course also includes the application of matrix method for nonlinear geometric or second order elastic analysis and critical load prediction of structures. The applications of matrix methods for nonlinear material analysis of frame structures are also included in this course.

SEAA 5323 - Advanced Design of Steel Composite Structures

Pre-requisite: SEAA 3243 Theory of Structures

SEAA 3323 Design of Steel and Timber Structures

This course intends to give an extensive understanding to the students in the advanced design of steel structures which are the multi-story steel frames, composite beams, plate girder, and portal frame. Eurocodes (EN 1993 and EN 1994) will be employed as the standards for design. The design of multi-story steel frames covers mainly the design aspects of braced and unbraced frames. In the design of unbraced frames, a special method called the Wind-Moment method is introduced. For braced frames, three aspects of design namely simple, semi-continuous, and continuous construction are discussed and compared to give a better picture on the economic aspects of the design. Details of the design of the frames include the analysis and design of the frames for columns, beams, connections, bracing system, column, and beam splices. The course also covers the design of composite beams by using linear and stress block interaction methods which include the interaction of shear stud as full strength and partial strength. The design of plate girder is also included to cater for heavy load transferred to a long span or "column free" construction of multi-story steel frames and bridges. Lastly, the design of portal frame is covered with the focus on single span symmetrical frame.

SEAA 5313 - Advanced Design of Reinforced Concrete

Pre-requisite: SEAA 4333 Reinforced Concrete Design 1

This course is intended to provide extra knowledge on the aspect of the design of reinforced concrete structural elements. As a continuation to the Reinforced Concrete Design 1 and 2, the topics discussed are analysis and design of ribbed, waffle and flat slabs, water retaining structures, shear walls, corbel, and nibs. Furthermore, students will be exposed to the methods of deflection calculation, design of elements for torsion and design of raft foundations.

SEAA 5513 - Advanced Hydraulics

Pre-requisite: SEAA 1513 Fluid Mechanics

This course is designed to introduce advanced concepts of fluid mechanics in relation to viscous flows. It covers laminar flows, transition to turbulence and turbulent flows and will be taught with civil engineering applications in mind. The students should understand the topics of open channel flow, friction, and sediment transport from the fundamental point of view. In this course, unsteady flow in open channels and pipes - topics of specific interest to civil engineers – will also be covered.

SEAA 5613 - Advanced Hydrology

SEAA 3613 - Hydrology & Water Resources

The study of hydrological processes and systems includes rainfall, evapotranspiration, infiltration, soil water processes and overland flow. Aspect of rainfall-runoff processes and hydrologic routing are discussed and how these are modelled for use in flood estimation. Various rainfall-runoff models are reviewed. The surface water quality aspect was also covered.

SEAA 5623 - Urban Stormwater

Management Pre-requisite: SEAA 1513 Fluid

Mechanics SEAA 3613 Hydrology & Water

Resources

The course covers the theoretical aspects and design of urban storm water drainage systems. It is intended to introduce students to the fundamentals of storm water drainage system design. Methods of hydrologic design, rainfall design, flood estimation, rainfall-runoff relationship and flood routing will be taught. This will involve the planning, analysis, design, and management for the quantity aspect.

SEAA 5713 - Advanced Soil Mechanics

This subject is one of the elective subjects for civil engineering students, which will provide: the advanced knowledge on the application and principles of soil mechanics. It considers the following topics: soil and clay mineralogy, strength behavior of cohesionless and cohesive soils. Mohr-Coulomb failure criterion, peak stresses, effective stress ratio, residual stress, and critical state soil mechanics. Principles of laboratory measurement. Consolidation theory and pore pressure parameters. Difference between 1-D and 3-D Consolidation theory and introduction of unsaturated Critical state soil mechanics.

SEAA 5723 - Geotechnical Analysis & Design

Pre-requisite: SEAA 1713 Soil Mechanics

SEAA 2722 Rock Mechanics

This course, offered by the Department of Geotechnics and Transportation, will provide advanced knowledge on the analysis and design of geotechnical engineering structures such as the earth dam, earth retaining structures, embankment on soft soils and tunneling through soils. It includes evaluating poor ground conditions and propose alternative technique(s) for ground improvement such as the sand drain, vertical drains, geosynthetics, soil reinforcement, electro-osmosis, and others. Practical solutions to problems which often confronted during construction in difficult ground area will also be highlighted. The course explores examples of construction and post-construction data for the purposes of performance, safety, and design compatibility. Slope and embankment stability; natural and manmade slopes, earth dams and embankments on soft clay, will be lay out in this course. Earth retaining structures for deep excavation, brace cut, gravity cantilever, buttress and reinforced earth wall and cantilever and anchored sheet pile will also be included. Besides that, the analysis and design of tunneling work through soil and the earth dam on various foundation soil types will be demonstrated. Lastly, the geotechnical instrumentation for monitoring of the geotechnical

engineering structures will be explored.

SEAA 5733 - Slope Engineering

Pre-requisite: SEAA 1713 Soil Mechanics

SEAA 2722 Rock Mechanics

This course provides a comprehensive introduction to the subject of slope stability, from initial classification through assessment and analysis to remediation. It provides the student with the knowledge, strategy, and capability to inspect, understand and assess slope instability. The course covers both the theory and practice of slope engineering. This course is ideal for those involved in the design, analysis, or construction of civil engineering projects where the existence, creation or alteration of slope features may occur. This course considers the background to slope movements, simple classification systems and the fundamental soil mechanics that control stability. The key parameters are highlighted and discussed. The principles and assumptions of the more popular methods of analysis are introduced together with a pragmatic guide for assessing the competence of analysis software. Specific problems covered, include natural and cut slopes, earthworks, and fills. It also focusses on the practical approach to slope stability assessment and remediation. The investigation of failed slopes is considered. Remedial options to arrest or prevent movement are detailed together with a section on modeling. Techniques for the back analysis of slopes are covered and the application of stability calculations for suction assessment explored.

SEAA 5813 - Highway and Infrastructure Design

This course provides state of the art knowledge on highway and infrastructure design. Understanding of the subject will help the students to design highways and related infrastructure facilities. Topics for the subject are intersection design including roundabout design, intersection control system, highway surveys and location, geometric design of roads and highway facilities and broad cross section design. At the end of the course, students can analyze and apply the related theories to design highway and infrastructure facilities.

SEAA 5823 - Advanced Road Material

This is one of the core subjects that will enhance the knowledge of the students on advanced road materials. The course consists of the following topics i.e., asphalt mixture (HMA, WMA, CMA), premix plant (types and operation), modified asphalt, rubberized asphalt, nanotechnology and its impact on road construction, durability of asphalt premix, asphalt mixture specification and testing, emulsified, cutback and foamed asphalt, road maintenance, and quality control and acceptance of asphalt mixtures.

SEAA 5833 - Traffic Management & Analysis

This course discusses urban traffic and transportation management strategies. It addresses the basic traffic and transportation data collections, analysis and the fundamental theory of traffic flow, capacity assessment of transportation facilities and the transportation systems management (TSM) planning processes and strategies. TSM includes Advanced Traffic Management (ATM), Urban Traffic Control System (UTCS), Intelligent Transport and Traffic System (ITS) and Highway Information System.

SEAA 5913 - Environmental Management & Sustainability

This course is designed to expose students to various aspects in environmental management and the concept of sustainability. Topics discussed include the principles of sustainable development, understanding the environmental sensitive areas particularly the natural water bodies, catchment management, development of coastal and inland areas. Current issues related to environmental

problems, especially climate change and water supply are the main aspects to be addressed. Some methods and concepts of sustainable approaches are introduced to promote and achieve sustainable development goals. At the end of the course, the students should be able to understand the concept of environmental sustainability and present it through effective communication. The course enables the students to understand, plan and incorporate the concept of sustainability in environmental management.

SEAA 5923 - Land use and Environmental Planning

This course covers the fundamental concepts and mechanisms underlying land use and environmental planning from conceptual to its implementation. It focuses on the understanding of ecosystems, the impacts of land development activities along with the appropriate tools/techniques of environmental planning and management used to mitigate them. It provides an overview of the field, along with the fundamentals of land use planning, and presents a collaborative approach to environmental planning while explaining the principles of ecosystem management, restoration, and protection; land conservation; and the mitigation of natural hazards.

SEAA 5933 - Air and Noise Pollution

This course is designed to expose students to a comprehensive understanding of the elements involved in air and noise pollution, and the practical approaches to controlling pollution. In the air pollution part, topics discussed include elements and phenomena of air pollution, meteorology, control of air pollution and design considerations. In the noise pollution part, topics discussed include elements of noise pollution, effects, types of noise pollution, road traffic & aircraft/industrial noise. At the end of the course, students should acquire the fundamental knowledge related to the principles and control strategies of air and noise pollution.

SEAA 5173 - Laws in Forensic Engineering

This course introduces students to laws related to professional engineering practices. The course will emphasize two main liabilities: tort and statutory liabilities. The role of professional as expert witness will be introduced in the law of evidence so as the students will be familiar with the role of expert witness and the procedures involved during experts at trial. The focus will be on building a credible and believable testimony. At the end of the course, the students are expected to understand the legal setting in the practice and be able to analyze and apply critical reasoning and make informed judgement in addressing legal issues in engineering practice and to stand as credible expert witness.

SEAA 5223 - Risk Assessment

This course aims to give students a comprehensive exposure to structural safety, risk assessment and reliability engineering concept related to civil engineering system. The course contents consist of four different modules named Systems Reliability, Safety & Risk, Data Analysis & Simulation and Risk Assessment & Safety Management. Safety & Risk leads to an understanding of the principles of structural reliability theory and its application to risk and reliability engineering. Data Analysis & Simulation is designed to develop knowledge of statistical data analysis and its application in engineering and science and introduces the concepts of using simulation techniques for analysis of complex systems. It also teaches linear optimization techniques and the ability to apply them to solve simple problems. In Systems Reliability, this section gives an understanding of the qualitative and quantitative techniques that are used in the reliability, availability, and maintainability analysis of all types of engineering systems. The final part of this course, Risk Assessment & Safety Management gives student an appreciation of risk from individual and societal perspectives as well as understanding the basic principles of risk assessment and modelling and how safety management works in practice.

1. UNIVERSITY'S GENERAL COURSES

7.1 Introduction

Undergraduate students in the Bachelors Degree Program are required to register for the University's General Courses during their duration of study. The University's General Courses are categorized as follows:

- (i) Cluster 1: Malaysia Core Value
- (ii) Cluster 2: Value and Identity
- (iii) Cluster 3: Global Citizen
- (iv) Cluster 4: Entreprising Skill
- (v) Cluster 5: Communication Skill
- (vi) Cluster 6: Additional

These courses, introduced in Semester 1 Session 2022/20232 Academic Session, are compulsory to all Bachelor's Degree students of UTM. Students will have to complete these courses as one of the requirements for graduation.

7.2 CLUSTER 1: MALAYSIA CORE VALUE

Students are required to take a total of four (4) credits of courses as listed in the following table.

List of Courses and The Codes

Code	Name of Course	Credit
FOR INTERNATIONAL STUDENTS		
ULRS 1022	Philosophy and Current Issues	2
UHLM 1012	Malay Language Communication 2	2
FOR LOCAL STUDENTS		
ULRS 1022	Philosophy and Current Issues	2
ULRS 1182	Ethics & Cukture Service	2
Total no. of compulsory university credit course for international or local students		4

7.3 CLUSTER 2: VALUE & IDENTITY

Students are required to take a total of two (2) credits of courses as listed in the following table.

List of Courses and The Codes

Code	Name of Course	Credit
ULRS 1012	Value and Identity	2
Total no. of compulsory university credit course		2

7.4 CLUSTER 3: GLOBAL CITIZEN

Students are required to take a total of two (2) credits of courses as listed in the following table.

List of Courses and The Codes

Code	Name of Course	Credit
ULRF 2**2	Service Learning & community Engagement Courses	2
Total no. of compulsory university credit course		2

7.5 CLUSTER 4: ENTREPRISING SKILL

Students are required to take a total of two (2) credits of courses as listed in the following table.

List of Courses and The Codes

Code	Name of Course	Credit
ULRS1032	Entrepreneurship and Innovation	2
Total no. of compulsory university credit course		2

7.6 CLUSTER 5: COMMUNICATION SKILL

Students are required to take six (6) credits of English Language courses and another two (2) credits of Foreign Language as listed in the following table. The total compulsory credit for language skill is eight (8) credits.

Each course is taught for four (4) hours per week and the focus is on developing basic skills in reading, writing, listening, and speaking using science and technology materials.

List of Courses and The Codes

Code	Name of Course	Credit
UHLB2122	Advanced Academic English Skills	2
UHLB3132	English for Professional Purposes	2
UHLX1112	Elective of Foreign Language	2
Total no. of compulsory university credit course		6

7.7 CLUSTER 6 : ADDITIONAL

Students are required to take a total of five (5) credits of courses as listed in the following table.

List of Courses and The Codes

Code	Name of Course	Credit
UHLB1112	English Communication Skills (Students who are not eligible for UHLB 1112 Credit Exemption)	2
S***3	Free Elective Subjects from other Faculty	3
Total no. of compulsory university credit course		5

7.8 SUMMARY OF TOTAL CREDIT HOURS FOR UNIVERSITY'S GENERAL COURSES

Cluster	Name of Cluster	Credit
Cluster 1	Malaysia Core Value	4
Cluster 2	Value and Identity	2
Cluster 3	Global Citizen	2
Cluster 4	Enterprising Skill	2
Cluster 5	Communication Skill	6
Cluster 6	Additional	5
Total no. of compulsory university credit course		21

7.9 SCIENCE AND MATHEMATICS CORE COURSES (SSCE)

Students are required to complete 15 credits of Science and Mathematics courses as listed below:

Code	Name of Course	Credit
SSCE 1693	Engineering Mathematics I	3
SSCE 1793	Differential Equations	3
SSCE 1993	Engineering Mathematics II	3
SSCE 2193	Engineering Statistics	3
SSCE 2393	Numerical Methods	3
Total no. of compulsory university credit course		15

7.10 CO-CURRICULAR COURSES (UKQ)

7.10.1 Background

The co-curricular courses were first introduced as part of the University General Courses in July semester 1992/1993 Academic Session. It is compulsory for every student to take these courses as a pre-requisite for graduation.

The courses offered are managed by the General Courses and Co-curricular center. To attract the interest of students, a variety of courses are offered, and they are categorized into main modules such as Sports and Character Building, Personal and Social Development, Arts and Culture, and Special Programmes.

7.10.2 Requirements for Co-curricular Course Registration

The rules are applicable for students who are studying in the full-time programmes at the University.

- (i) The total number of credits for the Bachelor's Degree program is two (2).
- (ii) The maximum number of credit and course allowed per semester is one (1).
- (iii) Students who would like to take more than one (1) credit as listed in (ii) will need to obtain permission from the Co-curricular center and will be charged additional fees.
- (iv) The Co-curricular courses are part of the University's General Courses. If a student failed in any of the courses, he/she may:
 - (a) Repeat the course.
 - (b) Substitute the course with another one but the failed course will still appear on the student's transcript and will be used in the calculation of the CGPA.
- (v) Course Registration
 - (a) Students are encouraged to register during the pre-registration period to ensure a place during their choice.
 - (b) Students may take any course offered subject to its availability.
 - (c) Students are not allowed to change courses once they have registered.
 - (d) The Rules and Regulations of registration are subject to change as deemed necessary by the University.
- (vi) Credit Transfer (Credit Exemption)
 - (a) UTM graduates are eligible for Credit Transfer for all co-curricular courses they have taken in previous programme.
 - (b) Direct entry students from other institutions of higher learning will have to take at least one (1) credit of co-curricular courses.

- (c) Credit transfer for graduates from other institutions of higher learning will only be given if the course is accredited and recognized by the General Courses and Co-curricular center.
- (d) Any core course taken in or out of UTM will not be considered although the contents are equivalent or of a higher standard.
- (e) Application for Credit Transfer must be made during the first semester of the study. Approval from the General Courses and Co-curricular center is required.

(vii) Final Examination Week

The final examination for the co-curricular courses, if any, will be held during the last week of lecture.

7.10.3 Implementation of Co-curricular Courses

Students are required to attend all courses as scheduled inclusive of outdoor or off campus activities such as camping, study tour, and social services. Every activity is designed to transfer theoretical knowledge to practical applications.

(i) **Meeting Times**

The meeting hours for co-curricular courses is between 2.00pm–7.00 pm on every Tuesday. However, there are courses that will be conducted on Thursday mornings. The time allocated for the courses is a one-hour lecture or a two-hour practical activity.

(ii) **Marking Scheme**

The marking scheme usually followed by the trainers/lecturers is as follows:

- | | |
|--|-----|
| a) Contribution and Attendance | 20% |
| b) Assignments/practical activities | 60% |
| Types of tasks: | |
| - Portfolio | |
| - Assignment, group, or individual reports | |
| - Practical evaluation at site or lab | |
| c) Tests and Quizzes | 20% |

(iii) **Current Rules**

- a) Students are given the choice to select the activities that are of interest to them. However, the activities must be the ones offered by the General Courses and Co-curricular center for that semester. Registration for the course is subject to the availability of places.
- b) Upon registration for the course of their choice, students will not be allowed to change to another course. Students are recommended to consider their options carefully before making their decision. They are advised to refer to the timetable and the requirements of the activities before making the final decision.
- c) Students who register for the co-curricular course with less than 80% attendance without valid reasons accepted by the University, will be awarded zero (0) mark for the course. They need to repeat the course.
- d) Each student is responsible to ensure that the credit requirement for the co-curricular courses is fulfilled in accordance with the University's Regulations

7.11 SYNOPSIS OF GENERAL COURSES

Cluster 1	Malaysia Core Value
Cluster 2	Value and Identity
Cluster 3	Global Citizen
Cluster 4	Enterprising Skill
Cluster 5	Communication Skill
Cluster 6	Additional

7.11.1 CLUSTER 1: MALAYSIA CORE VALUE Compulsory Courses

UHLM1012 Bahasa Melayu Communication 2

This course aims to train students to communicate in basic Malay in everyday life. Students will be exposed to spoken and written English language easily. Students will be exposed to basic Malay spoken and written. At the end of the course, students are expected to be able to communicate and write simple sentences effectively.

ULRS 1022 Philosophy and Current Issues

This course encapsulates philosophical relation to National Education Philosophy and the Rukun Negara. The use of philosophy as a tool to purify the culture of thought in life through the arts and methods of thinking and human concepts. The main topics in philosophy, namely epistemology, metaphysics, and ethics, are discussed in the context of current issues. Emphasis is given to philosophy as a basis for intercultural dialogue and to foster universal values. At the end of the course, students should be able to view the disciplines of knowledge as a whole and interdependent body of knowledge.

ULRS 1182 Ethics & Culture Service

This course explains ethical concepts from the perspective of different civilizations. The course also aims to identify system, the level of development, advancement, and culture in strengthening social cohesion. Besides, discussion on the contemporary issues in the aspects of economy, politic, social, culture and environment from an ethical and civilization perspectives can produce students who are morally and professionally.

7.11.2 CLUSTER 2 : VALUE AND IDENTITY Compulsory Courses

ULRS1012 Value and Identity

7.11.3 CLUSTER 3 : GLOBAL CITIZEN Compulsory Courses

ULRF22 Service Learning & Community Engagement Courses**

Service-Learning or Community Engagement Courses integrate meaningful community service with instruction and reflection that can enrich the learning experience, teach civic responsibility, and strengthen communities. Service learning typically includes a structured learning experience that combines community service work with reflection that helps students develop a “community context” to their education. As a result, students who take service-learning courses can connect their academic coursework to their roles as citizens. Service-learning is often considered a high-impact practice, that is shown to benefit students at any point of their educational experience. Service-learning courses can help students learn more, at greater depth, with greater retention, and an ability to integrate and apply learning to unscripted questions and novel situations.

7.11.4 CLUSTER 4 : ENTREPRISING SKILL Compulsory Courses

ULRS 1032 Entrepreneurship and Innovation

This course is designed to expose students to the concept of entrepreneurship and entrepreneurs and the skills needed to prepare a good business plan. In addition to exposing the students to the characteristics of successful entrepreneurs, various skills to successfully run and manage entrepreneurial ventures, technique of identifying, evaluating, and choosing business opportunities, procedures to form a business, planning, funding, and business supports.

7.11.5 CLUSTER 5 : COMMUNICATION SKILL Compulsory Courses

UHLB 2122 Advanced Academic English Skills

Pre-requisite: ULAB 1122 Academic English Skills

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

UHLB 3162 English for Professional Purpose

Pre-requisite: ULAB 1122 Academic English Skills

The course focuses on the techniques of producing good spoken discourses which include public communication such as impromptu and public speeches, group discussion and negotiation. Aspects of sound and speech production will be introduced to improve intelligibility and communicability. Basic principles of oral communication and the importance of non-verbal communication will be introduced for effective communication. Students will have substantial practice in oral communication through in-class tasks and activities. These tasks and activities will enhance students’ confidence in using English for academic and

professional purpose.

7.11.6 CLUSTER 6 : ADDITIONAL

UHLB 1112 English Communication Skills

This course is designed to reinforce and enhance students' existing English Language skills to enable them to communicate better in their current surrounding (higher education setting). Through guided and independent learning activities, students will develop their skills in reading, listening, writing as well as speaking. At the end of the course, students should be able to get relevant information in texts on topics of interest. Students should also be able to write on familiar topics. Additionally, this course will provide students with opportunities to enhance their listening and speaking skills.

7.11.7 CLUSTER 5: LANGUAGE SKILL

Compulsory Courses

ULAB 1122 Academic English Skills

This course prepares students for the skills needed to perform academic tasks such as extracting information from texts taken from different sources, producing academic assignments, listening to lectures, presenting ideas orally and exchanging views. It emphasizes various skills such as reading academic texts, identifying main ideas, making, and expanding notes into coherent writing. At the end of the course, students should be able to apply the skills in an academic setting when communicating in both oral and written discourse.

7.11.8 SCIENCE AND MATHEMATICS COURSE COMPULSORY COURSES

SSCE 1693 Engineering Mathematics I

This is the first course in Engineering Mathematics. It covers topics including differentiation and integration which focus on hyperbolic and inverse functions. Improper integrals are also studied. Vectors and matrices including basic operations, solving related problems in 3 dimensions are discussed. In addition, vector spaces, eigenvalues and eigenvectors are introduced. Sketching of polar graphs is discussed. This course also covers complex numbers, function of complex variable, series, and power series.

SSCE 1793 Differential Equations

Suggested Pre-requisite: SSCE 1693 Engineering Mathematics I

This is an introductory course on differential equations. Topics include first order ordinary differential equations (ODEs), linear second order ODEs with constant coefficients up to fourth order, the Laplace transform and its inverse, Fourier series, and partial differential equation (PDEs). Students will learn how to classify and solve first order ODEs, use the techniques of undetermined coefficients, variation of parameters and the Laplace transform to solve ODEs with specified initial and boundary conditions, and use the technique of separation of variables to solve wave equation.

SSCE 1993 Engineering Mathematics II

Suggested Pre-requisite: SSCE 1693 Engineering Mathematics I

This course is about multivariable calculus of real and vector-valued functions. The basic theory of partial

derivatives and multiple integrals of real function with their application are discussed. This theory is extended to vector valued functions to describe motion in space, directional derivatives, gradient, divergence and curl, line integrals, surface integrals and volume integral. Related theorems, namely Green's Theorem, Stokes' Theorem and Gauss Divergence Theorem and their applications are discussed.

SSCE 2193 Engineering Statistics

Suggested Pre-requisite: SSCE 1793 Differential Equations

SSCE 1993 Engineering Mathematics II

This course begins with basic statistics, elementary probability theory and properties of probability distributions. Introduction to sampling distribution, point and interval estimation of parameters and hypothesis testing are also covered. Simple linear regression and one-way analysis of variance are also taught in this course. Students are taught how to use and incorporate statistical tools and software for solving engineering statistics problems through a group assignment.

SSCE 2393 Numerical Methods

This course discusses problem solving using numerical methods that involve non-linear equations, systems of linear equations, interpolation and curve fitting, numerical differentiation and numerical integration, eigenvalue problems, ordinary differential equations and partial differential equations.

8 ACADEMIC PROCEDURE

8.1 COURSE REGISTRATION GUIDELINES

- i. Students must register for all the courses taken every semester.
- ii. The course registration must be done before compulsory course registration period, which is two (2) days before the semester begins.
- iii. All students must register for the course with the correct code, section, and status (if applicable) and obtain validation from the Academic Advisor.
- iv. The University shall prepare a lecture timetable for next semester no later than the 13th weeks.
- v. Course registration is done from 14th week until 15th week of the regular semester (subject to amendment). While for the short semester registration should be done in the first week of short semester studies.
- vi. The University may impose fine on late course registration with a fee rate set by Student Financial Methods in force from time to time.
- vii. Students shall settle all outstanding debts before make course registration.
- viii. The course registration will be cancelled.
- ix. by itself if student get the result "**Gagal dan Diberhentikan [KG]**", "**Kedudukan Bersyarat [KS]**" or suspended student studies.
- x. All students must register for the course with the correct code, section, and status (if applicable) and obtain validation from the Academic Advisor.
 - a. **HS [Hadir Sahaja]** – Register for a course that is not listed in the programme curriculum for the purpose of acquiring additional knowledge.
 - b. **HW [Hadir Wajib]** – Register for a compulsory course as set in the programme curriculum.
 - c. **KM [Kursus Mobiliti]** – Register for an equivalent course offered at other IHLs under the mobility programme.
 - d. **MN [Program Minor]** – Register for a course as set under the Minor Programme offered by the University.
 - e. **UG [Ulang Gred]** – Register for a passed course in the previous semester with a grade B- and below for the purpose of improving a student's academic performance. For this purpose, he needs to get the approval from the faculty.
 - f. **Ulang Kursus [UK]** – Register for a failed course in the previous semester for the purpose of repeating the course.
- xi. Any course that needs to be repeated by a student must be registered as **Ulang Kursus [UK]** or **Ulang Gred [UG]**. This course will be classified as follows:
 - a. Ulang Mata Pelajaran [UM] or Hadir Wajib Ulang Mata Pelajaran [HWUM] for repeated course with failed grade in the previous semester.
 - b. Ulang Gred [UG] for repeated course with grade B- and below upon Faculty's approval for purpose of improving academic achievement. A non-refundable fee of RM75.00 for each credit will be imposed for this purpose.
- xii. Students with Probation Status [**Kedudukan Bersyarat [KS]**] are required to register within the specified compulsory course registration period.
- xiii. Students are fully responsible for ensuring that there is no mistake in the course registration records. Any amendment must be made within the duration of stipulated by the University.
- xiv. Late course registration or registration amendment beyond the stated period is not accepted,

- except for cases that can be considered by the University. For late registration/amendment fee of RM50.00 per course will be imposed subject to a maximum of RM300.00.
- xv. The registration of courses must be made according to the procedures set by the University. Registration that is carried out not in accordance with the procedures will not be considered or accepted.
 - xvi. If a student fails to carry out the course registration within the specified period as mentioned above, except with valid reasons accepted by the University, he/she will be dismissed from the University.

8.2 GUIDELINES FOR EXEMPTION AND TRANSFER OF CREDIT

8.2.1 EXEMPTION OF CREDIT

- i. Credit Exemption refers to the credit of a study programme that has been waived, determined during the admission process into the programme. The exemptions are given on specific courses based on the students' achievement of those courses in their previous level of study or institution. The credits exempted are based on the students' previous qualification (e.g. certificate, diploma, bachelor or experience) which is identified as equal to the Diploma or Degree from UTM. The total Credit Exemption is informed to the students during programme registration.
- ii. Students who change their programme of study, either within the University or from other IPT/ programme can apply for Credit Exemption. The Faculty accepting the student will determine the courses that will be given Credit Exemption.
- iii. Credit Exemption will not be given for programme of study which has been completed and has already been conferred a Degree from other IHLs (Institute of Higher Learning) in similar area and level.
- iv. Subject to Item 3.5 below, the maximum Credit Exemption allowed must not exceed 30% of the total credit required for degree conferral. However, the Faculty can appeal to the Senate for Credit Exemption of more than 30% subject to a maximum of 50%. Application for Credit Exemption must be submitted to the Faculty and the assessment process must be completed in week THREE (3) of the first semester of the study programme.

8.2.2 TRANSFER OF CREDIT

- i. Credit Transfer is the course's credit given to students who have passed the course taken at other recognized IHLs (Institute of Higher Learning) during their duration of study at the University. The course applied for Credit Transfer must be equivalent and fulfill the requirements of the study programme at the University.
- ii. Subject to Item 3.5 below, the total Credit Transfer allowed must not exceed 30% of the total number of credits required for the degree conferral of a programme of study.
- iii. Credit Transfer approved will be included in the calculation of GPA and CGPA.
- iv. Students are not allowed to complete their last semester in other IHLs (Institute of Higher Learning) through Credit Transfer programme.
- v. Only students with Active registration status is allowed to make use of Credit Transfer programme.
- vi. Application for transfer of credit from other IHLs must be made within ONE (1) semester before enrolling the study programme at the University.

8.2.3 RULES AND REGULATIONS FOR EXEMPTION OF CREDIT AND TRANSFER OF CREDIT

Students can apply for Credit Exemption and/or Credit Transfer of any course based on the specified Rules and Regulations.

PASSING GRADE

- i. A minimum of Grade C according to the University's grading system is required for Credit Exemption.
- ii. A minimum of a Passed grade as set by the Faculty is required for Credit Transfer.

CREDIT VALUE

Courses that are given Credit Exemption and Credit Transfer must be equivalent to the courses in the curriculum of the programme pursued at the University with regards to calculation of academic load and credit value.

CONTENTS OF COURSE AND CURRICULUM

The contents of the course considered for Credit Exemption and Credit Transfer must be equivalent to the similar course in the present curriculum of the programme pursued. The contents of the course should be the same or not less than 80% of the similar course in the University.

- 1) Approval for Credit Exemption and Credit Transfer will only be given to the courses that are recognized by the government.
- 2) Combination of Item 1.4 and Item 2.2 above must not exceed 30% of the total credits required for a degree conferral of the programme of study. However, the Faculty can appeal to the Senate for a total that exceed 30%, subject to a maximum of 50%.
- 3) The courses given Credit Exemption and Credit Transfer will be recorded in the student's Academic Record.
- 4) Application for Transfer of Credit and Exemption of Credit should be done using Form UTM-E/3.8.
- 5) Approval for Credit Exemption and Credit Transfer will be given by the Faculty based on endorsement by the Faculty's Academic Committee.
- 6) Approval of Credit Exemption and Credit Transfer will be informed to the student.

8.3 REGULATIONS FOR STUDENTS WITH LESS THAN 80% ATTENDANCE

- i. Students who do not attend classes without any valid reason must be reminded or given written warning by the course lecturer.
- ii. When the absence of a student is more than 20%, the Faculty that offers the course can take the following actions:
 - (a) The student is not allowed to follow or continue any form of study tutorial/practical/studio and so forth) for that course.
 - (b) The student is not allowed to sit for forthcoming assessment (quiz, test, examination and so forth) for that course.
 - (c) The student will be given a zero (0) mark for that course, and he/she must repeat the course.
- iii. The Faculty needs to inform the actions taken to the student by writing.

***NOTE:** Actions taken by the Faculty on a student pertaining to the above matter do not need to be informed to the Senate.*

8.4 EXAMINATION REGULATION

In implementing the power granted under Section 13 Universiti Teknologi Malaysia (Examination) Act 1991, the Senate of UTM decides the following:

8.4.1 Requisites on sitting the Final Examination

- i. All registered and active students are required to sit for the final examination for all courses set by the Faculty, provided that the students have registered for the courses and have abide to the Regulation for Students less than 80% attendance as shown in Appendix III.
- ii. Faculty can defer examination for a sick student or for reasons acceptable to the University. The student is required to produce a Medical Certificate (endorsed by a government Doctor or University Medical Officer) or other supporting letter to the Dean of the Faculty not later than twenty-four (24) hours after the start of the examination of that course except for other reasons acceptable by the University.

8.4.2 Final Examination Supervision

- i. The supervisor for the final examination is the Dean of the Faculty.
- ii. The final examination supervisor is responsible to ensure that the examination is being invigilated strictly and systematically.
- iii. The final examination supervisor should appoint invigilators and assistant invigilators. Invigilators are members of the academic staff while assistant invigilators are members of the supporting staff.
- iv. The invigilators and assistant invigilators are answerable to the Supervisor of the Final Examination.

8.4.3 Monitoring Final Examination

- i. An invigilator is responsible for invigilating the final examination.
- ii. Unless permitted by the Examination Manager, at least TWO (2) invigilators should be appointed for every examination hall. One of them will be appointed as the Chief Invigilator.
- iii. Responsibilities of the Chief Invigilator are:
 - a. To report to the Supervisor of the Examination or his/her representative at the Faculty's office at least thirty (30) minutes before the examination starts. The Chief Invigilator will collect a sealed envelope containing the examination question papers and a list of names of students sitting for the examination.
 - b. Certify the attendance of Invigilators and assistant invigilators.
 - c. Instruct the assistant invigilators to distribute the answer booklets, attendance forms, and other examination requirements on each examination table and this should be done no later than FIFTEEN (15) minutes before the examination begins.
 - d. Instruct the students to enter the examination Hall/Room FIFTEEN (15) minutes before the examination begins.
 - e. Ensure that the students' attendance is noted and recorded correctly.
 - f. Announce the starting and ending time of the examination. Another announcement for the last FIFTEEN (15) minutes of the examination must also be made.
 - g. Remind the students regarding the consequences of the examination misconducts.
 - h. Ensure that the student is under close observation for any request from the student to leave temporarily examination hall for a specific purpose.
 - i. The chief invigilator is allowed to bar the students who disobey the examination regulation from sitting for the examination.
 - j. Report to the Examination Supervisor or his/her representative about any incident that violates the examination regulations, immediately after the end of the examination.

- k. At any time before the last FIFTEEN (15) minutes of the examination period, the Chief invigilator may allow any student to leave the examination hall if the student wishes to submit his/her answer scripts.
 - l. Instruct the invigilators and assistant invigilators to collect the answer scripts after the examination ends while students remain seated. Empty or unused answer booklets or answer scripts will be collected separately.
 - m. Responsible for counting and ensuring the number of answer booklets or scripts collected.
 - n. Responsible for handing over the answer booklets or scripts to the examination supervisor or his/her representative. Answer books/papers that are empty or unused are also to be submitted.
 - o. Should not allow suspending, postponing, or canceling any examination without the approval of the examination supervisor.
 - p. Present attendance form of the invigilators and assistant invigilators to the examination supervisor or his/her representative at the Faculty's office after the examination;
 - q. Collect information or evidence pertaining to any case of violation of examination rule and regulation and to surrender them to the examination supervisor or his/her representative.
 - r. Responsible to ensuring the smooth running of the examination; and
 - s. Authorized to act deemed to be appropriate in managing misconduct during examination.
- iv. Responsible of the Invigilator
- a. Report for duty to the Chief Invigilator at the examination hall/room THIRTY (30) minutes before the examination begins.
 - b. Distribute/place the question papers on the student table before the students are allowed to enter the examination hall.
 - c. Ensure that the information listed in the attendance slip/form matches the information on the student's identity card or matriculation card and course registration slip before collecting the attendance slip.
 - d. Collect the answer booklets/scripts after the examination has ended while students remain seated. Empty or unused answer scripts need to be collected separately.
 - e. Report to the chief invigilator if there is any misconduct observed during the examination.
 - f. Carry out other duties as instructed by the chief invigilator.
- v. Responsibilities of the Assistant Invigilator
- a. Report for duty to the examination supervisor or his representative at the faculty's office THIRTY (30) minutes before the examination starts. They are then expected to report for duty to the chief invigilator at the examination hall/room.
 - b. Assistant Invigilators are answerable to the chief invigilator and are expected to:
 - i. Bring all examination materials to the examination hall.
 - ii. Place the required examination materials on the student's table as instructed by the chief invigilator.
 - iii. Assist invigilators in collecting students' answer scripts/booklets.
 - iv. Return all examination materials after the examination has ended to the examination supervisor or his/her representative at the Faculty's office.
 - v. Carry out other duties as instructed by the chief invigilator.

8.4.4 Final Examination Etiquette

- i. Students are advised to be at the designated examination hall/room as listed in the examination schedule no later than FIFTEEN (15) minutes before the examination begins.
- ii. The Head of Invigilator may allow the students to enter the examination hall FIFTEEN (15) minutes before the examination starts. Students must behave appropriately when entering the hall.
- iii. Students who arrive late at the examination hall, but not later than THIRTY (30) minutes, will be allowed to sit for the examination but the end of the of the examination time will not be extended as it will the same for all the students.
- iv. Students who arrive THIRTY (30) minutes after the examination has started will not be allowed to enter the examination hall/room or sit for the examination.
- v. Students are not allowed to leave the examination hall/room for the first THIRTY (30) minutes after the examination has started and FIFTEEN (15) minutes before the examination ends. Students who wish to leave the examination hall at other time for any reason must obtain permission from the invigilator.
- vi. Students are required to bring the course registration slip along with their matriculation card/ identity card/ My Card or passport to the examination hall. All items must be placed at the right-hand corner of the desk for inspection by the invigilators.
- vii. Students who do not bring their course registration slip and matriculation or identity card will not be allowed to sit for the examination, except with written permission from the examination supervisor.
- viii. Students are prohibited from bringing any book, paper, picture, note, equipment with written notes, programmable calculator, communication device or any other devices, into the examination hall except those permitted by the chief invigilator. In addition, students are not allowed to receive any of the stated items from anyone while in the examination hall except those given by the Invigilator as permitted by the Vice Chancellor or recommended by the Faculty Examination Committee.
- ix. Any item borrowed by the student during the examination must be returned to the invigilators when the examination ends.
- x. Students must obey strictly all instructions given in the examination hall/room by the chief invigilator throughout the examination period.
- xi. Within fifteen (15) minutes before an examination starts, students are required to:
 - a) Fill-in the attendance slips, and the front page of the answer booklet/script as required; and
 - b) Read the examination questions without making any notes.
- xii. Students must write their names, My Card/passport numbers, course and programme codes, and any other required information on each answer book and attachments used.
- xiii. Students must read carefully and follow the instructions printed on the cover of the question paper.
- xiv. Students must ensure that they are given the correct question papers, with complete number of pages before attempting to answer. If there is mistake, students must immediately inform the invigilator.
- xv. All examination related work including rough work must be done in the answer books. Pages in the answer books must not be torn out.
- xvi. All answer books, whether used or unused, must not be brought out of the examination hall/ room.
- xvii. Students are prohibited from communicating with each other throughout the examination period.
- xviii. Students are prohibited from eating, drinking, or smoking in the examination hall/room.
- xix. At the end of the examination, students must ensure that their answer booklet/scripts (except empty or initial work) are organized and tied inclusive of the first copy of their attendance

- form according to the instructions given before handing them in to the invigilator.
- xx. Students must remain seated after the examination ends and should only leave the examination hall/room after being instructed to do so by the chief invigilator.
 - xxi. Students are not allowed to begin answering the questions before the examination starts and are not allowed to continue answering the questions after the examination period ends.
 - xxii. Students must enter and leave the examination hall/room in an orderly manner.
 - xxiii. Students are prohibited from referring or use any reference material inside or outside the examination hall/ room while the examination is being conducted, except those permitted by the chief invigilator.
 - xxiv. Students are not allowed to give or receive any kind of assistance from any party related to the examination during the examination, except those permitted by the chief invigilator.

8.4.5 Examination Misconduct

- i. Students are prohibited from committing any of the following examination misconducts:
 - (a) Distributing, receiving, or possessing any information in electronic, printed or any other forms that are related to the course being tested in the examination whether inside or outside the examination hall during the examination period unless with the permission from the chief invigilator; or
 - (b) Use the obtained information to answer the examination questions.
 - (c) Cheating or attempting to cheat or doing anything that may be deduced as cheating or attempting to cheat while the examination is being conducted; or
 - (d) Other misconducts as stated by the university.

8.4.6 Punishment

- i. If a student was found violating any of the Rules and Regulations of the examination, after being heard by the Faculty's Academic Committee and is found guilty, the Senate can decide on any one of the penalties, or a combination of two or more penalties listed below:
 - a) To give ZERO (0) mark for the course (inclusive of coursework); or
 - b) To give ZERO (0) mark for all courses registered in that semester.
- ii. Students who have found to act against the rules and regulations of the examinations for the second time will be dealt according to the Universities and Colleges Act, 1971, Procedures according to the Universiti Teknologi Malaysia (Student Code of Conduct), 1999.

8.5 PROCEDURES FOR APPEAL OF COURSE GRADE

- i. The faculty offering the course will display the results of the examination (grades only) of every course and programme. Students' identity will only be revealed by their Identity Card number (MyCard/ Passport).
- ii. The faculty offering the course would display the posted list of the examination results mentioned above not later than ten (10) days after the semester examination week ended. The results must be displayed for a minimum of ten (10) days on the notice board for students' appraisal, subject to a closing date set by the University. The University will also display the posted list on the University's website during that period.
- iii. Students can directly contact the lecturer if they feel that a mistake has been made. They are also allowed to review the examination answer script and to discuss with the lecturer if they did not satisfy with the grade awarded. If the students still were not satisfied after reviewing the script, they can apply for Appeal of Course Grade Results. The appeal is made for the answer script to be reviewed and re-marked. Students are however not allowed to make an Appeal of Course Grade Results without reviewing the examination answer script and discussing it with the lecturer.

- iv. The Appeal of Course Grade Results must be made within and not later than two (2) weeks after the final examination period ends.
- v. Students can obtain the Appeal of Course Grade Results form (Form UTM.E/5-1) at the Faculty. After the form has been filled in 4 copies, the student must make the necessary payment to the Bursar's Office based on the following procedures:
 - a) The fee for an appeal is RM50.00 for each course;
 - b) The Payment Instruction form can be obtained from the Academic Office of the Faculty;
 - c) The payment must be made in the form of cash, money order or postal order. Personal cheques are not accepted; and
 - d) All payments must be made personally by the student at the Bursar's Office. Payment made through mail will not be accepted and considered.
- vi. Students must personally submit the completed copies of the forms to the respective faculty that offer the course. One copy of the form must be kept by the student. When submitting the copies of the form to the respective faculty, the student will have to enclose the payment receipt.
- vii. If the appeal was made based on Item 3 above, the Faculty will review and re-mark the examination answer script of the student.
- viii. For servicing course, the respective faculty offering the course must submit a report on the review and the re- mark made as stated in Item 7 to the student's faculty.
- ix. Based on the review and re-mark made, a new mark based on the result of the re-mark will be awarded. If the result of the re-mark is lower than the original mark, the original mark will be retained. The faculty offering the course must update the student's examination records in the computer system.
- x. The faculty offering the course needs to inform the student about the result of the review and/or the result of the appeal.

8.6 PROCEDURES FOR APPLICATION OF DEGREE CONFERRAL

- i. Final semester students who are completing their studies must apply for the conferral of their Degree. Students who have applied for the conferral of their Degree but are unable to complete their study on time are required to re-apply for the conferral. The application submitted in the previous semester is invalid.
- ii. Students who are not eligible to apply (besides those mentioned in Item 1) will be fined RM50.00 if they applied.
- iii. The application must be made using the Application of Degree Conferral Form (in three copies) within a specified period set by the University. Students must bring all forms to the Faculty for endorsement. The first copy of the form must be submitted to the Faculty, the second copy to the Academic Advisor and a third copy for their record. Keeping. If the student fails to submit a copy to the Faculty, this will be considered that the student has not submitted his application form.
- iv. The closing date for the application is thirty (30) days before the start of the final examination. Application received within TWO (2) weeks after the closing date will be fined RM50.00.
- v. Students who do not submit the application form to the Faculty within the specific period will not be conferred in that semester. Nevertheless, they can submit their application within the specified period of the following semester.
- vi. Only students who have applied for the degree conferral within the specific period will be recommended by the Faculty to the Senate to be verified as eligible recipients of the Degree.
- vii. Students who have not applied for the conferral of Degree could not be considered for registration of a postgraduate study at the University.
- viii. Application for the conferral of Degree must be submitted not later than FIVE (5) years after the completion of study. Application submitted to the Faculty after the stated duration will not be entertained and the student is not eligible for conferral.

8.7 GUIDELINES FOR SHORT SEMESTER

8.7.1 Duration of Study

- i. Short Semester is an optional semester for students and will not be counted as a part of the Duration of Study set for a particular programme.
- ii. The Short Semester commences a week after the end of Semester II, and it is conducted over eight (8) weeks.
- iii. The duration of the Short Semester including final examination period and no specific provision is given for semester break and revision week.

8.7.2 Courses Offered

- i. Any course can be offered in the Short Semester.
- ii. The maximum number of credits that can be registered by students is limited to six (6) credit only.
- iii. Courses which have high percentages of failures students are encouraged to be offered in the Short Semester.

8.7.3 Registration of Courses

- i. Students are required to register each course taken during the Short Semester according to the existing regulations or procedures and within the specific period set by the University.
- ii. Students are allowed to withdraw any registered course, except for courses taken upon directive of the University. Course withdrawal (TD) must be carried out before the middle of the semester according to the procedures mentioned in Item 15 of Appendix I.
- iii. Faculties are required to decide on the total number of students who can register for a Section of each course that is offered.

8.7.4 Method of Computing Academic Achievement Results

- i. The students' GPA and CGPA will be calculated for the Short Semester. However, the academic standing of the students will not be determined.
- ii. The examination results of the Short Semester will be combined with the examination results of Semester I of the following session to determine the academic standing of the student.
- iii. The existing Regulations and Procedures for notifying examination results and Appeal of Course Grade will be applied for the Short Semester.

8.7.5 Tuition Fees

- i. The tuition fee chargeable to the students for the Short Semester is as follows:

(a) Rates for Tuition Fee

Type of Course	Fee
Diploma	RM15.00 per credit
Bachelor's Degree	RM45.00 per credit
Technology Social Science	RM45.00 per credit
Arts	RM35.00 per credit

- (b) Service Charge of RM110.00 is applied to respective students.

8.7.6 Method of Payment

- i. Students must pay all their fees for the Short Semester before or during course registration of that semester. Course registration of only those who have fully paid their fees will be accepted.
- ii. Students who fail to make full payment of the fees are strictly not allowed for course registration. In addition, students who have paid the fees but withdraw from the courses are not entitled for any refund after the official deadline of the course registration.

8.8 REGULATIONS AND GUIDELINES OF MINOR PROGRAMME

8.8.1 Registration of Minor Programme

- i. Continuing students who have been approved to follow a Minor programme must register for the programme at the students' Faculty according to the specific date set by the University.
- ii. Students are not allowed to change the Minor programme that has been registered.
- iii. Students are not allowed to have more than TWO (2) Minor programmes during their course of study.

8.8.2 Registration of Minor Programme's Courses

- i. Students can register for any course that is offered in the Minor programme with the permission of the students' Academic Advisor and the Faculty which offering the Minor programme.
- ii. Students are required to register for each Minor course that they plan to take for that semester according to the existing Regulations and Procedures and within the duration specified by the offering faculty.
- iii. Minor courses cannot be registered as Audit Status (HS).
- iv. Item 5.4 (ii) to item 5.4 (x) in Section 5 can be used except for Item 5.4 (v).

8.8.3 Passing Credit for Minor Programme and Duration of Study

- i. Students must pass all the required courses for the registered Minor programme.
- ii. The faculty that offers the Minor programme, with the University's approval, determines the total number of credits passed for that Minor.
- iii. Additional semester beyond the specified maximum duration of study will not be granted to those students who register for any Minor programme.

8.8.4 Exemption and Transfer of Credit for Minor Programme

- i. Exemption and Transfer of Credits will not be allowed for Minor programme.

8.8.5 Academic Standing

- i. The results of the Minor programme courses will be counted in the students' GPA and CGPA.
- ii. Failed Minor courses are not required to be repeated but the credits and credit points earned will be counted in the students' GPA and CGPA.

8.8.6 Minor Conferral

- i. Students will only be recorded a Minor in a particular course, in their transcript, after having:
- ii. Passed all the courses required by the registered Minor programme.
- iii. Applied for Minor conferral and with approval from the offering faculty.

8.8.7 Application for Minor Conferral

- i. Students who have fulfilled all the requirements for their Minor programme must submit the application together with the application for their degree conferral.
- ii. Application for Minor conferral cannot be done after the award of any degree.
- iii. Students who do not apply for their Minor conferral together with their degree conferral will not be awarded a Minor.

8.9 STUDENTS' CODE OF ATTIRE

1. Students must be neatly, tidily, and appropriately dressed according to the common practice of Malaysian society.
2. Students must dress decently (shirts, T-shirts with collar, shoes, slacks, long skirts below the knees) especially during lectures and official functions at the Faculty/administrative building.
3. Students should avoid dressing indecently in public by wearing inappropriate clothing such as:
 - a) Skirts or shorts that are at or above the knee level.
 - b) T-shirts without collars
 - c) Sleeveless clothes
 - d) Tight trousers or skirts
 - e) Flip-flops/sandals/slippers
4. Male students attending formal university functions must dress neatly in clothes such as long sleeve shirt, necktie, slacks (not jeans), leather shoes or complete national attire. Female students are required to dress in Baju Kurung or in loose clothes such as long skirts that go below the knees or loose trousers.
5. Female students are not allowed to wear clothes that cover their faces (purdah).
6. During official University functions, students are not allowed to wear cap or bandana.
7. Male students are not allowed to keep long hair (reaching the collar, covering the ears, and reaching the eyebrows), have ponytails, dyed hair and untidy hairstyles.
8. Male students are not allowed to dress in female attire and vice-versa.
9. Male students are not permitted to wear bangles, ear studs, necklaces and earrings or any jewelry whereas female students should not have pierced body parts other than the ones accepted as the norms of the Malaysian society.
10. Tattoos are not permitted on any part of the body.
11. Participation in the laboratories, sports and cultural activities require students to be appropriately dressed according to the Rules and Regulations set by the University.
12. Students are required to wear matriculation card within the vicinity of the University or university owned premises inclusive of rented premises. The card must be worn and displayed around the chest area.

"Students who do not abide by the Rules and Regulations can be given warnings or fine of not more than RM50.00 (first offence) and will be summoned by the Disciplinary Committee for repeated offences."