UTM
UNIVERSITI TEKNOLOGI MALAYSIA

School of Biomedical Engineering and Health Sciences

FACULTY OF ENGINEERING
UNIVERSITI TEKNOLOGI MALAYSIA

UNDERGRADUATE
HANDBOOK
2021/2022

https://engineering.utm.my/biomedical/

Premier Digital Tech Institution

REVISED VERSION 2.0

School of Biomedical Engineering and Health Sciences (SBEHS)

Faculty of Engineering

UTM
UNIVERSITI TEKNOLOGI MALAYSIA
School of Biomedical Engineering and Health Science

ORGANIZATIONAL CHART

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Assoc. Prof. Ir. Dr. Azli Yahya

ASSOCIATE CHAIR (FACILITIES)
Assoc. Prof. Dr. Maheza Irna Mohamad Salim

DIRECTOR (CLINICAL SCIENCE AND SPORT TECH)
Dr. Aizreena Azaman

DIRECTOR (BIOMEDICAL ENGINEERING)
Assoc. Prof. Ir. Dr. Tan Tian Swee

MANAGEMENT TEAM	
Chair	Dr. Ahmad Zahran Md Khudzari zahran@biomedical.utm.my
Associate Chair (Quality and Strategy)	Assoc. Prof. Ir. Dr. Azli bin Yahya azli@fke.utm.my
Associate Chair (Facilities)	Assoc. Prof. Dr. Maheza Irna binti Mohamad Salim maheza@biomedical.utm.my
Director (Biomedical Engineering)	Assoc. Prof. Ir. Dr. Tan Tian Swee tantswee@biomedical.utm.my
Director (Clinical Sciences and Sports Technology)	Dr. Aizreena binti Azaman aizreena@biomedical.utm.my
ACADEMIC TEAM	
Academic Manager	Dr. Kamaruzaman bin Soeed skamaruzaman@utm.my
Undergraduate Program Coordinator (Biomedical Engineering)	Dr. Hau Yuan Wen hauyuanwen@utm.my
Undergraduate Program Coordinator (Equine Management)	Dr. Fuziaton bt Baharudin fuziaton@utm.my
Undergraduate Program Coordinator (Biomedical Engineering-SPACE)	Ts. Dr. Mohd Riduan bin Mohamad mohd.riduan@utm.my
Postgraduate Program Coordinator (Taught Course)	Dr. Siti Ruzita binti Mahmod sruzita@biomedical.utm.my
Postgraduate Program Coordinator (Research)	Dr. Izwyn Zulkapri izwyn@biomedical.utm.my
ACADEMIC OFFICE	
Administrative Staff (Undergraduate Programmes)	Mrs. Shaeza binti Shazali shaeza@utm.my Mrs. Zulbaidah binti Muhammad idah@fbb.utm.my
Administrative Staff (Postgraduate Programmes)	Mrs. Noor Hafizah binti Rahamad hafizahr@utm.my

Bachelor of Engineering (Biomedical) with Honours

Programme Specifications

The Bachelor of Engineering (Biomedical) with Honours is offered on a full-time basis. The full-time programme is offered only at the UTM Johor Bahru campus. Student enrolment for full-time programme is subjected to the student's entry qualifications and the duration of study is between four (4) to six (6) years.

The curriculum is planned based on a 2-semester per academic session. Generally, students are expected to undertake courses between twelve (12) to eighteen (18) credit hours per semester or equivalent for credit exemption. Assessment is based on coursework and final examinations given throughout the semester.

General Information

1. Awarding Institution	Universiti Teknologi Malaysia
2. Teaching Institution	Universiti Teknologi Malaysia
3. Programme Name	Bachelor of Engineering (Biomedical) with Honours
4. Final Award	Bachelor of Engineering (Biomedical) with Honours
5. Programme Code	SEBBH-01
6. Professional or Statutory Body of Accreditation	Malaysian Qualification Agency Engineering Accreditation Council
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 years Maximum: 6 years

Course Classification

No.	Classification	Credit Hours	Percentage
i.	University Courses a. General b. Language c. Co-Curriculum	 12 8 3	16.7%
ii.	Faculty & Programme Core	106	76.8%
iii.	Programme Electives	9	6.5%
	Total	**138**	**100%**
A	Engineering Courses (a) Lecture/Project/Laboratory (b) Industrial Training (c) Final Year Project	 97 5 6	**78.3%**
Total Credit Hours for Part A		**108**	
B	Related Courses (a) Applied Science/Mathematic/Computer (b) Management/Law/Humanities/Ethics/Economy (c) Language (d) Co-Curriculum	 15 4 8 3	**21.7%**
Total Credit Hours for Part B		**30**	
Total Credit Hours for Part A and B		**138**	**100%**
Total Credit Hours to Graduate		**138 credit hours**	

Programme Educational Objectives (PEO)

After having exposed to 3 to 5 years working experience, our graduates should become professionals who demonstrate the following competencies:

Code	Programme Education Objectives
PEO1	Biomedical engineers with competency to work in biomedical industry.
PEO2	Biomedical engineers with leadership positions in the biomedical engineering sector.
PEO3	Biomedical engineers embrace professional development through biomedical engineering practice and life-long learning.
PEO4	Biomedical engineers who conduct their professional work ethically and contribute towards societal responsibilities.

Programme Learning Outcomes (PLO)

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

Code	Programme Learning Outcomes
PLO1	Apply knowledge of science and engineering fundamentals to the solution of complex biomedical engineering problems.
PLO2	Identify, formulate and solve complex biomedical engineering problems through structured literature research and scientific approach using first principles of mathematics, natural sciences and engineering sciences.
PLO3	Design solutions for complex biomedical engineering problems with consideration for public health and safety, cultural, societal, and environmental needs.
PLO4	Conduct investigation into complex Biomedical Engineering problems using research-based knowledge and methodology to provide scientific conclusions.
PLO5	Select and apply appropriate techniques, resources, and modern medical engineering and IT tools, to complex biomedical engineering activities, with an understanding of the limitations.
PLO6	Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues to professional biomedical engineering practice.

PLO7	Understand the role of biomedical engineers in society regarding social, cultural, environmental and global responsibilities for sustainable development.
PLO8	Ability to evaluate and make appropriate professional decision by taking into account ethical principles, social and environmental responsibilities.
PLO9	Communicate effectively on complex engineering activities through written, oral, visual and graphical forms to colleagues and society at large.
PLO10	Develop leadership attributes and be committed in achieving common goals in multi-disciplinary setting using good team working skills.
PLO11	Ability to adapt with the latest development within the biomedical engineering field for life-long learning and continuous knowledge improvement.
PLO12	Demonstrate knowledge and understanding of management and financial aspects of biomedical engineering and develop entrepreneurship skills.

Entry Requirements

For Malaysian Students

STPM Holders:

1. A pass with credit in Bahasa Melayu/ Bahasa Malaysia at SPM level, **and**
2. A pass in Malaysian Higher School Certificate (STPM) with at least C grade (CGPA 2.00) in General Paper and C grade (CGPA 2.00) in any two of the taken subjects in the STPM, **and**
3. Attained a minimum Band 2 in Malaysian University English Test (MUET).

STAM Holders:

1. A pass with credit in Bahasa Melayu/ Bahasa Malaysia at SPM level, **and**
2. A pass in STAM Qualification for at least Jayyid level, **and**
3. Attained a minimum Band 2 in Malaysian University English Test (MUET).

Matric/ Asasi Holders:

1. A pass with credit in Bahasa Melayu/ Bahasa Malaysia at SPM level, **and**
2. A pass in Malaysian Matriculation Certificate / Foundation with minimum CGPA of 2.00, **and**
3. Attained a minimum Band 2 in Malaysian University English Test (MUET).

A-Level /IB/ Ausmat Holders:

1. A pass with credit in Bahasa Melayu/Bahasa Malaysia at SPM level / Equivalent, **and**
2. Hold A – Level / International Baccalaureate / Australian Matriculation (Ausmat) Certificate, **and**
3. Attained a minimum Band 2 in Malaysian University English Test (MUET)/ Band 5.5 in IELTS/ Score of 500 in TOEFL PBT/ Score of 59 in TOEFL IBT.

Diploma Holders:

1. A pass with credit in Bahasa Melayu/ Bahasa Malaysia at SPM level, **and**
2. Hold Diploma / Equivalent recognized by Malaysian government and approved by the University Senate or a pass in Malaysian Higher School Certificate (STPM) with at least C Grade (CGPA 2.00) in General Paper and C Grade (CGPA 2.00) in any two of the taken subject in the STPM, **and**
3. Attained a minimum Band 2 in Malaysian University English Test (MUET).

Diploma Vokasional Holders:

1. Hold Sijil Vokasional Malaysia (SVM) equivalent to Sijil Pelajaran Malaysia (SPM) with at least Academic PNGK 2.00, at least PNGK 2.67 and competent vokasional modules and credit in Bahasa Melayu SVM kod 1104, **and**
2. Hold Diploma Vokasional recognized by Malaysian government and approved by the University Senate, **and**
3. Attained a minimum Band 2 in Malaysian University English Test (MUET).

Special Requirements for the Programme

1. Comply to university general requirements, **and**
2. Comply to special requirements for the programme.

   Please refer to *https://admission.utm.my/entry-requirements-ug-malaysian/* for further details.

3. Do not have any physical disabilities

For International Students

General Entry Requirements:

1. A Senior High School Certificate or equivalent pre - university qualifications. Refer to https://admission.utm.my/general-entry-requirement/ for the entry requirements based on country, **and**
2. Pass the English Proficiency requirements.
3. Attained a minimum Band 3 in Malaysian University English Test (MUET)/ Band 5.5 in IELTS/ Score of 46 in TOEFL iBT.
4. Pass the Health requirements.

Health Requirements:

International student are required to undergo a compulsory medical check up in Malaysia (managed by the University) and you must be certified as being in good health and free from contagious/ infectious diseases or illness that will adversely affect your study. International students from the yellow fever endemic areas without a valid immunisation certificate will be immediately quarantined on arrival for 6 days minus the period of travel. The university has the right to withdraw this offer or to terminate you from your study if you are found to suffer from or to be a carrier of contagious/ infectious diseases, or to suffer from a

medical condition requiring continuous medical care that will adversely affect your study at UTM. Refer to https://admission.utm.my/health-requirements/ for the details Health requirements.

English Proficiency:

If English is not your native language and you are attending a school where English is not the language of instruction, you must take the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System Academic (IELTS Academic). You can also enroll in the Certified Intensive English Programme (CIEP) offered by ELS Language Centre. The CIEP is available completely online and you can take it while you are in home country. Refer to https://admission.utm.my/health-requirements/ for the details English Proficiency.

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

Award Requirements

To graduate, students must:

- Attain a total of not less than 138 credit hours with a minimum CGPA of 2.0.
- Professional Skill Certificate (PSC) - **Three** compulsory courses and **two** elective courses.

To pass each courses, students must:

- Attain passing grade which is D+ (40 marks and above); and attain 20% and above in final examination.
- Attain HL (Passing) grade in course registered with Pass-Fail status (HW).

Marking and Assessment

The Relationship Involving Marks, Grades and Point Values			
Marks	**Grade**	**Point**	**Result Status**
90 - 100	A+	4.00	**PASS**
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	**FAIL**
30 - 34	D-	0.67	
00 - 29	E	0.00	

Student Exchange Programme

Student Exchange programme is a programme which will allow the students to spend one or two semesters at universities abroad and take courses in a regular semester with credit transfer opportunities. Students are encouraged to study at universities partners all around the world.

Students who choose to undertake a Student Exchange programme will do so on an Exchange-basis, i.e. students study overseas at one of UTM's many partner universities for one or two semesters. In the student exchange programme, the student will study overseas at one of UTM's many partner universities which students usually entitled for tuition fees waiver depend on the available quotas.

The programme is open to the undergraduates with the following conditions:

(i) Registered as an active student at Universiti Teknologi Malaysia
(ii) Must complete at least one-semester study in UTM (one semester) and must NOT be in the last semester of study in UTM.
(iii) Have a grade point average of 3.0 or higher. The students with grade point average lower than 3.0 are required to provide UTM international with a supporting letter/approval letter from the respective faculty.

For detailed information, please refer to UTM international website at https://www.utm.my/international/

Study Abroad Programme

Student Abroad programme is a programme which will allow the students to spend one or two semesters at universities abroad and take courses in a regular semester with credit transfer opportunities. Students are encouraged to study at universities partners all around the world.

Students who choose to undertake a Study Abroad programme will study overseas at a non-partner university of their choice and need to pay tuition fees to the host university. The students apply to the host university with the assistance of the UTM International and will continue to pay the tuition fees to UTM.

The programme is open to the undergraduates with the following conditions:

(i) Registered as an active student at Universiti Teknologi Malaysia
(ii) Must complete at least one-semester study in UTM (one semester) and must NOT be in the last semester of study in UTM.
(iii) Have a grade point average of 3.0 or higher. The students with grade point average lower than 3.0 are required to provide UTM international with a supporting letter/approval letter from the respective faculty.

For detailed information, please refer to UTM international website at https://www.utm.my/international/

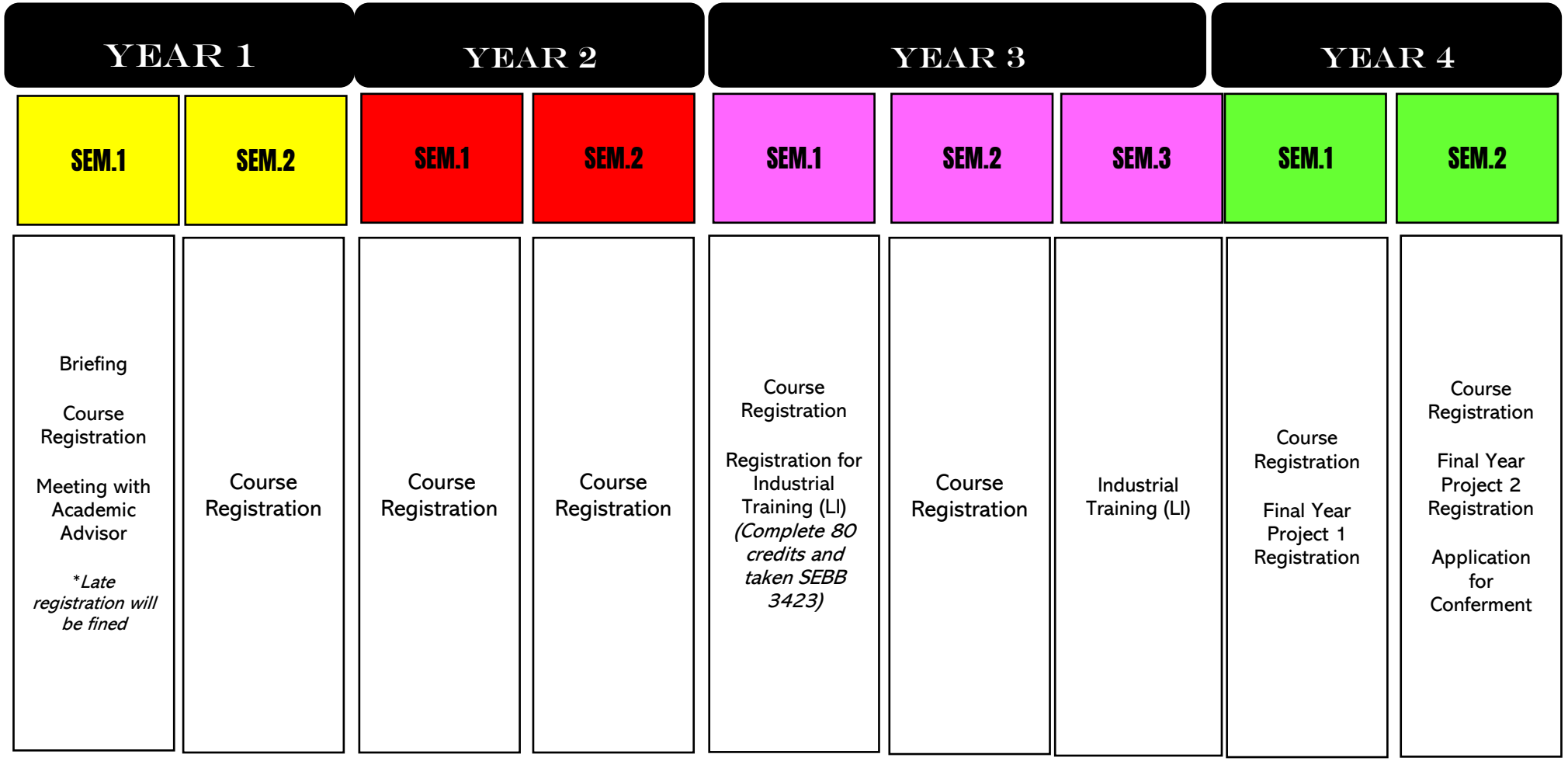
Professional Skills Certificate (PSC)

Students must enrol in **three** compulsory and **two** elective courses offered by the Centres of Excellence For Academic and Experiental Learning (CAEL) in the University as part of the award requirement. These certificate courses can be referred in the following table:

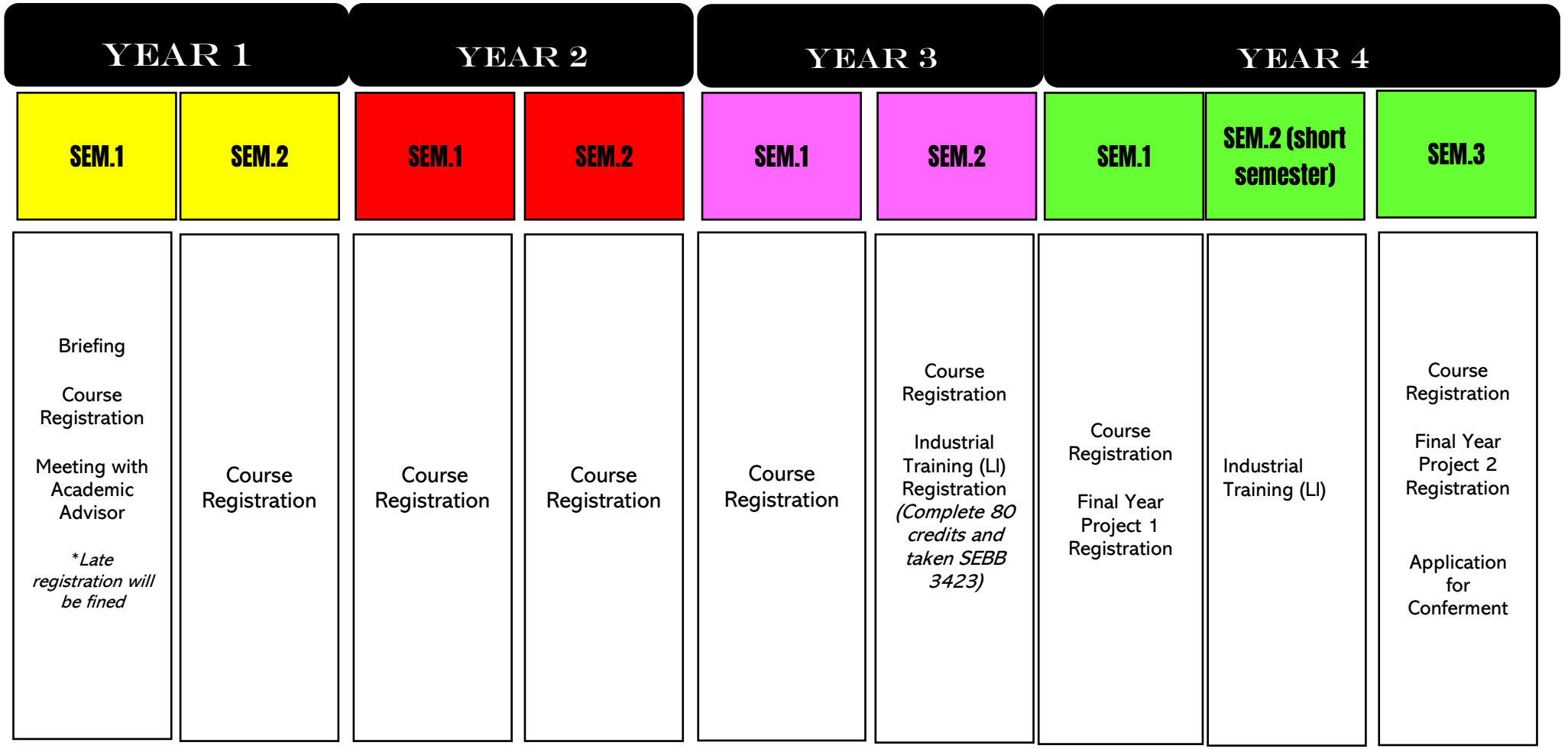
No	Course Name (Compulsory)	Course Code
1	Design Thinking For Entrepreneur	GLRB0010
2	Talent and Competency Management	GLRM0010
3	English Communications Skill For Graduating Students (ECS)	GLRL0010

No	Course Names (Electives)	Course Code
1	Data Analytics For Organization	GLRT0010
2	Professional Ethics and Integrity	GLRM0020
3	Construction Measurement (Mechanical & Electrical)	GLRT0020
4	Oshe For Engineering Industry and Laboratory	GLRT0030
5	Oshe For Construction Industry and Laboratory Works	GLRT0040
6	Quality Management For Built Environment and Engineering Professionals	GLRT0050
7	Safety and Health Officer Introductory Course	GLRT0060

Overall flowchart as SEBB student (1st Intake – October)



Overall flowchart as SEBB student (2nd Intake – March)



Course Menu –Intake 2021/2022 Semester 1 (October Intake)

YEAR 1 (SEMESTER 1)			
Code	**Courses**	**Credit**	**Pre-req**
SEBB 1012	Introduction to Biomedical Engineering	2	
SEBB 1513	Basic Anatomy and Physiology	3	
SEEU 1023	Circuit Theory	3	
SSCE 1693	Engineering Mathematics 1	3	
UHLB 1112	English Communication Skills	2	
UHMS 1182	Appreciation of Ethics and Civilisations (Local)	2	
UHLM 1012	Malay Language Communication 2 (International)		
UHMT 1012	Graduate Success Attributes	2	
TOTAL CREDIT HOURS		**17**	

YEAR 1 (SEMESTER 2)			
Code	**Courses**	**Credit**	**Pre-req**
SEBB 1523	Advanced Anatomy and Physiology	3	SEBB 1513
SEBB 1313	Statics and Dynamics	3	
SEEU 1223	Digital Electronics	3	
SSCE 1793	Differential Equations	3	
UHIS 1022	Philosophy And Current Issues	2	
UHL* 1112	Elective of Foreign Language	2	
TOTAL CREDIT HOURS		**16**	

YEAR 2 (SEMESTER 1)			
Code	**Courses**	**Credit**	**Pre-req**
SEEU 2073	Signals and Systems	3	

SEEU 1063	Electronic Devices	3	
UBSS 1032	Introduction to Entrepreneurship	2	
SEBB 2712	Laboratory 1	2	
SSCE 1993	Engineering Mathematics 2	3	SSCE 1693
UHLB 2122	Academic Communication Skills	2	UHLB 1112
SEBB 2033	Computer Programming for Biomedical Engineer	3	
TOTAL CREDIT HOURS		**18**	

YEAR 2 (SEMESTER 2)			
Code	**Courses**	**Credit**	**Pre-req**
UKQ* 2**2	Elective of Service-Learning Co-Curriculum	2	
UHII 2132	Islamic Entrepreneurship	2	
UHMS 2022	Critical and Creative Thinking		
UHIT 2302	Science and Technology Thinking	2	
SEEU 2523	Electromagnetic Field Theory	3	SSCE 1993
SSCE 2193	Engineering Statistics	3	
SEEU 3133	System Modelling and Analysis	3	
SEBB 2513	Basic Rehabilitation	3	
TOTAL CREDIT HOURS		**18**	

YEAR 3 (SEMESTER 1)			
Code	**Courses**	**Credit**	**Pre-req**
SEEU 3063	Electronic Circuits and Systems	3	SEEU 1063
SEEU 3533	Communication Principles	3	SEEU 2073
SEBB 3712	Laboratory 2	2	
SEBB 3313	Biomedical Materials	3	

SSCE 2393	Numerical Methods	3	
SEBB 3423	Clinical Engineering	3	
TOTAL CREDIT HOURS		**17**	

YEAR 3 (SEMESTER 2)			
Code	**Courses**	**Credit**	**Pre-req**
SEBB 3323	Solid Mechanics	3	SEBB 1313
SEBB 3023	Biomedical Imaging	3	
SEBB 3722	Laboratory 3	2	
SEBB 3033	Microprocessor Systems	3	
SEBB 3043	Instrumentation and Measurement in Biomedical	3	
UHLB 3132	English for Professional Purposes	2	UHLB 2122
TOTAL CREDIT HOURS		**16**	

SHORT SEMESTER			
Code	**Courses**	**Credit**	**Pre-req**
SEBB 4915	Industrial Training (HW)	5	SEBB 3423
TOTAL CREDIT HOURS		**5**	

YEAR 4 (SEMESTER 1)			
Code	**Courses**	**Credit**	**Pre-req**
SEBB 4313	Biomedical Systems Design	3	SEBB 3722
SEBB 4413	Biochemistry for Biomedical Engineers	3	
SEBB 4712	Laboratory 4	2	
SEBB 4812	Project Part 1	2	
SEBB 4023	Biomedical Signal Processing	3	SEEU 2073
SEBB 4**3/ 5***	Elective 1	3	
UKQT 3001	Extracurricular Experiential Learning (ExCEL)	1	
TOTAL CREDIT HOURS		**17**	

YEAR 4 (SEMESTER 2)			
Code	**Courses**	**Credit**	**Pre-req**
SEBB 4824	Project Part 2	4	SEBB 4812
SEBB 4**3/ 5***	Elective 2	3	
SEBB 4**3/ 5***	Elective 3	3	
SHAS 4542	Engineering Management	2	
SEBB 4032	Professional Biomedical Engineering Practice	2	
TOTAL CREDIT HOURS		**14**	

Total Credits Earned: 138

Course Menu – Intake 2021/2022 – Semester 2 (March Intake)

YEAR 1 (SEMESTER 1) 21/22-2			
Code	**Courses**	**Credit**	**Pre-req**
SEBB 1313	Statics and Dynamics	3	
SEBB 1513	Basic Anatomy and Physiology	3	
SEEU 1223	Digital Electronics	3	
SSCE 1693	Engineering Mathematics 1	3	
UHLM 1012	Malay Language Communication 2 (International)	2	
UHIS 1022	Philosophy And Current Issues	2	
TOTAL CREDIT HOURS		**16**	

YEAR 1 (SEMESTER 2) 22/23-1			
Code	**Courses**	**Credit**	**Pre-req**
SEBB 1012	Introduction to Biomedical Engineering	2	
SEBB 1523	Advanced Anatomy and Physiology	3	SEBB 1513
SEEU 1023	Circuit Theory	3	
SSCE 1793	Differential Equations	3	
UHMT 1012	Graduate Success Attributes	2	
UHL* 1112	Elective of Foreign Language	2	
TOTAL CREDIT HOURS		**15**	

YEAR 2 (SEMESTER 3) 22/23-2			
Code	**Courses**	**Credit**	**Pre-req**
UKQ* 2**2	Elective of Service-Learning Co-Curriculum	2	
UHII 2132	Islamic Entrepreneurship	2	
UHMS 2022	Critical and Creative Thinking		
UHIT 2302	Science and Technology Thinking	2	
SSCE 2193	Engineering Statistics	3	

SEEU 3133	System Modelling and Analysis	3	
SEBB 3323	Solid Mechanics	3	
SEBB 2513	Basic Rehabilitation	3	
TOTAL CREDIT HOURS		**18**	

YEAR 2 (SEMESTER 4) 23/24-1			
Code	**Courses**	**Credit**	**Pre-req**
SEEU 2073	Signals and Systems	3	
SEEU 1063	Electronic Devices	3	
UBSS 1032	Introduction to Entrepreneurship	2	
SEBB 2712	Laboratory 1	2	
SSCE 1993	Engineering Mathematics 2	3	SSCE 1693
UHLB 2122	Academic Communication Skills	2	UHLB 1112
SEBB 2033	Computer Programming for Biomedical Engineer	3	
TOTAL CREDIT HOURS		**18**	

YEAR 3 (SEMESTER 5) 23/24-2			
Code	**Courses**	**Credit**	**Pre-req**
SEBB 3023	Biomedical Imaging	3	
SEBB 3033	Microprocessor Systems	3	
SEBB 3043	Instrumentation and Measurement in Biomedical	3	
SEBB 3423	Clinical Engineering	3	
SEEU 2523	Electromagnetic Field Theory	3	SSCE 1993
UHLB 3132	English for Professional Purposes	2	UHLB 2122
TOTAL CREDIT HOURS		**17**	

YEAR 3 (SEMESTER 6) 24/25-1			
Code	**Courses**	**Credit**	**Pre-req**
SEBB 3313	Biomedical Materials	3	
SEBB 4023	Biomedical Signal Processing	3	SEEU 2073
SEBB 3712	Laboratory 2	2	
SEEU 3063	Electronic Circuits and Systems	3	SEEU 1063
SEEU 3533	Communication Principles	3	SEEU 2073
SSCE 2393	Numerical Methods	3	
TOTAL CREDIT HOURS		**17**	

YEAR 4 (SEMESTER 7) 24/25-2			
Code	**Courses**	**Credit**	**Pre-req**
SEBB 3722	Laboratory 3	2	
SEBB 4812	Project Part 1	2	
SHAS 4542	Engineering Management	2	
SEBB 4032	Professional Biomedical Engineering Practice	2	
SEBB 4**3/ 5***	Elective 1	3	
SEBB 4**3/ 5***	Elective 2	3	
TOTAL CREDIT HOURS		**14**	

SHORT SEMESTER			
Code	**Courses**	**Credit**	**Pre-req**
SEBB 4915	Industrial Training (HW)	5	SEBB 3423
TOTAL CREDIT HOURS		**5**	

YEAR 4 (SEMESTER 8) 25/26-1			
Code	**Courses**	**Credit**	**Pre-req**
SEBB 4313	Biomedical Systems Design	3	SEBB 3722
SEBB 4413	Biochemistry for Biomedical Engineers	3	

SEBB 4**3	Elective 3	3	
SEBB 4824	Project Part 2	4	SEBB 4812
SEBB 4712	Laboratory 4	2	
UKQT 3001	Extracurricular Experiential Learning (ExCEL)	1	
TOTAL CREDIT HOURS		**16**	

Total Credits Earned: 136 + 2 (Transfer credits of UHLB 1112)

Elective Courses

Code	Courses	Credit	Pre-req
SEBB 4043	Biomedical Image Processing	3	SEBB 3023
SEBB 4053	Biosystem Modelling	3	
SEBB 4063	Advanced Biomedical Signal Processing	3	SEBB 4023
SEBB 4083	Artificial Intelligence	3	
SEBB 4323	Biomedical Devices	3	
SEBB 4343	Cell and Tissue Engineering	3	
SEBB 4433	Biomedical Instrumentation Management	3	
SEBB 4513	Rehabilitation Engineering	3	SEBB 2513
SEBB 4113	Bio-Fabrication	3	
SEBB 4123	Bio-Material Characterization and Analysis	3	
SEBB 4133	Machining and Testing for Biomedical Engineer	3	
SEBB 4153	Electronic CAD Digital System Design	3	
SEBB 4163	Advance Computer Programming and Data Structure	3	
SEBB 5003	Biomedical Measurement Technique	3	
SEBB 5013	Diagnostic and Therapeutic Technology	3	
SEBB 5023	Advanced Biomedical Engineering	3	
SEBB 5033	Medical Informatics	3	

SEBB 5043	Biomechanics	3	

Elective of Language Skills Courses

Code	Courses	Credit	Pre-req
UHLA 1112	Arabic Language	2	
UHLJ 1112	Japanese Language 1	2	
UHLC 1112	Mandarin Language 1	2	
UHLJ 1112	France Language	2	
UHLN 1112	Persian Language	2	

Graduation Checklist

To graduate, students must pass all the stated courses in this checklist. It is the responsibility of the students to ensure that all courses are taken and passed. Students who do not complete any of the course are not allowed to graduate.

No	Code	Course	Credit Earned (JKD)	Credit Counted (JKK)	Tick (√) If Passed
Biomedical Engineering Courses					
1	SEBB 1012	Introduction to Biomedical Engineering	2	2	
2	SEBB 1513	Basic Anatomy and Physiology	3	3	
3	SEEU 1023	Circuit Theory	3	3	
4	SSCE 1693	Engineering Mathematics 1	3	3	
5	UHLB1112	English Communication Skills	2	2	
6	UHMS 1182	Appreciation of Ethics and Civilisations (Local)	2	2	
7	UHLM 1012	Malay Language Communication 2 (International)			
8	UHMT 1012	Graduate Success Attributes	2	2	

9	SEBB 1523	Advanced Anatomy and Physiology	3	3	
10	SEBB 1313	Statics and Dynamics	3	3	
11	SEEU 1223	Digital Electronics	3	3	
12	SSCE 1793	Differential Equations	3	3	
13	UHIS 1022	Philosophy And Current Issues	2	2	
14	UHL* 1112	Elective of Foreign Language	2	2	
15	SEEU 2073	Signals and Systems	3	3	
16	SEEU 1063	Electronic Devices	3	3	
17	UBSS 1032	Introduction to Entrepreneurship	2	2	
18	SEBB 2712	Laboratory 1	2	2	
19	SSCE 1993	Engineering Mathematics 2	3	3	
20	UHLB 2122	Academic Communication Skills	2	2	
21	SEBB 2033	Computer Programming for Biomedical Engineer	3	3	
22	UKQ* 2**2	Elective of Service Learning Co-Curriculum	2	2	
23	UHII 2132	Islamic Entrepreneurship	2	2	
24	UHMS 2022	Critical and Creative Thinking			
25	UHIT 2302	Science and Technology Thinking	2	2	
26	SEEU 2523	Electromagnetic Field Theory	3	3	
27	SSCE 2193	Engineering Statistics	3	3	
28	SEEU 3133	System Modeling and Analysis	3	3	
29	SEBB 2513	Basic Rehabilitation	3	3	
30	SEEU 3063	Electronic Circuits and Systems	3	3	
31	SEEU 3533	Communication Principles	3	3	
32	SEBB 3712	Laboratory 2	2	2	
33	SEBB 3313	Biomedical Materials	3	3	
34	SSCE 2393	Numerical Methods	3	3	
35	SEBB 3423	Clinical Engineering	3	3	
36	SEBB 3323	Solid Mechanics	3	3	
37	SEBB 3023	Biomedical Imaging	3	3	
38	SEBB 3722	Laboratory 3	2	2	
39	SEBB 3033	Microprocessor Systems	3	3	
40	SEBB 3043	Instrumentation and Measurement in Biomedical	3	3	
41	UHLB 3132	English for Professional	2	2	

		Purposes			
42	SEBB 4915	Industrial Training (HW)	5	HL	
43	SEBB 4313	Biomedical Systems Design	3	3	
44	SEBB 4413	Biochemistry for Biomedical Engineers	3	3	
45	SEBB 4712	Laboratory 4	2	2	
46	SEBB 4812	Project Part 1	2	2	
47	SEBB 4023	Biomedical Signal Processing	3	3	
48	SEBB 4**3/ SEBB 5***	Elective 1	3	3	
49	UKQT 3001	Extracurricular Experiential Learning (ExCEL)	1	1	
50	SEBB 4824	Project Part 2	4	4	
51	SEBB 4**3/ SEBB 5***	Elective 2	3	3	
52	SEBB 4**3/ SEBB 5***	Elective 3	3	3	
53	SHAS 4542	Engineering Management	2	2	
54	SEBB 4032	Professional Biomedical Engineering Practice	2	2	
TOTAL CREDIT TO GRADUATE (a + b + c)			**138**	**133**	
Other Compulsory Courses					
Professional Skills Certificate (PSC) (UTMSPACE/ School)					
COMPULSORY(3)					
1	GLRB0010	Design Thinking For Entrepreneur			
2	GLRM0010	Talent and Competency Management			
3	GLRL0010	English Communications Skill For Graduating Students (ECS)			
ELECTIVE(2)					
1	GLRT0010	Data Analytics For Organization			
2	GLRM0020	Professional Ethics and Integrity			
3	GLRT0020	Construction Measurement (Mechanical & Electrical)			
4	GLRT0030	Oshe For Engineering Industry and Laboratory			
5	GLRT0040	Oshe For Construction Industry and Laboratory Works			
6	GLRT0050	Quality Management For Built Environment and Engineering Professionals			
7	GLRT0060	Safety and Health Officer Introductory Course			

Course Synopsis

Core Courses

SEEU 1023 Circuit Theory
This course introduces students to the basic laws, concept of series and parallel circuits, methods of analysis and theorems for direct current, DC and alternating current, AC circuit, such as Ohms Law, Kirchhoff's Current and Voltage Laws, Mesh and Nodal Analysis and Thevenin's and Norton's Theorems. With the knowledge learned, the student would be able to apply the basic laws, theorem and methods of analysis for solving a simple DC and AC circuits.

SEEU 1223 Digital Electronics
This course teaches the fundamental principles of digital systems. From the signal concepts and the importance of numbers systems and codes, it then proceeds to logic gates, their relationship to Boolean algebra and the integration of gates to form complex circuits. The course emphasizes on techniques to design, analyze, plan, and implement simple digital systems using gates and MSI circuits. Simulation software Quartus 2 will also be introduced to facilitate the learning process.

SEEU 2073 Signals and Systems
This course introduces the students the fundamental ideas of signals and system analysis. The signal representations in both time and frequency domains and their effects on systems will be explored. Specifically, the topics covered in the course include basic properties of continuous-time and discrete-time signals, the processing of signals by linear time-invariant (LTI) systems, Fourier series, Fourier and Laplace transforms. Important concepts such as impulse response, frequency response and system transfer functions as well as techniques of filtering and filter design, modulation, and sampling, are discussed and illustrated. This course will serve as a central building block for students in studying information processing in many engineering fields such as control systems, digital signal processing, communications, circuit design, etc.

SEEU 1063 Electronics Devices
This is the first course in the field of electronics and an introduction course to semiconductor devices used in today's electronics, such as diode, bipolar junction transistor, and field effect transistor. The course content includes the devices' basic structure, biasing, and basic applications. The goal is to develop an excellent understanding of the operation capabilities and limitation of the devices so that the students will be able to use these devices effectively in analog and digital circuit design.

SEBB 2033 Computer Programming Techniques for Biomedical Engineer
As a fundamental subject, this course equips the students with theory and practice on basic programming and problem solving techniques by using the structured approach. From this course, the students will be equipped with skills of basic C/C++ programming to solve simple to moderate problems that related with biomedical engineering or healthcare application. The course covers the following

syllabus: Introduction to Computers and Programming, problem solving techniques (e.g. Pseudo code, behavioural flowchart, structural block diagram), preprocessor directives, constants and variables, data types, input and output operations, text files, control structures: sequential, selection and loop, built-in and user-defined functions, one dimensional and multi- dimensional arrays, and pointers. This course covers hands-on tutorial to expose the students to some modern C/C++ Integrated Development Environment (IDE) and advanced microprocessor/microcontroller kits for embedded programming application development. This course also applies the concept of CDIO (Conceive-Design-Implement-Operate).

SEEU 2523 Electromagnetic Field Theory
This course presents several major collective understandings and theories within the area of electrostatic, magnetostatic and electromagnetic fields to the students. The abovementioned electromagnetic field theory is succinctly summarised via the Maxwell's equations. Here, the course is conducted with the assumption that the enrolled students are already equipped with the necessary mathematical foundations including multivariable calculus. Furthermore, they should also possess some familiarity with basic concepts covered in the typical introductory circuit theory course such as resistance, capacitance and inductance to list a few.

SEEU 3133 System Modelling and Analysis
This course introduces the students to the fundamental ideas and definitions of control systems, open loop and close loop control systems, process of control system design and representation. Students will be taught how to obtain mathematical models of actual physical systems such as electrical, mechanical and electromechanical systems in transfer function (frequency domain) and state space equations (time domain). Methods of system representation such as block diagram representation and signal flow graphs will be examined. The students will be exposed to technique of analysing control systems performance and stability in time domain. Finally, to simulate the stability and performance of the systems using software tools.

SEEU 3063 Electronic Circuits and System
This course introduces students to theories in amplifiers and its applications. It will examine some key issues in the construction of analogue amplifiers, operational amplifiers and analogue system with special focus on analysis of transistor amplifiers through small signal equivalent circuits. This course also covers some topics in functional electronic circuits. The circuits are derived from a diverse electronic circuitry existed in many electronic instrumentation. The course will also provide practice in carrying out a computer simulation and modeling of the amplifier's circuits using MultiSim software. The function, the behaviour and the characteristics of the functional circuits are analysed.

SEEU 3533 Communication Principles
This course introduces the students the basic principles of communication system. The fundamental concepts of analogue modulation in particular amplitude and frequency modulations will be strongly emphasized. Topics include types of modulated waveforms, transmitter and receiver structures, and noise performance. The two most significant limitations on the performance of a communications system; bandwidth and noise will be discussed. The concept of sampling, quantization, and line coding techniques in rendering an information

signal to be compatible with a digital system are explained prior to the study of coded pulse modulation and pulse code modulation (PCM). The waveforms and spectral analysis of band-pass digital modulations are introduced. The system performance in terms of SNR and bit error rate (BER) will also be covered. Finally, multiplexing (e.g., time-division and frequency-division multiplexing), a method to utilize the communication resource efficiently is studied. At the end of the course student should be able to explain, evaluate and solve problems related to communication systems (modulation and multiplexing).

SEBB 3033 Microprocessor System
This course introduces the principles and applications of microprocessors. Topics emphasized are embedded microprocessor architecture and organization in detail incorporation with High Level Language (HLL), as well as fundamentals of designing and interfacing in a microprocessor-based embedded systems. This course emphasizes on understanding the fundamentals of microprocessor operation, writing coherent and error-free HLL programs, and designing basic interfacing circuits for microprocessor-based embedded systems which targeted for biomedical or health care application using HLL completely with confidence.

SEBB 2712 Laboratory 1
The course includes the experiments on basic electrical, electronic, signal processing, technical drawing and programming that are related to biomedical engineering. It exposes the students to some common electrical and electronic components, circuits and theorem such as Thevenin and Norton theorem, RLC circuits and MSI circuits. On the other hand, this teaching laboratory also provides the skill of programming for embedded system, digital signal processing in Matlab and 3D drawing.

SEBB 3712 Laboratory 2
The purpose of this course is to provide the students with practical experience in using laboratory electrical instruments and equipments, analyse experimental results, read component's data sheets, and develop report-writing skills. A total of 7 experiments are conducted for third year laboratories such as Basic Electronic, Instrumentation, Microcontroller, Biomaterial and Biomechanics. The students should be able to improve their communication skills and team-working environment.

SEBB 3722 Laboratory 3
The course provides students with the opportunity to integrate technical knowledge and generic skills attained in the earlier years. This is to be achieved within the context of a medical engineering project conducted in a small team (typically seven students) under the supervision of an academic staff. Topics supplementing this course include Bioinstrumentation, Solid mechanics, Biomechanics and Biomaterial, Medical Imaging, Biomedical Signal Processing and Clinical engineering. The laboratory is conducted based on Conceive-Design-Implement-Operate (CDIO) in which students are required to solve real and complex engineering problem by collecting information and feedback from the end user, design suitable experimental procedures for their innovations, present their innovations and finally submit the report.

SEBB 4712 Laboratory 4
4th Year Laboratory (SEBB 4712) is a required course for fourth year students in Bachelor of Engineering (Biomedical) degree program. This course involves experiments in many different areas of biomedical engineering such as Bioinstrumentation, Biomechanics and Biomaterials, Medical Imaging, Biomedical Signal processing and Clinical Engineering. This laboratory session in conducted as Problem-Based Learning (PBL) approach. The students are grouped into 4-5 students/group and they will be given problems to solve that require them to do pre-labs and conduct experiments within 6 weeks. The students are required to solve the given problems as a team, design suitable experimental procedures, conduct the experiments, present the problem solutions and submit a full formatted report.

SSCE 1693 Engineering Mathematics 1
This course is about multivariable calculus of real and vector-valued functions. The basic theory of partial derivatives and multiple integrals of real functions with their applications 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 in detail.

SSCE 1793 Differential Equations
This is an introductory course on differential equations. Topics include first order ordinary differential equations (ODEs), linear second order ODEs with constant coefficients, the Laplace transform and its inverse, Fourier series, and partial differential equations (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 linear second order PDEs.

SSCE 1993 Engineering Mathematics 2
This course is about multivariable calculus of real and vector-valued functions. The basic theory of partial derivatives and multiple integrals of real functions with their applications 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 in detail.

SSCE 2193 Engineering Statistics
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 also introduced to some nonparametric methods in analysing data.

SSCE 2393 Numerical Methods
This course discuss problem solving using numerical methods that involve non-linear equations, systems of linear equation, interpolation and curve fitting, numerical differentiation and numerical integration, Eigen value problems, ordinary differential equations and partial differential equations.

SEBB 1513 Basic Anatomy and Physiology
This course is the first of two sequence courses studying the anatomical terminology, body's structures orientation and physiological event of human body systems. This course includes the study of several body systems. The gross anatomical features of the body systems are presented with relevant emphasis on the structural and functional interrelationships. In conjunction with classroom instructions, the anatomy and physiology tutorial component requires students to apply knowledge from the classroom to laboratory models, experiments and critical thinking application exercises. The content of the lectures is adapted to engineers; an emphasis is placed on medical terminology as a very important language for the technician or researcher involved in biotechnology, biomedical investigations, or clinical research.

SEBB 1012 Introduction to Biomedical Engineering
This is a course specially designed to introduce biomedical engineering and motivate students to understand the fields in biomedical engineering. This course also let the student to implement and operate a biomedical engineering project with some basic knowledge of planning, assembling, soldering and programming a biomedical electronics circuit. Some medical instruments will be discussed in this course. Lastly, this course will facilitate the students to plan their carrier path towards a biomedical engineer.

SEBB 1523 Advanced Anatomy And Physiology
This course will build on the previous knowledge given in the Basic Human Anatomy and Physiology with an emphasis on how each system plays a vital role in homeostasis. Each of the major body systems will be covered in detail as well as their relevance in the maintenance of the human body as a unit. Applied experiences will include the common areas that have relation to biomedical course. It will not be as details as in the medical courses, rather than, it will cover the most interesting areas that the biomedical research focus in the current era. The course is designed to prepare students for work in the biomedical fields or research. The course is planned to give a conceptual and some practical insight to the human body and its normal function and to the some of the abnormalities might disturbs the body homeostasis.

SEBB 1313 Statics and Dynamics
Statics and dynamics are two fundamental and important subjects to equip undergraduates with the necessary tools to solve biomechanics related problems. This course covers the concepts and principles related to the physical behaviour of materials under static loads and during motion. Emphasis is placed on the importance of satisfying equilibrium, analysing structure, solving resultant of forces, kinematics and kinetics of rigid bodies. This course will emphasize team working and problem solving through group project.

SEBB 2513 Basic Rehabilitation
The course aims to introduce students to basic rehabilitation principles that can be applied within the context of rehabilitation engineering. A principle direction of this course is to equip students with the basic knowledge about some of the most common impairments and the most common medical conditions, disease, injuries, or disorders causing impairment and disability and correlating concepts with clinical scenarios. The course will provide knowledge on the impairment aetiologies, assessment and evaluation procedure, disability rating, functional limitations, and rehabilitation potential. Furthermore, knowledge will be provided about the technology and engineering applications for individuals with impairment and technical solutions for these problems. It will also provide students with skills that are required for effective team-working and effective communication for optimal interdisciplinary care of the disabled person.

SEBB 3313 Biomedical Materials
This course provides an introduction to the fundamentals of and recent advances in biomedical materials. It covers a broad spectrum of biomedical materials which include metals, ceramics, polymers and composites. It takes an interdisciplinary approach to describing the chemistry and physics of materials, their biocompatibility, and the consequences of implantation of devices made of these materials into the human body. The course is also designed to familiarise students with failure of materials through fracture, fatigue, wear and corrosion.

SEBB 3323 Solid Mechanics
The course provides students with the knowledge to determine the strength and stiffness of structures being used. The structures that will be studied in this course are bars, pins, bolts, shafts and beams and the types of applied loading are axial forces, deformations due to the change in temperature, torsional loads, transverse loads and combination of these loads. At the end of the course, students should be able to determine the mechanical properties of the materials with respect to their strength and stiffness. Students should be able to calculate stresses, strains and deformations in structures due to various types of loading conditions. The students should also be able to use the acquired knowledge to solve real problems either coming from research problems, or from real-world biomedical problems.

SEBB 3023 Biomedical Imaging
A course is for introducing and exposing students to the world of medical tomography. It focuses on physical, operation and signal formation of medical tomography techniques from various imaging modalities such as MRI, ultrasound, CT-scan, nuclear medicine and X-ray.

SEBB 3423 Clinical Engineering
This course introduces students to major principles of clinical engineering as part of the preparation for industrial training. The scope of clinical engineering covers pre-market, market and post-market life-cycle of medical devices as well as risk and personnel management. These include procurement planning, incident investigation, equipment management, productivity, cost effectiveness, information systems integration, and patient safety activities. Students will also be exposed to the related law, standard and regulation for medical devices. Other than that, principle of medical devices will also be discussed in the course

SEBB 3043 Instrumentation and Measurement In Biomedical
This course introduces students to biomedical measurement systems and biomedical instrumentation design. The architecture of electronic instruments used to measure physiological parameters is addressed, as well as the analysis of major process functions integrated in these instruments.

SEBB 4915 Industrial Training (HW)
Industrial Training Programme is a compulsory component of the undergraduate curriculum at the Faculty of Biomedical & Health Science Engineering. Placements at the participating industries are structured for undergraduates in the third semester of their third year study. The industries where the students will be attached to during their training is listed in the supporting document (LI-CL). These industries cover all areas in Biomedical Engineering such as biomedical instrumentation and signal processing, clinical science and engineering, therapy and rehabilitation and biomechanics and biomaterial. The nature of jobs involved in the training includes designing, manufacturing, testing, maintaining, fabricating and etc.

SEBB 4812 Project Part I
The aim of the Final Year Project (FYP) is to give students opportunity to apply the knowledge that they have gained while studying in FKBSK to solve practical engineering problems. By doing so, it is hoped that the students will gain knowledge and experience in solving problems systematically thus when they graduate, they will be ready to work as reliable and productive engineers.

SEBB 4824 Project Part II
This course is a continuation from SEBB 4812.Students must submit a project thesis and present it at the end of the semester. Grades will be given for both.

Elective Courses

SEBB 4043 Biomedical Image Processing
This course introduces students to introductory and intermediate levels of image processing techniques. The area of coverage would be the digitization process as a mean to acquire the digital image. Next would be the enhancement and restoration processes which are to improve the quality of the image for next stage processing. Both the spatial domain and frequency domain approaches will be covered. The next stage would be the segmentation process. This is an important step towards advanced level processing. Finally, the topic of compression and coding will be covered. MATLAB will be used extensively for better understanding. By adapting this knowledge, students will be able to develop essential technical skills in solving biomedical image problems with some degree of accuracy. It focuses on medical image processing of image obtained from the various imaging modalities such as MRI, ultrasound, CT-scan, nuclear medicine and X-ray.

SEBB 4053 Biosystem Modelling
The objective of this course is to introduce students to the mathematical model, methods and their biological application, and model of subsystem in human body. This course introduces students to some major views and theories in modeling the subsystem in human body. It is almost impossible to cover all subsystems in human body. As guidance, topics may include: the maintenance of cell

homeostasis, excitation and conduction in nerve fibers, synaptic transmission and the neuromuscular junction, properties of muscles, the lung - physical and mechanical aspects of respiration, volume and composition of body fluids - the kidney, the cardiovascular systems, the heart as a pump, neural control of the heart and circulation, and the autonomic nervous system. The course will also provide practice in carrying out a computer simulation and modeling of bio system using Matlab/Simulink/LabView software.

SEBB 4063 Advanced Biomedical Signal Processing
This course presents two fundamental concepts of signal processing: linear systems and stochastic processes. Various estimation, detection and filtering methods are taught and demonstrated on biomedical signals. All methods will be developed to answer concrete question on specific biomedical signal such as ECG, EEG and etCO2. The focus of the course is a series of labs that provide practical experience in processing biomedical data, with examples from cardiology, neurology, respiratory and speech processing.

SEBB 4073 Biosensors and Transducers
This course is intended to introduce the function of biosensor and a transducer in the medical electronics industry. An overview of biosensors and an in-depth and quantitative view of device design including fabrication technique. Discussion of the current state of the art biosensor to enable continuation into advanced biosensor design and fabrication. Topics emphasize biomedical, bio-processing, military, environmental, food safety, and bio-security applications.

SEBB 4083 Artificial Intelligence
This course introduces students to the fundamentals of two techniques of artificial intelligence (AI), namely, fuzzy logic and neural networks. Both techniques have been successfully applied by many industries in consumer products and industrial systems. Fuzzy logic offers flexibility in developing rule-based systems using natural language type of rules. Neural networks on the other hand, have strong generalization and discriminant properties and offer a simple way of developing system models and function approximation. They are highly applicable for many pattern recognition applications. This course gives the students appropriate knowledge and skills to develop, design and analyze effectively these two AI techniques for practical problems with some degree of accuracy. The students will also be given a hands-on programming experience in developing fuzzy logic and neural networks system to effectively solve real world problems.

SEBB 4323 Biomedical Devices
A biomedical device is a product which is used for medical purposes in patients, in diagnosis, therapy or surgery. It includes a wide range of products varying in complexity and application and sometimes categorized into either passive or active devices. Examples include tongue depressors, medical thermometers, blood sugar meters, total artificial hearts, joint replacement devices, fibrin scaffolds, stents and X-ray machines. The global market of biomedical devices reached roughly 209 billion US Dollar in 2006 and is expected to grow with an average annual rate of 6 - 9% through 2010. Due to its importance, this course will introduce to students some of the many types of devices that are currently being used in the medical field.

SEBB 4333 Biological Inspired Devices
The course provides students with an overview of non-conventional engineering approaches is biology, and to show how these approaches can be used to design and develop better (simpler, more robust, energy-efficient) solutions, especially in the development of novel biomedical devices. The focus of the course will be mainly on the physical part (i.e. the structure and function) of organisms or parts of the organism, rather than the signal processing part. The students will practice on implementing bio-inspired mechanism in solving engineering problems.

SEBB 4343 Cell and Tissue Engineering
Tissue engineering integrates principles of engineering and life sciences towards the fundamental understanding of structure-function relationships in normal and pathological tissues. The course will cover the introduction and fundamentals of tissue engineering, extracellular matrix, cells, biomaterials in tissue engineering, scaffold in tissue engineering, in vitro and in vivo strategies, clinical applications of tissue engineering and ethical and regulatory issues in tissue engineering.

SEBB 4423 Biomedical Informatics
The course provides the student with the basic theoretical knowledge and practical experience from the area of medical informatics and radiobiology. The medical informatics knowledge covers area of processing of medical data, fundamentals of medical information system design, computer-aided medical diagnostics, and telemedicine. The radiobiology covers the physics of radiation, application of radiation in diagnostic and therapeutic, and radiation safety.

SEBB 4513 Rehabilitation Engineering
This course will focus on the principles and application of rehabilitation sciences & assistive technology from the rehabilitation engineering perspective. It aims to provide the students with in-depth understanding pertaining important issues in rehabilitation engineering and equip students with knowledge and skills for the application of science, technology and engineering to the design and development of assistive (adaptive) technology and rehabilitation systems. It will also provide students with an understanding of the nature of problems confronting people with disabilities and an ability to provide technical solutions for these problems. Interdisciplinary interaction and team working for optimal disability management will be stressed, with emphasis being given to the role of the rehabilitation engineering professional in the team.

SEBB 4433 Biomedical Instrumentation Management
Healthcare technology management provide an overview of systematic process in which qualified health care professionals, typically clinical engineers, in partnership with other healthcare leaders, plan for and manage health technology assets to achieve the highest quality care at the best cost. It explains the basic concepts of managed care and describes the various types of health plan in operation today. This course will cover the strategic planning as well as technology assessment and facilities planning proceed with technology procurement and conclude with service or maintenance management.

SEBB 4113 Bio-Fabrication
This subject provides the importance of additive manufacturing and its role in prototyping, development, transplant, implant and innovation of biomedical products. Different process technologies for additive manufacturing and bioprinting devices, systems, capabilities, materials and applications will be covered. It takes an interdisciplinary approach to describing the chemistry and physics of devices, materials, their compatibility, and the applications of additive manufacturing and machining of advanced materials in a wide range of applications of biomedical products.

SEBB 4123 Bio-Material Characterization and Analysis
This course is intended to expose the students with the most important characterization instruments to analyze the physico-chemical properties of a biomaterial. A range of advanced techniques for the materials characterization analysis, including materials composition, surface morphological, thermal, spectroscopy and chromatography analyses are introduced by discussing the basic underlying principle and the analysis procedures. Several case studies and recording data are evaluated and analyzed to improve the student's understanding in selecting types of characterization instruments in analyzing a biomaterial. Depending on the availability and functionality of instruments, lab visits and demonstrations will be scheduled following the class.

SEBB 4133 Machining and Testing for Biomedical Engineer
This course is designed for students to learn and experience the process of machining, testing and advance analysis. This course will be focusing on selected biomedical related parts and carry out course learning using conventional and advanced manufacturing techniques such as using 3D printed machine, and Computer Numerical Control (CNC) machining techniques. Once parts are manufactured, mechanical testing will be carried out using conventional and advanced method employing Universal Testing Machine (UTM) to determine mechanical properties of parts. Further analysis will also be done to corroborate findings with theoretical foundation of material.

SEBB 4153 Electronic CAD Digital System Design
This course presents design methods to construct digital systems, including combinational circuit and sequential circuit. Topics include: (1) Computer-Aided Design (CAD) tools for design, (2) Hardware Description Languages (HDL) for simulation and synthesis, and (3) state machine specification, design, and simulation. In this course, some of the important features of HDL will be examined. The course will enable students to design, simulate, model and analyze digital designs. The dataflow, structural, and behavioral modeling techniques will be discussed and related to how they are used to design combinational and sequential circuits. The use of test benches to exercise and verify the correctness of hardware models will also be described. Practical experience is gained by implementing various designs on a prototype FPGA board.

SEBB 4163 Advance Computer Programming and Data Structure
This course discusses programming problems, why they are problems, and the approach C++ has taken to solve such problems using object-oriented programming approach (OOP). From this course, the students will be equipped with skills of advanced C++ programming language to solve moderate to advanced problems that related with biomedical engineering or healthcare application using OOP approach. It will also cover some basic data structure such as list structure and tree structure. The course covers the following syllabus: Introduction to objects, fast recap of C language syntax, data abstraction, class and object implementation, object initialization and cleanup, function and operator overloading, constants, inline functions, inline functions, name controls, etc. This course covers hands-on tutorial to expose the students to some modern C++ Integrated Development Environment (IDE) for biomedical and healthcare application development. This course also applies the group design project. The students will be divided in groups to propose a group project to solve complex problems that related with biomedical engineering or healthcare application. Before attending this course, the students should have prior knowledge in C programming language, number representation (binary, octal, hexadecimal, decimal), signed/unsigned number arithmetic (1's compliment and 2's compliment), and simple logic functions (AND, OR, XOR, NOT, etc).

SEBB 5003 Biomedical Measurement Technique
This course provides the students a complete exposure of various recording mechanism and biomedical parameters measured for diagnostic application. Also introduces students to design biomedical measurement systems and biomedical instrumentation. The architecture of electronic instruments used to measure physiological parameters is addressed, as well as the analysis of major process functions integrated in these instruments.

SEBB 5013 Diagnostic and Therapeutic Technology
This course is designed to introduce students to Diagnostic and Therapeutic Technology and their respective details on the broad collection of various related equipment. At the end of the course, students are able to describe the diagnostic methods and therapeutic technologies used in growing healthcare fields and be able to design a simple diagnostic/ therapeutic method which can be used in healthcare environment, clinical and research.

SEBB 5023 Advanced Biomedical Engineering
This course provides the students with the introduction to advanced technologies of biomedical engineering in the field of bioinstrumentation, biophysics, biomaterials and biomechanics. The impact of technologies on clinical research, rehabilitation engineering, and patient care will be dealt along with professional ethics. The course explores techniques for assessing current information practices, determining the information needs of health care providers and patients, developing interventions using biomedical technology, and evaluating the impact of those interventions.

SEBB 5033 Medical Informatics
This course introduces and exposes the students to the organization of biomedical informatics, in terms of fundamentals and applications of biomedical informatics in healthcare. It ranges from data acquisition, decision making, cognitive science, computing, system design, standards, and ethics, to Electronic Health Record (EHR), imaging, information management, data retrieval, Patient Care and Monitoring, and Bioinformatics. Basic theory and applications will be exposed through teaching and discussion. Practical work in medical informatics will be introduced as part of individual and group assignments.

SEBB 5043 Biomechanics
This course provides the students with application of the principles of mechanics and the engineering techniques to the human body. The series of lectures explore the musculoskeletal system and highlights selected applications in the area of orthopaedics (gait analysis, joint replacement) and analysing the various forms of human movement.

Bachelor of Science (Equine Management) with Honours

Programme Specifications

The equine industry in Malaysia has expanded into many fields of sport disciplines. It requires more experts with the knowledge of equine science, sports and management. Universiti Teknologi Malaysia (UTM) has appeared to be the first higher learning institution in Malaysia and South East Asia to offer a Bachelor of Science (Equine Management) with Honours program to fulfill the equine science and sports experts requirement in the country.

The curriculum structure in this program has considered the requirements and recommendations of the stakeholders, including the Malaysian Equine Council (MEM). The curriculum covers the theories and practices of the three major fields of equine science, equine management and equine sports. The students will be developed with communication skills, ethics, professionalism, leadership, and entrepreneurship related to the equine industry.

Classroom lectures, tutorials, hands-on field practicals, group discussions, and industrial training are the teaching and learning methods. Assessments are written and oral/practical tests, individual & group assignments with presentations, and final examinations at the end of the semesters.

General Information

1. Awarding Institution	Universiti Teknologi Malaysia
2. Teaching Institution	Universiti Teknologi Malaysia
3. Programme Name	Bachelor of Science (Equine Management) with Honours
4. Final Award	Bachelor of Science (Equine Management) with Honours
5. Programme Code	SEBQH-01
6. Professional or Statutory Body of Accreditation	Malaysian Qualification Agency
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 years Maximum: 6 years

Course Classification

No.	Classification	Credit Hours	Percentage
i.	University Courses a. General b. Language c. Co-Curriculum	12 8 3	17.8%
ii.	Programme Core Courses	70	54.2%
iii.	Programme Elective Courses	36	28.0%
	Total	**129**	**100%**
Total Credit Hours to Graduate		**129 credit hours**	

Programme Educational Objectives (PEO)

After having exposed to 3 to 5 years of working experience, our graduates should become professionals in the equine field who demonstrate the following competencies:

Code	Programmes Educational Objectives
PEO1	Competent and have strong basic knowledge and skills in equine science, sports and management.
PEO2	Highly skilled and competitive in solving local and global equine industry problems creatively and innovatively with technology applications.
PEO3	Able to communicate effectively and work in groups by exhibiting leadership traits.
PEO4	Demonstrate professionalism among the equine industry network through ongoing involvement in local community activities.

Programme Learning Outcomes (PLO)

Upon completion of the programme, graduates should be able to demonstrate the following competencies:

Code	Programme Learning Outcomes
PLO1	Demonstrate comprehensive skills in equine science and management with in-depth technical and theoretical knowledge.
PLO2	Demonstrate intellectual abilities in applying knowledge in equine science and management using critical and analytical skills.
PLO3	Application of basic methods and procedures to solve a variety of complex problems related to equine science and management.
PLO4	Demonstrate the ability to collaborate with other individuals from a variety of backgrounds and fields.
PLO5	Communicate effectively in presenting ideas in writing and orally using a variety of coherent and structured presentation methods appropriate to the context of the audience.
PLO6	Application of information, media and technology to carry out learning and tasks.
PLO7	Utilize and combine numerical data and graphs in learning.
PLO8	Demonstrate responsibility and high leadership qualities in achieving a goal.
PLO9	Self-improvement through continuous learning and effective professional development.
PLO10	Demonstrate entrepreneurial skills in implementing equine related projects.
PLO11	Demonstrate professionalism and adhere to ethics in completing given tasks.

Entry Requirements

For Malaysian Students

Applicants must fulfill both general and special entry requirements for the program.

GENERAL ENTRY REQUIREMENTS

STPM Holders
A pass in Malaysian Higher School Certificate (STPM) with at least C grade (CGPA 2.00) in General Paper and C grade (CGPA 2.00) in any two of the taken subjects in the STPM

OR

STAM Holders

A pass in STAM Qualification for at least Jayyid level

OR

MATRIC or ASASI Holders

A pass in Malaysian Matriculation Certificate / Foundation with minimum CGPA of 2.00

OR

A-LEVEL / IB / AUSMAT Holders

Hold A-Level / International Baccalaureate / Australian Matriculation (Ausmat) Certificate.

OR

DIPLOMA Holders

Hold Diploma / Equivalent recognized by Malaysian government and approved by the University Senate or a pass in Malaysian Higher School Certificate (STPM) with at least C Grade (CGPA 2.00) in General Paper and C Grade (CGPA 2.00) in any two of the taken subject in the STPM

OR

DIPLOMA VOCASIONAL Holders

Hold Diploma Vokasional recognized by Malaysian government and approved by the University Senate

AND

1. A pass with credit in Bahasa Melayu/ Bahasa Malaysia at SPM level, **and**
2. Attained a minimum Band 2 in Malaysian University English Test (MUET).

SPECIAL ENTRY REQUIREMENTS

1. Passed fitness test and interview conducted by the program and
2. Do not have any physical disabilities.

For International Students

Applicants must fulfill the entry requirements for the program.

GENERAL ENTRY REQUIREMENTS

1. A Senior High School Certificate/Senior Secondary School/other equivalent pre-university qualifications from government schools (with a period of at least 12 years of study from primary to higher secondary). Refer to *https://admission.utm.my/general-entry-requirement/* for further details.

2. Participate in the bridging program organized by the university, **and**

3. Attained a minimum Band 3 in Malaysian University English Test (MUET)/ Band 5.5 in IELTS/ Score of 46 in TOEFL iBT.

4. Pass the health fitness requirements and no physical disabilities.

Please refer to *admission.utm.my/entry-requirements-ug-international/* for further details.

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

Degree Conferment Requirements

Upon completion of the study, to be conferred with a Degree of Science (Equine Management) with Honours, the students must:

- Attained and at least passed a total of not less than 137 credit hours with a minimum CGPA of 2.0.
- Pass Industrial Training course
- Attended and completed successfully Professional Skill Certificate (PSC) consist of 3 compulsory courses and 2 elective courses as listed below:

  Compulsory courses:

  1. Talent and Competency Management - GLRB0010
  2. English Communication Skills Graduating Students (ECS) - GLRL0010
  3. Design Thinking for Entrepreneur - GLRM0010

  Elective courses (Any 2 courses):

  1. Data Analytics for Organisation - GLRT0010
  2. Professional Ethics and Integrity - GLRM0020
  3. Safety and Health Officer Introductory Course - GLRT0060

To pass these courses, students must:

- Attain passing grade which is D+ (40 marks and above); and attain 20% and above in final examination.
- Attain HL (Passing) grade in course registered with Pass-Fail status (HW).

Marking and Assessment

The Relationship Involving Marks, Grades and Point Values			
Marks	**Grade**	**Point**	**Result Status**
90 - 100	A+	4.00	**PASS**
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	**FAIL**
30 - 34	D-	0.67	
00 - 29	E	0.00	

Professional Skills Certificate (PSC)

Students must enroll in certificate programmes offered by the Centre of Excellence in the University and the School of Professional and Continuing Education (SPACE) as part of the award requirement:

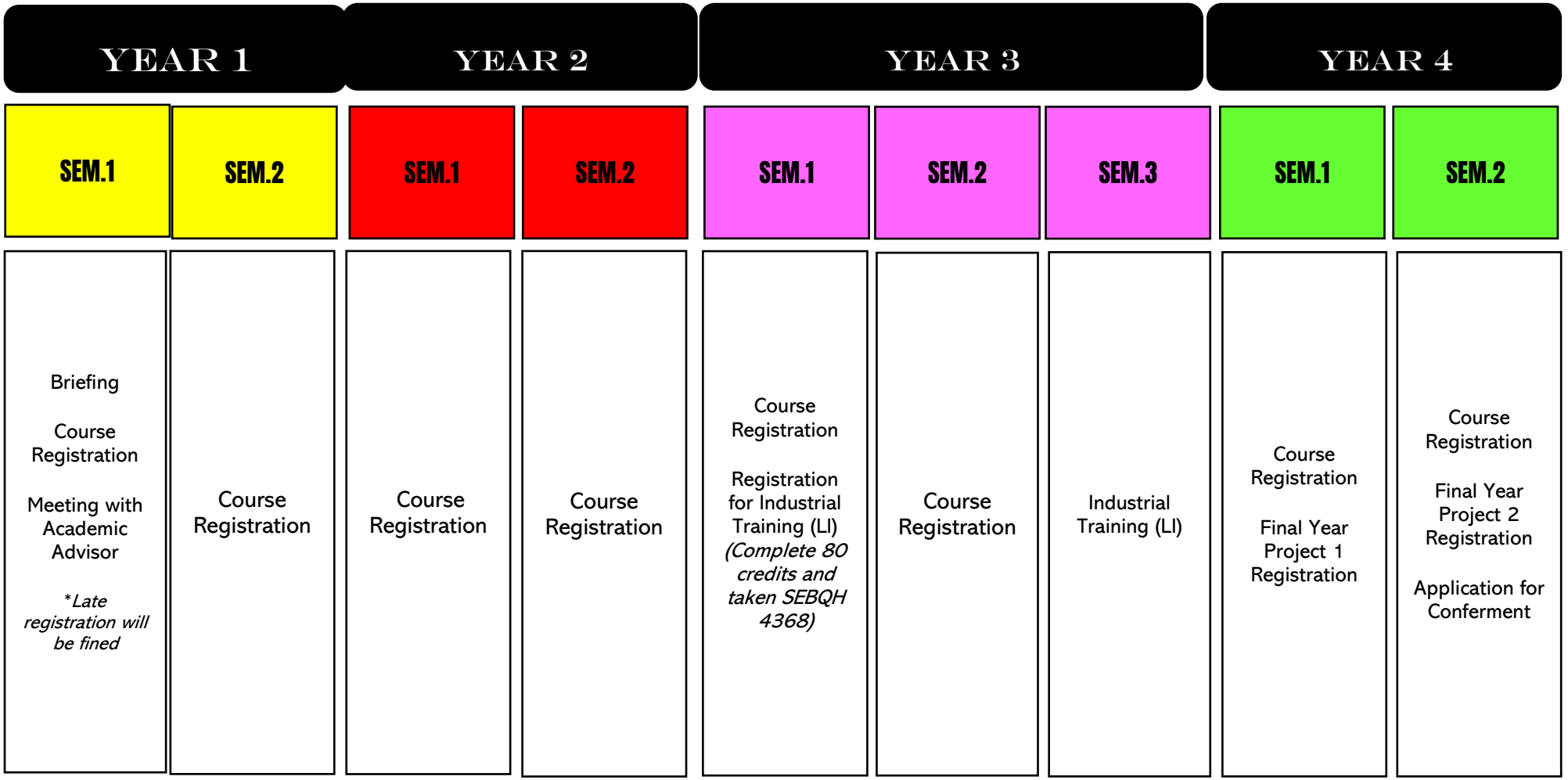
Compulsory courses:

1. Talent and Competency Management - GLRB0010
2. English Communication Skills Graduating Students (ECS) - GLRL0010
3. Design Thinking for Entrepreneur - GLRM0010

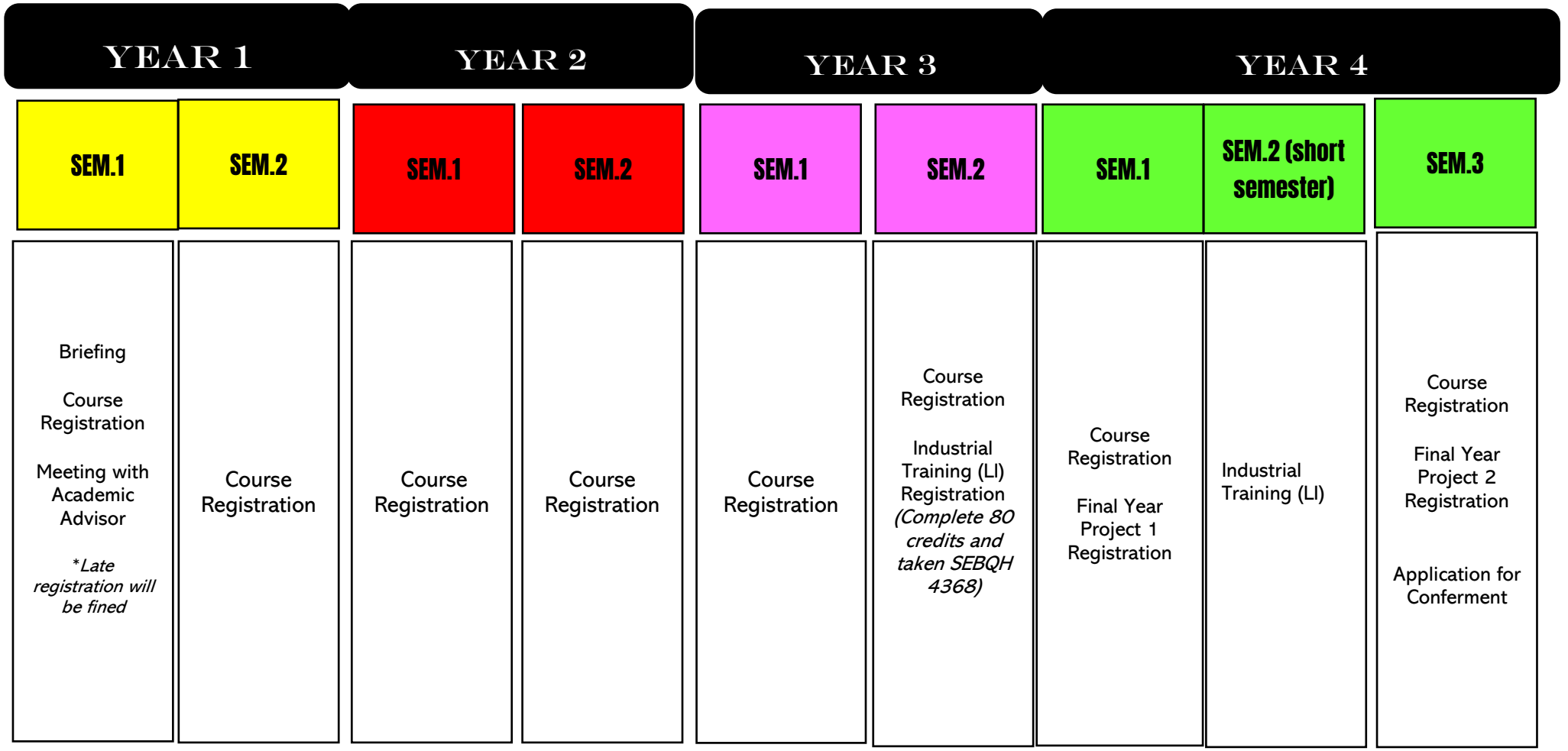
Elective courses (Any 2 courses):

1. Data Analytics for Organisation - GLRT0010
2. Professional Ethics and Integrity - GLRM0020
3. Safety and Health Officer Introductory Course - GLRT0060

Overall flow chart as SEBQH student (1st Intake – October)



Overall flowchart as SEBQH student (2nd Intake – March)



Course Menu –Intake 2021/2022 Semester 1

YEAR 1 (SEMESTER 1)			
Code	**Courses**	**Credit**	**Pre-req**
SEBQ 1013	Introduction to Equine Science and Industry	3	
SEBQ 1023	Introduction to Management	3	
SEBQ 1093	Basic Horse Handling	3	
SEBQ 1282	Practical Experience I: Basic Horse Handling	2	
UHAS 1172	Malaysian Dynamics (Local)	2	
ULA* 1112	Elective Foreign Language (Malaysian)	2	
ULAM 2112	Malay Language Communication (International)		
UHLB 1112	English Communication Skills	2	
TOTAL CREDIT HOURS		**17**	

YEAR 1 (SEMESTER 2)			
Code	**Courses**	**Credit**	**Pre-req**
SEBQ 1102	Sports Psychology	2	
SEBQ 1112	Foundation of Equine Performance	2	
SEBQ 1203	Equine Anatomy and Physiology	3	
SEBQ 1033	Farm and Stable Management	3	
SEBQ 1292	Practical Experience II: Basic Riding Skills	2	
UICI 1012	Islamic and Asian Civilization (TITAS) – Local	2	
UHAK 1022	Malaysian Studies (International)		
UHMT 1012	Graduate Success Attribute	2	
TOTAL CREDIT HOURS		**16**	

YEAR 2 (SEMESTER 1)			
Code	**Courses**	**Credit**	**Pre-req**
SEBQ 2122	Horse Riding I: Endurance	2	SEBQ 1292
SEBQ 2213	Basic Equine Healthcare Management	3	
SEBQ 2043	Commercial Equine Facilities Designs and Management	3	
SEBQ 2302	Practical Experience III : Managing Horse Healthcare	2	
UHLB 2122	Advanced Academic English Skills	2	
UKQ*2**2	Co-curriculum and Service Learning	2	
U***2**2	Innovation & Creativity Cluster (Choose 1 from several electives)	2	
TOTAL CREDIT HOURS		**16**	

YEAR 2 (SEMESTER 2)			
Code	**Courses**	**Credit**	**Pre-req**
SEBQ 2053	Equine Business Management	3	
SEBQ 2062	Principles of Risk Management	2	
SEBQ 2133	Horse Behaviors and Training	3	
SEBQ 2142	Horse Riding II: Dressage	2	
SEBQ 2223	Equine Disease Management	3	
SEBQ 2312	Practical Experience IV: Horse Husbandry Practices	2	
UHIT 2302	Sciences and Technology Thinking	2	
TOTAL CREDIT HOURS		**17**	

YEAR 3 (SEMESTER 1)			
Code	**Courses**	**Credit**	**Pre-req**
SEBQ 3243	Equine Nutrition	3	SEBQ 4482
SEBQ 3233	Equine Lameness and Conditioning	3	
SEBQ 3152	Horse Riding III: Jumping	2	
SEBQ 3302	Research Methodology	2	
SEBQ 3322	Practical Experience V: Riding for Disable (Volunteer Helper Level)	2	
UBBS 1032	Introduction to Entrepreneurship	2	
TOTAL CREDIT HOURS		**14**	

YEAR 3 (SEMESTER 2)			
Code	**Courses**	**Credit**	**Pre-req**
SEBQ 3073	Event and Competition Management	3	
SEBQ 3183	Equestrian Motion Analysis	3	
SEBQ 3263	Equine Biosecurity (Equine Quarantine)	3	
SEBQ 3332	Practical Experience VI: Riding for Disable (Senior Helper Level)	2	
UHLB 3132	Professional Communication Skills (pre-req UHLB 2122)	2	
TOTAL CREDIT HOURS		**13**	

SHORT SEMESTER			
Code	**Courses**	**Credit**	**Pre-req**
SEBQH 4368	Industrial Training	8	
TOTAL CREDIT HOURS		**8**	

YEAR 4 (SEMESTER 1)			
Code	**Courses**	**Credit**	**Pre-req**
SEBQ 4082	Equine Seminar	2	
SEBQ 4102	Undergraduate Project 1	2	
SEBQ 4163	Riding Instructor Training	3	
SEBQ 4173	Equine Evaluation and Selection	3	
SEBQ 4193	Equine for Disabled	3	
SEBQ 4342	Practical Experience at Equine Farm VII: Riding Instructor	2	
TOTAL CREDIT HOURS		**15**	

YEAR 4 (SEMESTER 2)			
Code	**Courses**	**Credit**	**Pre-req**
SEBQ 4253	Equine Therapy and Rehabilitation	3	
SEBQ 4273	Equine Reproduction and Breeding Technologies	3	
SEBQ 4352	Practical Experience VIII: Horsemanship	2	
SEBQ 4114	Undergraduate Project 2	4	
UKQE 3001	Extracurricular Experiential Learning (ExCEL)	1	
TOTAL CREDIT HOURS		**13**	

Total Credits Earned: 129

Elective Courses

Code	Courses	Credit	Pre-req
SEBQ 1023	Introduction to Management	3	
SEBQ 1102	Sport Psychology	2	
SEBQ 11122	Foundation of Equine Performance	2	
SEBQ 1292	Practical Experience at Equine Farm II – Advance Horse Handling	2	
SEBQ 3302	Research Methodology	2	
SEBQ 2053	Equine Business Management	3	
SEBQ 2062	Principle of Risk Management	2	
SEBQ 2223	Equine Disease Management	3	
SEBQ 2312	Practical Experience at Equine Farm IV – Horse Welfare, Hygiene & Podiatry.	2	
SEBQ 3073	Event and Competition Management	3	
SEBQ 4082	Equine Seminar	2	
SEBQ 4163	Riding Instructor Training	3	
SEBQ 4173	Equine Evaluation & Selection	3	
SEBQ 4342	Practical Experience at Equine Farm VII – Riding Instructor Training	2	

- All elective courses are compulsory.

Elective of Language Skills Courses

Code	Courses	Credit	Pre-req
UHLA 1112	Arabic Language	2	
UHLJ 1112	Japanese Language 1	2	
UHLC 1112	Mandarin Language 1	2	
UHLJ 1112	France Language	2	
UHLN 1112	Persian Language	2	

Graduation Checklist

Students must pass all courses in this checklist below. It is the responsibility of the students to ensure all courses are taken and passed. Students who do not complete any of the courses below will not be allowed to graduate.

No	Code	Course	Credit Earned (JKD)	Credit Counted (JKK)	Tick (√) If Passed
Core Courses					
1	SEBQ 1013	Introduction to Equine Science and Industry	3	3	
2	SEBQ 1023	Introduction to Management	3	3	
3	SEBQ 1093	Basic Horse Handling	3	3	
4	SEBQ 1282	Practical Experience 1: Basic Horse Handling	2	2	
5	UHAS 1172	Malaysian Dynamics (Local)	2	2	
6	ULA* 1112	Elective Foreign Language (Malaysian)	2	2	
7	ULAM 2112	Malay Language Communication (International)			
8	UHLB 1112	English Communication Skills	2	2	
9	SEBQ 1102	Sport Psychology	2	2	
10	SEBQ 1112	Foundation of Equine Performance	2	2	
11	SEBQ 1203	Equine Anatomy and Physiology	3	3	
12	SEBQ 1033	Farm and Stable Management	3	3	
13	SEBQ 1292	Practical Experience II: Basic Riding Skills	2	2	
14	UICI 1012	Islamic and Asian Civilization (TITAS)	2	2	
15	UHAK 1022	Malaysian Studies (international)			

16	UHMT 1012	Graduate Success Attribute	2	2	
17	SEBQ 2122	Horse Riding I: Endurance	2	2	
18	SEBQH 2213	Equine Healthcare Management	3	3	
19	SEBQ 2043	Commercial Equine Facilities Design and Management	3	3	
20	SEBQ 2302	Practical Experience at Equine Farm III : Managing Horse Healthcare	2	2	
21	UHLB 2122	Advanced Academic English Skills	2	2	
22	UKQ* 2**2	Co-curriculum and Service Learning	2	2	
23	U*** 2**2	Innovation & Creativity Cluster	2	2	
24	SEBQ 2053	Equine Business Management	3	3	
25	SEBQ 2062	Principles of Risk Management	2	2	
26	SEBQ 2133	Horse Behaviors and Training	3	3	
27	SEBQ 2142	Horse Riding II: Dressage	2	2	
28	SEBQ 2223	Equine Disease Management	3	3	
29	SEBQ 2312	Practical Experience IV: Horse Husbandry Practices	2	2	
30	UHIT 2302	Sciences and Technology Thinking	2	2	
31	SEBQ 3243	Equine Nutrition	3	3	
32	SEBQ 3233	Equine Lameness and Conditioning	3	3	
33	SEBQ 3152	Horse Riding III: Jumping	2	2	

34	SEBQ 3322	Practical Experience V: Riding for Disable (Volunteer Helper Level)	2	2	
35	UBBS 1032	Introduction to Entrepreneurship	2	2	
36	SEBQ 3073	Event and Competition Management	3	3	
37	SEBQ 3183	Equestrian Motion Analysis	3	3	
38	SEBQ 3263	Equine Biosecurity	3	3	
39	SEBQ 3332	Practical Experience VI: Riding for Disable (Senior Helper Level)	2	2	
40	SEBQ 3132	Professional Communication Skills (pre-req UHLB 2122)	2	2	
41	SEBQ 4168	Industrial Training	8	8	
42	SEBQ 4082	Equine Seminar	2	2	
43	SEBQ 4102	Undergraduate Project 1	2	2	
44	SEBQ 4163	Riding Instructor	3	3	
45	SEBQ 4173	Equine Evaluation and Selection	3	3	
46	SEBQ 4193	Equine for Disabled	3	3	
47	SEBQ 4342	Practical Experience VII: Riding Instructor	2	2	
48	SEBQ 4253	Equine Therapy and Rehabilitation	3	3	
49	SEBQ 4273	Equine Reproduction and Breeding Technologies	3	3	
50	SEBQ 4352	Practical Experience VIII: Horsemanship	2	2	
51	SEBQ 4114	Undergraduate Project 2	4	4	
52	UKQT 3001	Extracurricular Experiential Learning	1	1	

TOTAL CREDIT TO GRADUATE (a + b + c)			**129**	**129**	
Other Courses				
Professional Skills Certificate (PSC) (UTMSPACE/ School) Compulsory Courses				
1	GLRB 0010	Talent and Competency Management		
2	GLRL 0010	English Communication Skills Graduating Students (ECS)		
3	GLRM 0010	Design Thinking for Entrepreneur		
Elective Courses (2 course only)				
1	GLRT 0010	Data Analytics for Organisation		
2	GLRM 0020	Professional Ethics and Integrity		
3	GLRT 0060	Safety and Health Officer Introductory Course		

Course Synopsis

CORE COURSES

SEBQ 1013 Introduction to Equine Science and Industry

This course in general acts as an introduction to the student to get an overview of equine sports and industry. Students will learn the economic aspect of equine as well as the different entities that define the equine industries as a whole. Students will be able to evaluate and analyze the domestic equine industry in terms of its impact and economic performance.

SEBQ 1033 Farm and Stable Management

This course is a continuation from SEBQH 1093 (Basic Horse Handling – Part 1) where the student will be introduced to the fundamental knowledge and skills necessary for daily care and maintenance of the horse. Topics include horse conformation, horse stable design, grassland management, horse feeding & watering, rug & blankets, clipping & trimming, manure & pest management, risk assessment & management, lunging, specialist care of the competition horse, and transporting a horse

SEBQ 1093 Basic Horse Handling

This course is an introduction to the basic skills necessary for daily care and maintenance of the horse. Topics include safety, stall care, feeding, and basic nutrition, handling and restraint, equine emergencies and first aid, bandaging, basic medications, and trailer safety. Preventative health care, deworming and vaccination programs, and dental and farrier care are also introduced.

SEBQ 1203 Equine Anatomy & Physiology

This course aims to build the knowledge and understanding of the mechanisms of energy metabolism and means of monitoring performance. This module also aims to understand and clearly define the anatomical features of the horse and develop the ability to identify the anatomy of the musculoskeletal system. The student will develop the ability to identify anatomical features and relate their structure to function. An in-depth understanding of equine physiology is vital when training horses to a high level whilst minimizing the risk of injury.

SEBQ 1282 Practical Experience I: Basic Horse Handling

This course gives students the experience to apply the knowledge and skills necessary for basic horse handling such as the daily care and maintenance of the horse. Topics include the classification, identification, and confirmation of horses, activities related to the stable yard, grooming. In addition, this course also gave opportunities to students handling and leading the horses, etc.

SEBQ 2043 Commercial Equine Facilities Design and Management

This course focuses on the various types of constructional design of commercial equine facilities. The students will be applying the knowledge about the property layout, construction options, equipment, hay production, pasture management, water and waste management, zoning requirements, environmental impact, legal obligations, and liabilities of the facilities.

SEBQ 2122 Horse Riding 1 Endurance

The course focuses on the knowledge and development of basic skills in Endurance riding. Students will acquire knowledge and understanding which covers the aspect of the horse as well as the rider on the subject of Endurance riding. Students will develop the skills required to be able to conduct Endurance with a sound base of knowledge to reflect equine performance.

SEBQ 2133 Horse Behaviour and Training

This aims to equip the students with the knowledge of basic horse behaviour and the factors that influence and motivate horses for agility and during training. Students will learn the communication and social behaviour of horses and how stress and genetic factors implicate behavioural problems in horses.

SEBQ 2142 Horse Riding 2: Dressage

This course focuses on the knowledge and development of basic skills about Dressage (up to Novice level). Students will acquire knowledge and understanding which covers the aspect of the horse as well as the rider on the subject of Dressage (up to Novice level). Students will develop the skills required to be able to conduct Dressage with a sound base of knowledge to reflect equine performance (up to Novice level).

SEBQ 2213 Equine Healthcare Management

This course provides students with the knowledge of basic equine health care that covers the fundamental aspects and assessment of the physical condition of the horse, routine care, feeding and exercise. Students will learn the routine health care, disease prevention management practices on horses which will contribute to equine health fitness and welfare.

SEBQ 2302 Practical Experience III: Managing Horse Healthcare at Farm

This course aims to equip the students with the knowledge of basic equine healthcare that covers the fundamental aspects such as routine health examination, monitoring physical condition, schedule maintenance and care including feeding, welfare and exercise. Students will learn healthcare and routine preventive management practices on horses at farm. At the end of this course the students are able to conduct physical examinations on horses to determine the horse's health status and understand the need for good health management on horses at the farm.

SEBQ 3152 Horse Riding 3: Jumping

This course focuses on the development of knowledge and basic skills about Show Jumping horse riding. Students will acquire knowledge and understanding which covers the aspect of the horse as well as the rider on the subject of the Show Jumping event. Students will develop the skills required to be able to conduct a Show Jumping event based on knowledge acquired which includes the preparation of obstacles, course design, and judging points. This course in general acts as an introduction to the student to get an overview of the equestrian discipline of Show Jumping.

SEBQ 3183 Equestrian Motion Analysis

This course is to develop students' understanding of biomechanical factors influencing the athletic horse. The specific aims are to understand the relationship between equine anatomy, movement, and performance; and to develop understanding and practical skills in the methodologies for measuring biomechanical parameters. Students also will be able to analyze to evaluate equine performance within biomechanical parameters.

SEBQ 3233 Equine Lameness and Conditioning

This course aims to expose the students with the principles of the evaluation and interpretation of lameness disorders of the fore-and hind limbs of horses at farm. The students will be taught on how to access the grade of lameness on the field. Understanding the predispose factors to the common lameness will be discuss other than a basic method of cleaning wound of injuries for lameness treatment in this course.

SEBQ 3243 Equine Nutrition

The course aims are to build on knowledge gained within the horse management, to understand equine digestive anatomy and physiology and feeding management practice for maintenance, breeding, growth, performance and health. To develop knowledge of nutritional requirements in a wide variety of horses, feed evaluation and diet composition, to be able to formulate ration for horses based on the requirements and the environmental management of arable crops.

SEBQ 3263 Equine Biosecurity

This course provides an understanding of the importance of biosecurity in effectively preventing and controlling the spread of disease at the horse premises. This course also aims to equip the student with the knowledge of equine quarantine for disease control at a farm and legal requirements on horse importation in Malaysia. The topics will cover the scope of biosecurity management at farms and facilities which contribute to equine healthcare and welfare.

SEBQ 3322 Practical Experience V : Riding for Disabled (Volunteer Helper)

This course opens the opportunity for students to experience practical training in horseback therapy for the disabled. Students will practice the knowledge acquired in real-life situations and at the same time attain skills to handle and manage as volunteer helpers for the disabled during riding sessions. End of this subject students can get the Volunteer helper certification from RDA Malaysia.

SEBQ 4102 Undergraduate Project 1

The aim of the Undergraduate Project 1 is to allow students to apply the knowledge they have gained to solve practical equine-related problems. In the project, students will gain knowledge and experience in solving equine-related problems systematically to be ready for a working environment. The student will develop the project proposal. This course will progress to SMBU 4114.Students must prepare a proposal and present it in a mini seminar at the end of the semester.

SEBQ 4114 Undergraduate Project 2

The Undergraduate Project aims to allow students to apply the knowledge they have gained while undergoing this program to solve practical equine-related problems. Students will gain knowledge and experience in solving complex equine-related problems systematically to be ready for the working environment. This course is a continuation of SMBU 4102. Students must submit a hardbound thesis and present their project in a mini seminar at the end of the semester.

SEBQ 4193 Equine for Disabled

This course aims to provide a student with the knowledge, concepts, principles, and theories involved in equine for the disabled. Several common disabilities can benefit from equine treatment such as Cerebral Palsy, Down syndrome, Brain Injury, Seizure Disorders, Autism, Autistic Spectrum Disorders, learning disabilities. Students will be exposed to practice the knowledge learned in real-life situations handling those with disabilities (RDA) in the activities.

SEBQ 4253 Equine Therapy and Rehabilitation

This course provides an understanding of alternative therapy for rehabilitation of musculoskeletal injury commonly experienced by working horses in the field. The therapeutic methods discussed in this subject are those non-veterinary medicine approaches and can be practiced by the therapist. The scope of this course covers the therapeutic and rehabilitation techniques currently practiced in the market.

SEBQ 4273 Equine Reproduction and Breeding Technologies

The course aims to develop the understanding of reproduction functional physiology in horses. The student shall be able to identify oestrus behavior among mares and stallions and stages of pregnancy in mares. The student will be exposed to the principles of breeding management and care for the pregnant mares and stud stallions.

SEBQ 4352 Practical Experience VIII: Horsemanship

This course provides opportunities for students to experience practical training in equine farms or stable management. Students have the opportunity to practice the knowledge they have learned in real-life situations and at the same time learn more about the knowledge, skills, management of the farm, and the stable. In addition to providing a record of daily work in the industry, at the end of the course, students should prepare a written report and reflect on the industries that have been implemented

SEBQ 4368 Industrial Training

The course is open to opportunities for students to experience practical training in any institution or industry related to the field of equine. Students have the opportunity to practice the knowledge they have learned in real-life situations and at the same time learn more about the knowledge, skills, management, and technology of the industry. In addition to providing a record of daily work in the industry, at the end of the course, students should prepare a written report and reflect on the training industries that have been implemented.

ELECTIVE COURSES

SEBQ 1023 Introduction to Management

The aim of this course is to provide a general introduction in management to students whose field of study is not management, but whose careers are likely to have a significant managerial component. Students will be able to understand the concepts and language of management and to be aware of the relationships among all management disciplines. This course aims to provide you with an overview of the role of management thereby giving you an appreciation of the key issues associated with achieving purposeful activity within organizations.

SEBQ 1102 Sport Psychology

This course aims to prepare students with the knowledge in sports psychology in relation to the equine industry. This course exposes the students on how psychological factors affect performance and how participation in equine sports and exercise affect psychological and physical factors. In addition, students are also able to discuss the instruction and training of psychological skills for performance improvement when applied or working with athletes, coaches, and parents regarding injury, rehabilitation, communication, team building, and career transitions.

SEBQ 1112 Foundation of Equine Performance

The aim of this course is to further previous knowledge gained in other courses and recognize the qualities needed in a competition horse. This course also aims to develop an understanding on the foundation of equine performance in order to produce and sustain performance horses at a competitive level

SEBQ 1292 Practical Experience at Equine Farm II – Advance Horse Handling

This course gives students to experience and apply the knowledge and skills necessary for daily care and maintenance of the horse. Topics include horse conformation, horse stable design, grassland management, horse feeding & watering, rug & blankets, clipping & trimming, manure & pest management, risk assessment & management, lunging, specialist care of the competition horse and transporting a horse.

SEBQ 2053 Equine Business Management

This course aims to address the types of organization that require commercial managers within the Equine sector and the responsibilities that are fundamental to the role of a commercial manager. The course addresses the complexity of the equine market and the influence this will have on the strategic aims of a business or the entry to market of new business. The course also addresses the relevance of sustainability within a commercial context.

SEBQ 2062 Principle of Risk Management

This course aims to prepare students the knowledge in risk management for equine industry. This course exposes the students with the principles of risk management, risk management strategies, identifying the risks, assessing the risks, and managing the risk that will occur in various parties such as riders, staffs, horse, equipment, facilities and managing the incidents. Students are also able to discuss about the issues related to managing the risk in equine industry.

SEBQ 2223 Equine Diseases Management

This course aims to equip the student with the knowledge of equine diseases and the health management of horses. Students will be more knowledgeable and proficient at recognizing and managing some of the major health problems associated with equines. The emphasis of this course will be on preventive maintenance and necessary managerial practices needed to keep the equine health and welfare.

SEBQ 2312 Practical Experience IV: Horse Husbandry Practices

The course aims to equip the students with the knowledge of basic horse husbandry management at farm that covers the fundamental aspects of good farm management practice, welfare, routine horse dental care, feeding, exercise and farriery. Upon completion of this course the students will be able to understand and perform good horse husbandry practices.

SEBQ 3302 Research Methodology

This course introduces undergraduate students in education as an informal training in handling research. Basically, this course describes the nature of educational research and also introduces the steps in the research process. Relevant topics in this course include identification of research problems, ethical issues in conducting a research, the definition of research and importance of research in the field of education. This course also covers important characteristics of research mainly the research problems, questions and objectives, hypothesis testing and implementing a research, literature review, research design, sampling methods, research instruments (qualitative and quantitative), collecting and data administration, data analysis (qualitative and quantitative) including descriptive and inferential statistics. This course also provides students with necessary information and suggestions on how to put a research report together in a correct and efficient manner.

SEBQ 3073 Event and Competition Management

The main aim of this course is to enable students to acquire general knowledge about event and competition management and to become familiar with management techniques and strategies required for the successful planning, promotion, implementation, and evaluation of special events with a special focus on case studies of equine-related events. This course requires students to organize an event (of no specific nature) as well as a competition since students must be given hands-on experience of organizing an event firsthand.

SEBQ 3332 Practical Experience VI : Riding for Disabled (Senior Helper)

This course is to develop skills among the students on practical training in horseback therapy for the disabled. Students have the opportunity to practice the knowledge gained in real-life situations while acquiring the skills to handle and manage the therapy as senior helpers for the disabled during riding sessions. End of this subject students can get the senior helper certification from RDA Malaysia

SEBQ 4082 Equine Seminar

This course will equip students with the knowledge and skills to write articles related to organizing seminars on current issues in the field of equine science and equine management. The course contents cover the aspects of producing writing seminar papers or academic articles, poster presentation, present papers and discuss current issues in the field of equine in Malaysia and internationally.

SEBQ 4163 Riding Instructor Training

This course is designed to aid the students who wish to take an instructional role in the industry. Students will gain knowledge on the coaching perspective, how to organize, conduct, demonstrate and evaluate the performance of the rider and the horse. Students will be able to do an assessment and provide solutions during their class lessons.

SEBQ 4173 Equine Evaluation and Selection

This course aims to provide students with knowledge from the functional aspect of performance and anatomy, breed standards in the equine industry, components of judging various breeds, judging various disciplines. It also provides an ability for students to assessing equines market value such as understanding the market value, factors drives a horse’s price, various horse price-ranges, better purchase decision

SEBQ 4342 Practical Experience VII : Riding Instructor Training

This course will assist the students who wish to take an instructional/coaching role in the equine industry. Students will gain knowledge on the coaching perspective in terms of how to organize, conduct, demonstrate and evaluate the performance of the rider.

SKBSK Undergraduate Handbook 2021/2022
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Correction Notes:

Revised Version 2
Correction on the semester header for SEBB Course Menu (March Intake)

School of Biomedical Engineering and Health Sciences
FACULTY OF ENGINEERING
UNIVERSITI TEKNOLOGI MALAYSIA

TEL : +6(07) - 5558400
FAX : +6(07) - 5558515
https://engineering.utm.my/biomedical/