UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Faculty of
Electrical Engineering

BACHELOR OF ELECTRICAL ENGINEERING WITH HONOURS (SEEEH)

UNDERGRADUATE BOOKLET

Academic Session 2022/2023

innovative • entrepreneurial • global

PROGRAMME GUIDELINES

The University adopts the semester system. The academic year is divided into two (2) normal semesters, namely Semester I and Semester II, and a short semester at the end of Semester II. Thus, intake of new undergraduate students is normally made during the semester I of an academic year. The minimum duration of the programmes is 4 years (8 semesters).

All the courses offered by the Faculty have credits except for courses, which are approved by the University Senate. One (1) credit is equivalent to 14 hours of lectures or 30 hours of practical sessions (studio/project), in a semester. The total number of credits required is 137, for Bachelor of Electrical Engineering with Honours.

All students' performance and achievements are assessed formally. Normally, every course is assessed based on the coursework, which constitutes not less than 50% of the overall marks, and a final exam paper, which constitutes another 50% of the overall marks. Coursework may be in the form of homework, quiz, test and presentation. Final examination is held at the end of each academic semester. Students' performance in a course is indicated by the letter grade. Generally, the passing grade for any course is a 'D+'. Students who fail a course (obtained a grade 'D' and below) are required to repeat the course the following semesters when it is offered. Students may improve the grade of any course with a 'B-' or lower grade. Subject to the Faculty and University's Academic Regulation, students may withdraw from a course. A student must pass all courses specified in his/her programme of study and fulfill all the requirements specified for his/her programme of study set by the Faculty and University in order to be awarded with the Bachelor degree.

Programme Learning Outcomes (PLO)

All undergraduate programme offered in FKE share a common Programme Learning Outcomes (PLO). After having completed the Bachelor degree programme, graduates should be able to demonstrate the following competencies:

Code	Programme Learning Outcomes
PLO1	Ability to apply knowledge of mathematics, science and electrical engineering to the solution of complex engineering problems.
PLO2	Ability to perform research-based analysis, conduct experiments and interpret data for complex engineering problems.
PLO3	Ability to identify, formulate, conduct research literature to analyse complex engineering problems using engineering knowledge.
PLO4	Ability to apply engineering practice and use modern engineering, and IT tools for complex engineering problems with an understanding of the limitations of the technology.
PLO5	Ability to design solutions for complex engineering problems and design systems and processes that meet specified needs with appropriate consideration for public health and safety, culture, society, and environment.
PLO6	Ability to articulate ideas, communicate effectively, in writing and verbally, on complex engineering activities with the engineering community and with society at large.
PLO7	Ability to function effectively as an individual, as a member or as a leader in diverse teams.
PLO8	Ability to recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
PLO9	Ability to comprehend the impact of global and contemporary issues, the role of engineers on society including, health, safety, legal and cultural issues, and the consequent responsibilities relevant to professional engineering practices and engineering problems.
PLO10	Ability to comprehend and evaluate the sustainability and impact of professional engineering work in the solutions of complex engineering problems in societal and environmental contexts.
PLO11	Ability to grasp and execute responsibility professionally and ethically in professional engineering practices.
PLO12	Ability to demonstrate knowledge and understanding of engineering and management principles, and economic decision-making to manage projects in multidisciplinary environments.

PLO Mapping to EAC Standard Requirements

FKE PLO	EAC Programme Outcome (PO)												Keyword
	1	2	3	4	5	6	7	8	9	10	11	12	
1	✓												Knowledge
2		✓											Analysis
3			✓										Design
4				✓									Investigate
5					✓								Modern Tool
6						✓							Engineer & Society
7							✓						Environment & Sustainability
8								✓					Ethics
9										✓			Communication
10									✓				Team Work
11												✓	Life Long Learning
12											✓		Management & Finance

PROFESSIONAL SKILLS CERTIFICATE (PSC)

UTM has designed its own UTM Professional Skills Certificate (UTM PSC) programme managed by UTM Institute for Life Ready Graduate (UTM iLeague) to enhance the knowledge and skills of UTM students. It provides students with value-added courses so that they will have a competitive-edge when they enter the employment market. Students will receive a Certificate of UTM Professional Skills Programme and the courses will appear in the student transcript. Students are required to undertake and must pass five (5) PSC courses as listed as follows:

No.	PSC COURSE	CODE
Compulsory Courses (all THREE (3) courses)		
1	Design Thinking for Entrepreneur	GLRB0010
2	Talent and Competency Management	GLRM0010
3	English Communication Skills for Graduating Students	GLRL0010
Elective Courses (any TWO (2) courses)		
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	Quality Management For Built Environment and Engineering Professionals	GLRT0050
6	Safety and Health Officer Introductory Course	GLRT0060
7	Industrial Machinery and Lubrication	GLRT0070

PRISMS (PROGRAM INTEGRASI SARJANA MUDA - SARJANA)

PRISMS is a newly introduced programme that integrates undergraduate high-level elective SE**5**3 courses with the core courses of the Master degree programme. Under PRISMS, students have an opportunity to complete and receive two degrees which are Bachelor degree and Master degree within 5 years (4+1).

Requirements

Students who have completed third year second semester courses with a cumulative grade point average (CGPA) of 3.3 and above.are eligible to apply for PRISMS. Students can apply using the PRISMS application form and must be recommended by the Academic Advisor, approved by the Program Director, and certified by the Dean of Faculty. Once the application to join PRISMS is approved, students can register for the SE**5**3 courses during the course pre-registration or compulsory registration period.

PRISMS Credit Transfer

Students must obtained grade B and above of the high-level elective SE**5**3 courses for vertical credit transfer into the Master degree program that students plan to enrol. Maximum unit allowed for the credit transfer is twelve (12) credits.

Bachelor of Electrical Engineering with Honours - SEEEH

Introduction

The Bachelor of Electrical Engineering with Honours (SEEEH) program is offered by the Faculty of Electrical Engineering to prepare graduates for careers in electrical engineering. Throughout the program, emphasis is placed on acquiring a thorough understanding of the basic principles and skills in Electrical Engineering. The curriculum includes core and specialised electrical engineering courses, related general education courses, and non-technical support courses.

The students' exposure to engineering practice is integrated within the curriculum through the combinations of industrial training and invited lectures from the industries. The program also provides the students with the opportunities for analytical, critical and constructive thinking besides communication, team-working and lifelong learning skills in order to prepare them for careers as an electrical engineer in private / public sectors or continuing education at postgraduate level.

Programme Specifications

The Bachelor of Electrical Engineering with Honours is offered either on a full-time or part time basis. The full-time programme is offered only at the UTM Main Campus in Johor Bahru while the part-time programme is offered at various learning centres throughout Malaysia. The duration of study for the full-time programme is subject to the student's entry qualifications and lasts between four (4) years to a maximum of six (6) years.

The programme is offered on full-time basis and is based on a 2-Semester per academic session. Generally, students are expected to undertake courses equivalent to between fifteen (15) to eighteen (18) credit hours per semester. Assessment is based on courseworks 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 Electrical Engineering with Honours
4.	Final Award	Bachelor of Electrical Engineering with Honours
5.	Programme Code	SEEEH
6.	Professional or Statutory Body of Accreditation	Board of Engineers Malaysia (BEM)
7.	Language(s) of Instruction	English and Bahasa Melayu

8.	Mode of Study (Conventional, distance learning, etc)		Conventional	
9.	Mode of operation (Franchise, self govern, etc)		Self-governing	
10.	Study Scheme (Full Time/Part Time)		Full Time	
11.	Study Duration		Minimum : 4 yrs Maximum : 6 yrs	
Type of Semester	No. of Semesters		No of Weeks/Semester	
	Full Time	Part Time	Full Time	Part Time
Normal	8	-	18	-
Short	4	-	10	-

Programme Educational Objectives (PEO)

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

Code	Intended Educational Objectives
PEO 1	Become Electrical Engineers who are competent, innovative, and productive in addressing customer needs.
PEO 2	Grow professionally with proficient soft skills.
PEO 3	Demonstrate high standards of ethical conduct, positive attitude, and societal responsibilities.

Award Requirements

To graduate, students must:

- Attain a total of not less than 137 credit hours (SEEEH) with a minimum CGPA of 2.0.
- Complete Professional Skills Certificates (PSC).

Course Classification

No.	Classification	Credit Hours	Percentage
i.	University Courses a. General b. Language c. Entrepreneurship d. Co-Curriculum	 26 6 2 2	26%
ii.	Faculty/Programme Core	86	63%
iii.	Programme Electives	15	11%
	Total	**137**	**100%**

A	Engineering Courses a) Lecture/Project/Laboratory b) Workshop/Field/Design Studio c) Industrial Training d) Final Year Project	 89 - 6 6	74%
	Total Credit Hours for Part A	**101**	
B	Related Courses a) Applied Science/Mathematic/Computer b) Management/Law/Humanities/Ethics/Economy c) Language d) Co-Curriculum	 15 13 6 2	26%
	Total Credit Hours for Part B	**36**	
	Total Credit Hours for Part A and B	**137**	100%
	Total Credit Hours to Graduate	**137 credit hours**	

Study Plan for Bachelor of Electrical Engineering with Honours – SEEEH

Code	Course	Credit	Pre-requisite	Total Credit
YEAR 1: SEMESTER 1				
SEEE 1012	Introduction to Electrical Engineering	2		**16**
SEEE 1013	Electrical Circuit Analysis	3		
SECP 1103	C Programming Techniques	3		
SSCE 1693	Engineering Mathematics I	3		
SEEE 1223	Digital Electronics	3		
ULRS 1012	Value and Identity	2		
YEAR 1: SEMESTER 2				
SEEE 1022	Introduction to Scientific Programming	2		**16**
SEEE 1073	Electronic Devices and Circuits	3	SEEE 1013	
SEMU 2113	Engineering Science	3		
SSCE 1793	Differential Equations	3		
SEEE 2133	Electronic Instrumentation and Measurement	3		
UHMS 1182	Appreciation of Ethics and Civilizations (for Local Students)	2		
UHLM 1012	Malay Language for Communication 2 (for International Students)			
YEAR 2: SEMESTER 1				
SEEE 2073	Signals and Systems	3		**16**
SEEE 2423	Fundamentals of Electrical Power Systems	3	SEEE 1013	
SSCE 1993	Engineering Mathematics II	3	SSCE 1693	
S*** ***3	Free Elective I	3		
UHLB 2122	Professional Communication Skills 1	2		
UKQF 2**2	Service Learning & Community Engagement	2		
YEAR 2: SEMESTER 2				
SEEE 2263	Digital Systems	3	SEEE 1223	**16**
SEEE 2523	Electromagnetic Field Theory	3	SSCE 1993	
SEEE 2742	2nd Year Electronic Design Laboratory	2		
SSCE 2193	Engineering Statistics	3		
SEEE 3533	Communication Principles	3	SEEE 2073	
UHIS 1022	Philosophy and Current Issues (for Local and International Students)	2		
UHMS 1182	Appreciation of Ethics and Civilizations (for Int. Students)			

YEAR 3: SEMESTER 1				
SEEE 3133	System Modeling and Analysis	3	SEEE 2073	**18**
SEEE 3223	Microprocessor	3	SEEE 1223	
SEEE 3732	Common 3rd Year Laboratory	2		
SEEE 4443	Power System Analysis	3	SEEE 2423	
SSCE 2393	Numerical Methods	3		
S*** ***2	Free Elective 2	2		
UHL* 1112	Foreign Language for Communication	2		
YEAR 3: SEMESTER 2				
SEEE 3143	Control System Design	3	SEEE 3133	**18**
SEEE 3742	Specialized 3rd Year Laboratory	2		
SEEE 4423	Power System Engineering	3	SEEE 4443	
SEEE 4433	Power Electronics and Drives	3	SEEE 2423	
SEEE 4463	High Voltage Technology	3	SEEE 4443	
UHLB 3132	Professional Communication Skills 2	2		
ULRS 3032	Entrepreneurship & Innovation	2		
YEAR 3: SEMESTER 3				
SEEE 4926	Practical Training	6		**6**
YEAR 4: SEMESTER 1				
SHMS 4542	Engineering Management	2		**16**
SEEE 4633	Electrical Machines	3	SEEE 2423	
SEEE 4723	Capstone Project	3		
SEEE 4812	Final Year Project Part I	2		
SEE* 4**3 / 5**3	Field Elective 1 / PRISMS Elective 1	3		
SEE* 4**3 / 5**3	Field Elective 2 / PRISMS Elective 2	3		
YEAR 4: SEMESTER 2				
SEEE 4012	Professional Engineering Practice	2		**15**
SEEE 4824	Final Year Project Part II	4	SEEE 4812	
SEE* 4**3 / 5**3	Field Elective 3 / PRISMS Elective 3	3		
SEE* 4**3 / 5**3	Field Elective 4 / PRISMS Elective 4	3		
SEE* 4**3	Field Elective 5	3		
CUMULATIVE CREDITS				**137**

FIELD ELECTIVES			
Code	**Course**	**Credit**	**Pre-requisite**
Power Engineering			
SEEE 4453	Power System Control	3	SEEE 4423
SEEE 4613	High Voltage Testing and Calibration	3	SEEE 4463
SEEE 4643	Control and Design of Power Electronic System	3	SEEE 4433
SEEE 4653	Photovoltaic and Wind Energy Systems	3	SEEE 4433
SEEE 4663	Electricity for Sustainable Energy	3	SEEE 4423
SEEE 4673	Electricity Market (Electrical Energy Market)	3	SEEE 4443
SEEE 4683	Power System Design and Operation	3	SEEE 4443
Control Engineering			
SEEE 4113	Modern Control Theory	3	SEEE 3143
SEEE 4153	Digital Control Systems	3	SEEE 3143
SEEE 4173	Industrial Process Control	3	SEEE 3143
SEEI 3133	Industrial Instrumentations and Applications	3	SEEE 2133
SEEI 4173	Advanced Transducers and Sensors	3	SEEI 3133
SEEI 4313	PLC and SCADA System Design	3	SEEE 3143
SEEI 4363	Industrial Control Network	3	SEEE 3143
SEEM 4173	Artificial Intelligence	3	
Electronic Engineering			
SEEL 3613	Semiconductor Materials Engineering	3	SEEE 1073
SEEE 3263	Electronic System	3	SEEE 1073
SEEL 4223	Digital Signal Processing 1	3	SEEE 2073
SEEL 4273	CAD with HDL	3	SEEE 2263
SEEL 4283	Analog CMOS IC Design	3	SEEE 1073
SEEL 4373	IC Testing Techniques	3	SEEE 2263 SEEL 4283
SEEL 4743	Basic Digital VLSI Design	3	SEEE 2263
Communication Engineering			
SEET 3573	Microwave Engineering	3	SEEE 3533
SEET 3583	Digital Communication Systems	3	SEEE 3533
SEET 3623	Data Communication and Networks	3	SEEE 3533
SEET 4523	Optical Communication Systems	3	SEEE 3533
SEET 4533	Wireless Communication Systems	3	SEET 3573
SEET 4543	RF Microwave Circuit Design	3	SEET 3573
SEET 4593	Acoustic Engineering	3	SEEE 3533
SEET 4613	Antenna Theory and Design	3	SEET 3573
SEET 4623	Network Programming	3	SEET 3623

PRISMS ELECTIVE COURSES

For students who intend to enrol into the PRISMS programme, refer to the PRISMS Section for a list of related elective courses associated with the postgraduate programmes.

SEEE Elective Courses for PRISM (choose maximum 4)			
Code	Course	Credit	Pre-requisite
SEEE 5533	Power Electronics Systems	3	
SEEE 5583	High Voltage and Electrical Insulation	3	
SEEE 5603	Power System Analysis and Computational Method	3	
SEEE 5633	Power System Devices and Apparatus	3	
SEEL 5123	Advanced Microprocessor System	3	
SEEL 5173	Advanced Digital System Design	3	
SEET 5313	Communications and Computer Networks	3	
SEET 5413	Advanced Digital Communication	3	
SEEL 5113	Advanced Nanoelectronics Devices	3	
SEEL 5193	Advanced Analog CMOS IC Design	3	
SEEM 5753	Advanced Instrumentation and Measurement	3	
SEEM 5713	Artificial Intelligence and Applications	3	
SEEM 5703	Control Systems Engineering	3	
SEET 5313	Communications and Computer Networks	3	
SEET 5513	Sustainable Design, Engineering and Management	3	
SEET 5423	Wireless Communication Systems	3	
SEET 5523	Internet of Things Technology	3	

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 courses are not allowed to graduate.

Bachelor of Electrical Engineering with Honours - SEEEH

NO	CODE	COURSE	CREDIT EARNED	CREDIT COUNTED	TICK (√) IF PASSED
BACHELOR OF ENGINEERING (ELECTRICAL)					
1.	SEEE 1012	Introduction to Electrical Engineering	2	2	
2.	SEEE 1013	Electrical Circuit Analysis	3	3	
3.	SEEE 1022	Introduction to Scientific Programming	2	2	
4.	SEEE 1073	Electronic Devices and Circuits	3	3	
5.	SEEE 1223	Digital Electronics	3	3	
6.	SEEE 2073	Signals and Systems	3	3	
7.	SEEE 2133	Electronic Instrumentation & Measurement	3	3	
8.	SEEE 2263	Digital Systems	3	3	
9.	SEEE 2423	Fundamentals of Electrical Power Systems	3	3	
10.	SEEE 2523	Electromagnetic Field Theory	3	3	
11.	SEEE 2742	2nd Year Electronic Design Lab	2	2	
12.	SEEE 3133	System Modeling & Analysis	3	3	
13.	SEEE 3143	Control System Design	3	3	
14.	SEEE 3223	Microprocessor	3	3	
15.	SEEE 3533	Communication Principles	3	3	
16.	SEEE 3732	Common 3rd Year Laboratory	2	2	
17.	SEEE 3742	Specialized 3rd Year Laboratory	2	2	
18.	SEEE 4012	Professional Engineering Practice	2	2	
19.	SEEE 4423	Power System Engineering	3	3	
20.	SEEE 4433	Power Electronics and Drives	3	3	

21.	SEEE 4443	Power System Analysis	3	3	
22.	SEEE 4463	High Voltage Technology	3	3	
23.	SEEE 4633	Electrical Machines	3	3	
24.	SEEE 4723	Capstone Project	3	3	
25.	SEEE 4812	Final Year Project Part I	2	2	
26.	SEEE 4824	Final Year Project Part II	4	4	
27.	SEEE 4926	Practical Training	6	HL	
28.	SEE* 4**3 / SEE* 5**3	Field Elective 1 / PRISMS Elective 1	3	3	
29.	SEE* 4**3 / SEE* 5**3	Field Elective 2 / PRISMS Elective 2	3	3	
30.	SEE* 4**3 / SEE* 5**3	Field Elective 3 / PRISMS Elective 3	3	3	
31.	SEE* 4**3 / SEE* 5**3	Field Elective 4 / PRISMS Elective 4	3	3	
32.	SEE* 4**3	Field Elective 5	3	3	
33.	SECP 1103	C Programming Techniques	3	3	
34.	SEMU 2113	Engineering Science	3	3	
35.	SHMS 4542	Engineering Management	2	2	
		TOTAL CREDIT OF ENGINEERING COURSES(a)	**101**	**101**	
MATHEMATICS COURSES (Faculty of Science)					
1.	SSCE 1693	Engineering Mathematics I	3	3	
2.	SSCE 1793	Differential Equations	3	3	
3.	SSCE 1993	Engineering Mathematics II	3	3	
4.	SSCE 2193	Engineering Statistics	3	3	
5.	SSCE 2393	Numerical Methods	3	3	
		TOTAL CREDIT OF MATHEMATICS COURSES (b)	**15**	**15**	

UNIVERSITY GENERAL COURSES					
Cluster 1: Malaysia Core Value (Faculty of Social Sciences and Humanities)					
1.	UHMS 1182	Appreciation of Ethics and Civilizations (for Local Students)	2	2	
	UHIS 1022 OR UHMS 1182	Philosophy and Current Issues (for International Students) OR Appreciation of Ethics and Civilizations (for International Students			
2.	UHIS 1022	Philosophy and Current Issues (for Local Students)	2	2	
	UHLM 1012	Malay Language 2 (for International Students)			
Cluster 2: Value and Identity					
1.	ULRS 1012	Value and Identity	2	2	
Cluster 3: Global Citizen (Co-Curriculum and Service Learning)					
1.	UKQF 2**2	Service Learning & Community Engagement	2	2	
Cluster 4: Communication Skills (Language Academy, Faculty of Social Sciences and Humanities)					
1.	UHLB 2122	Professional Communication Skills 1	2	2	
2.	UHLB 3132	Professional Communication Skills 2	2	2	
3.	UHL* 1112	Foreign Language for Communication	2	2	
Cluster 5: Enterprising Skills					
1.	ULRS 3032	Entrepreneurship & Innovation	2	2	
FREE ELECTIVE COURSES					
1.	S*** ***3	Free Elective I	3	3	
2.	S*** ***2	Free Elective 2	2	2	
		TOTAL CREDIT of UNIVERSITY GENERAL COURSES (c)	**21**	**21**	
		TOTAL CREDIT TO GRADUATE (a + b + c)	**137**	**131**	
OTHER COMPULSORY COURSES - PROFESSIONAL SKILLS CERTIFICATE (PSC). ● Students are required to enroll and pass FIVE (5) PSC courses, in order to be eligible to graduate.					
COMPULSORY PSC COURSES (Enroll all 3 courses)					
1	GLRB 0011	Design Thinking for Entrepreneur			
2	GLRM 0010	Talent and Competency Management			
3	GLRL 0010	English Communication Skills for Graduating Students (ECS)			
ELECTIVE PSC COURSE (Choose 2 only)					
1	GLRT 0010	Data Analytics for Organization			
2	GLRM 0020	Professional Ethics and Integrity			

3	GLRT 0020	Construction Measurement (Mechanical & Electrical Works)	
4	GLRT 0030	OSHE For Engineering Industry and Laboratory	
5	GLRT 0050	Quality Management For Built Environment and Engineering Professionals	
6	GLRT 0060	Safety and Health Officer Introductory Course	
7	GLRT 0070	Industrial Machinery and Lubrication	

For any enquiry or further information, you may contact:

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