UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Faculty of Electrical Engineering

BACHELOR OF ELECTRONIC ENGINEERING WITH HONOURS - SEELH

UNDERGRADUATE BOOKLET

Academic Session
2022/2023

Profile Page

BACHELOR OF ELECTRONIC ENGINEERING WITH HONOURS – SEELH

Name of Student : _____

Matric. No. : _____

Phone No. : _____

Email : _____

Name of Academic Advisor : _____

A journey of thousand miles begins with a single step.

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 for the Bachelor of Electronic Engineering with Honours (SEELH) programme is 137 credits.

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 fulfil 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

The PLOs are mapped using the guidelines set by the Engineering Council to those required by the Engineering Accreditation Council (EAC), Malaysia.

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	GLT0060

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 obtain 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 enroll. Maximum unit allowed for the credit transfer is twelve (12) credits.

BACHELOR OF ELECTRONIC ENGINEERING WITH HONOURS (SEELH)

Introduction

A rapid development in electronics, computer and telecommunication industry is one of the major contributors to the Malaysian economy. Rapid development has enabled the electronic, computer and telecommunication industry to flourish. This means that more and more competent electronic graduates are required, to meet the growing demand of skilled manpower. The requirements towards professionals in this field is gradually intensifying and it is predicted that the need will be continued in the next few years. Electronic Engineering is a vast area of studies and is gradually expanding. Graduates undertaking this programme will face a demanding professional career ahead. Various courses are being offered within the programme with the intention of preparing graduates with sufficient knowledge in the electronic field.

Programme Specifications

The Bachelor of Electronic 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 subjected 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.

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	Educational Objectives
PEO1	Become Electronic Engineers who are competent, innovative, and productive in addressing customer needs.
PEO2	Grow professionally with proficient soft skills.
PEO3	Demonstrate high standards of ethical conduct, positive attitude, and societal responsibilities.

Programme General Information

1.	Awarding Institution	**Universiti Teknologi Malaysia**
2.	Teaching Institution	**Universiti Teknologi Malaysia**
3.	Programme Name	**Bachelor of Electronic Engineering with Honours**
4.	Final Award	**Bachelor of Electronic Engineering with Honours**
5.	Programme Code	**SEELH**
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**	**-**

Course Classification

Bachelor of Electronic Engineering with Honours - SEELH

No.	Classification	Credit Hours	Percentage
i.	University General Courses	16	11.7%
ii.	Mathematics	15	10.9%
iii.	Programme Core	77	56.2%
iv.	Programme Electives	24	17.5%
v.	Free Electives	5	3.7%
	Total	**137**	**100%**
A	Engineering Courses		
	a) Lecture/Project/Laboratory	89	73.7%
	b) Workshop/Field/Design Studio	-	
	c) Industrial Training	6	
	d) Final Year Project	6	
Total Credit Hours for Part A		**101**	
B	Related Courses		
	a) Applied Science/Mathematic/Computer	15	26.3%
	b) Management/Law/Humanities/Ethics/ Economy	8	
	c) Language	6	
	d) Co-Curriculum	2	
	e) Free Electives	5	
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**	

Award Requirements

To graduate, students must:

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

STUDY PLAN

Bachelor of Electronic Engineering with Honours – SEELH
Cohort 2022/2023

Code	Course	Credit	Pre-requisite	Total Credit
YEAR 1: SEMESTER 1				
SEEE 1012	Introduction to Electrical Engineering	2		**15**
SEEE 1013	Electrical Circuit Analysis	3		
SEEE 1022	Introduction to Scientific Programming	2		
SEEE 1223	Digital Electronics	3		
SSCE 1693	Engineering Mathematics 1	2		
ULRS 1012	Value and Identity	3		
YEAR 1: SEMESTER 2				
SECP 1103	C Programming Techniques	3		**17**
SEEE 1073	Electronic Devices and Circuits	3	SEEE 1013	
SEEE 2133	Electronic Instrumentation and Measurement	3		
SEMU 2113	Engineering Science	3		
SSCE 1793	Differential Equations	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	Signal and Systems	3		**16**
SEEE 2423	Fundamentals of Electrical Power Systems	3	SEEE 1013	
SSCE 1993	Engineering Mathematics 2	3	SSCE 1693	
SEEE 2263	Digital Systems	3	SEEE 1223	
SEEE 2742	2nd Year Electronic Design Laboratory	2		
UKQF 2**2	Service Learning & Community Engagement	2		
YEAR 2: SEMESTER 2				
SEEE 2523	Electromagnetic Field Theory	3	SSCE 1993	**16**
SEEE 3223	Microprocessor	3	SEEE 1223	
UHLB 2122	Professional Communication Skills 1	2		
SEEE 3263	Electronic Systems	3	SEEE 1073	
SSCE 2193	Engineering Statistics	3		
UHIS 1022	Philosophy and Current Issues (for Local Students)	2		
UHIS 1022 OR UHMS 1182	Philosophy and Current Issues OR Appreciation of Ethics and Civilizations (for International Students)			

YEAR 3: SEMESTER 1				
SEEE 3133	System Modelling and Analysis	3	SEEE 2073	**18**
SEEE 3533	Communication Principles	3	SEEE 2073	
SEEE 3732	Common 3rd Year Laboratory	2		
SSCE 2393	Numerical Methods	3		
UHL* 1112	Foreign Language for Communication	2		
UHLB 3132	Professional Communication Skills 2	2		
S*** ***3	Free Elective 1	3		
YEAR 3: SEMESTER 2				
SEEE 3143	Control System Design	3	SEEE 3133	**18**
SEEL 3742	Specialized 3rd Year Laboratory	2		
SEEL 4223	Digital Signal Processing 1	3	SEEE 2073	
SEE* ***3	Field Core 1	3		
SEE* ***3	Field Core 2	3		
S*** ***2	Free Elective 2	2		
ULRS 3032	Entrepreneurship & Innovation	2		
YEAR 3: SEMESTER 3				
SEEL 4926	Practical Training	6		**6**
YEAR 4: SEMESTER 1				
SHMS 4542	Engineering Management	2		**16**
SEEL 4723	Capstone Project	3		
SEEL 4812	Final Year Project Part 1	2		
SEE* ***3 / 5**3	Field Elective 1 / PRISMS Elective 1	3		
SEE* ***3 / 5**3	Field Elective 2 / PRISMS Elective 2	3		
SEE* ***3	Field Elective 3	3		
YEAR 4: SEMESTER 2				
SEEE 4012	Professional Engineering Practice	2		**15**
SEEL 4824	Final Year Project Part 2	4	SEEL 4812	
SEE* ***3 / 5**3	Field Elective 4 / PRISMS Elective 3	3		
SEE* ***3 / 5**3	Field Elective 5 / PRISMS Elective 4	3		
SEE* ***3	Field Elective 6	3		
CUMULATIVE CREDITS				**137**

Elective Fields

1. Electronic System Design

Field Core			
Code	**Course**	**Credit**	**Pre-requisite**
SEEL 4273	CAD with HDL	2	SEEE 2263
SEEL 4743	Basic Digital VLSI Design	3	SEEE 2263
Field Elective			
SEEL 4283	Analog CMOS IC Design	3	SEEE 1073
SEEL 4293	Advanced Digital Signal Processing	3	SEEL 4223
SEEL 4333	Computer Architecture and Organization	3	SEEE 2263
SEEL 4363	Digital Image Processing	3	SEEL 4223
SEEL 4373	IC Testing Techniques	3	SEEE 2263
SEEL 4663	Embedded Processor System	3	SEEE 3223 SECP 1103
SEEL 4673	DSP Architectures	3	

2. Microelectronics

Field Core			
Code	**Course**	**Credit**	**Pre-requisite**
SEEL 3613	Semiconductor Material Engineering	3	SEEE 1073
SEEL 4743	Basic Digital VLSI Design	3	SEEE 2263
Field Elective			
SEEL 4283	Analog CMOS IC Design	3	SEEE 1073
SEEL 4373	IC Testing Techniques	3	SEEE 2263
SEEL 4613	Semiconductor Device Engineering	3	SEEL 3613
SEEL 4623	Solid-State Electronic Devices	3	SEEL 3613
SEEL 4633	Microelectronic Device Fabrication and Characterization	3	SEEL 3613
SEEL 4643	Nanoelectronics	3	
SEEL 4653	Modelling and Simulation of Microelectronic Devices	3	
SEEI 4233	Nanotechnology and Application	3	

3. Computer Engineering

Field Core			
Code	**Course**	**Credit**	**Pre-requisite**
SEEL 4333	Computer Architecture and Organization	3	SEEE 2263
SEEL 4663	Embedded Processor System	3	SEEE 3223 SECP 1103
Field Elective			
SECR 2043	Operating System	3	SECP 1103
SEEL 4213	Software Engineering	3	SECP 1103
SEEL 4273	CAD with HDL	3	SEEE 2263
SEEL 4343	Information Security	3	SEEE 1223
SEEL 4673	DSP Architectures	3	SEEE 2263
SEEM 4173	Artificial Intelligence	3	
SEET 3623	Data Communication and Networks	3	SEEE 3533

4. Medical Electronics

Field Core			
Code	**Course**	**Credit**	**Pre-requisite**
SEEL 3503	Physiology and Introduction to Medicine	3	
SEEL 4523	Medical Instrumentation	3	SEEE 2133
Field Elective			
SEBB 3313	Biomedical Material	3	
SEEL 4273	CAD with HDL	3	SEEE 2263
SEEL 4513	Clinical Engineering	3	SEEL 3503
SEEL 4533	Biomedical Signal Processing	3	SEEL 4223
SEEL 4543	Biosystem Modelling	3	SEEL 3503
SEEL 4553	Medical Imaging	3	SEEL 4223
SEEL 4563	Biosensors and Transducers	3	SEEE 2133
SEEL 4573	Rehabilitation Engineering	3	

5. Telecommunication Engineering

Field Core			
Code	**Course**	**Credit**	**Pre-requisite**
SEET 3573	Microwave Engineering	3	SEEE 3533
SEET 3623	Data Communication and Networks	3	SEEE 3533
Field Elective			
SEET 3583	Digital Communication System	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
SEET 4633	Coding of Multimedia Signals	3	SEET 3583
SEET 4643	Optical Materials and Sensors	3	SEET 4523
SEET 4653	Measurement and Characterization of Optical Devices	3	SEET 4523
SEET 4663	Optical Network	3	SEET 4523

PRISMS Elective Courses for SEELH

Choose maximum of FOUR (40 courses			
Code	Course	Credit	Pre-requisite
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.

NO	CODE	COURSE	CREDIT EARNED	CREDIT COUNTED	TICK (/) IF PASSED
ENGINEERING COURSE					
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	Signal 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 3263	Electronic System	3	3	
16	SEEE 3533	Communication Principles	3	3	
17	SEEE 3732	Common 3rd year Laboratory	2	2	
18	SEEE 4012	Professional Engineering Practice	2	2	
19	SEEL 3742	Specialized 3rd year Laboratory	2	2	
20	SEEL 4223	Digital Signal Processing 1	3	3	
21	SEEL 4723	Capstone Project	3	3	
22	SEEL 4812	Final Year Project Part 1	2	2	
23	SEEL 4824	Final Year Project Part 2	4	4	
24	SEEL 4926	Practical Training	6	HL	
25	SEMU 2113	Engineering Science	3	3	
26	SEE* ***3	Field Core 1	3	3	
27	SEE* ***3	Field Core 2	3	3	
28	SEE* ***3 / SEE* 5**3	Field Elective 1 / PRISMS Elective 1	3	3	
29	SEE* ***3 / SEE* 5**3	Field Elective 2 / PRISMS Elective 2	3	3	
30	SEE* ***3 / SEE* 5**3	Field Elective 3 / PRISMS Elective 3	3	3	
31	SEE* ***3 / SEE* 5**3	Field Elective 4 / PRISMS Elective 4	3	3	

32	SEE* ***3	Field Elective 5	3	3	
33	SEE* ***3	Field Elective 6	3	3	
34	SECP 1103	C Programming Techniques	3	3	
35	SHMS 4542	Engineering Management	2	2	
		Total Credit Of Engineering Courses (A)	**101**	**95**	
MATHEMATICS COURSES					
1	SSCE 1693	Engineering Mathematics 1	3	3	
2	SSCE 1793	Differential Equations	3	3	
3	SSCE 1993	Engineering Mathematics 2	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					
1	UHMS 1182	Appreciation of Ethics and Civilizations (for Local Students)	2	2	
	UHIS 1022 OR UHMS 1182	Philosophy and Current Issues 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					
1	UKQF 2**2	Service Learning & Community Engagement	2	2	
Cluster 4: Communication Skill					
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 Skill					
1	ULRS 3032	Entrepreneurship & Innovation	2	2	
		Total Credit of University General Courses (C)	16	16	
FREE ELECTIVE COURSES					
1	S*** ***3	Free Elective 1	3	3	
2	S*** ***2	Free Elective 2	2	2	
		Total Credit of Free Elective Courses (D)	**5**	**5**	
Total Credit to Graduate (A + B + C + D)			**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	GLRB0010	Design Thinking for Entrepreneur	
2	GLRM0010	Talent and Competency Management	
3	GLRL0010	English Communication Skills for Graduating Students	
ELECTIVE PSC COURSE (Choose 2 only)			
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	GLRT0050	Quality Management For Built Environment and Engineering Professionals	
6	GLRT0060	Safety and Health Officer Introductory Course	
7	GLRT0070	Industrial Machinery and Lubrication	

LIST OF STAFF
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PLC, LLD, Petri Net, FPGA, IC Design, verilog, image processing, Embedded system, AI, automation, robotic, compiler, and custom software solution

Course Approval

More than 18credits

Students are not allowed to take more than 21 credit hours

21 credits

Academic Advisor + Dean

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Academic Advisor + Deputy Dean (AA)

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