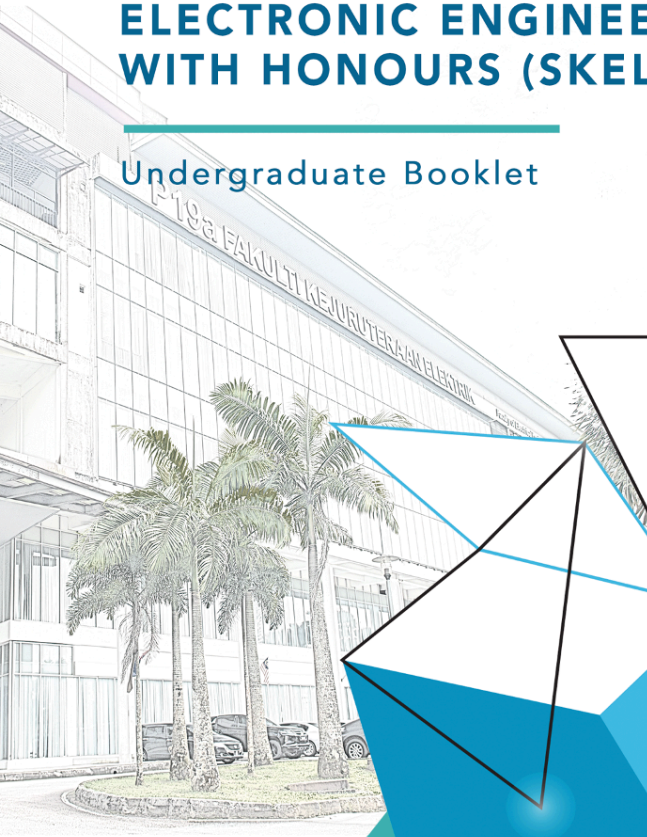
UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Faculty of
Electrical Engineering

Academic Session
2024/2025

BACHELOR OF ELECTRONIC ENGINEERING WITH HONOURS (SKELH)

Undergraduate Booklet



www.fke.utm.my

BACHELOR OF ELECTRONIC ENGINEERING WITH HONOURS (SKELH)

I am : _____

Matric. No. : _____

Phone No. : _____

Email : _____

Academic Advisor :

Phone No. : _____

Email : _____

Programme Guideline

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

All 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 (SKELH) 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%. Coursework can 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 failed 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 with a maximum of 15 credits allowed. Subject to the Faculty and University's Academic Regulation, students may withdraw from a course within the stipulated period. Other information on academic regulation can be retrieved from UTM website (UTM Academic Regulations).

A student must pass all courses specified in the programme of study and fulfil all the requirements specified for the programme of study set by the Faculty and University in order to be awarded with the Bachelor degree.

Programme Learning Outcomes

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

PLO	Statements
PLO1 (Engineering Knowledge)	Apply knowledge of mathematics, natural science, computing and engineering fundamentals, and electrical engineering specialization to develop solutions to complex engineering problems.
PLO2 (Problem Analysis)	Identify, formulate, conduct research literature and analyze complex engineering problem reaching substantiated conclusions using principles of mathematics, sciences and electrical engineering with holistic considerations for sustainable development.
PLO3 (Design/ Development of Solutions)	Design creative solutions for complex engineering problems and design systems, components or processes to meet identified needs with appropriate consideration for public health and safety, whole-life cost, net-zero carbon as well as resource, cultural, societal, and environmental considerations as required.
PLO4 (Investigation)	Conduct investigation of complex engineering problems using research methods including research-based knowledge, including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.
PLO5 (Tool Usage)	Create, select and apply, and recognize limitation of appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems.
PLO6 (The Engineer and the World)	Analyze and evaluate sustainable development impacts to: society, the economy, sustainability, health and safety, legal frameworks, and the environment, in solving complex engineering problems.
PLO7 (Ethics)	Apply ethical principles and commit to professional ethics and norms of engineering practice and adhere to relevant national and international laws. Demonstrate an understanding of the need for diversity and inclusion.
PLO8 (Individual and Collaborative Team Work)	Function effectively as an individual, and as a member or leader in diverse and inclusive teams and in multidisciplinary, face-to- face, remote and distributed settings.
PLO9 (Communication)	Communicate effectively and inclusively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, taking into account cultural, language, and learning differences.
PLO10 (Project Management and Finance)	Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects in multidisciplinary environments.
PLO11 (Life Long Learning)	Recognise the need for, and have the preparation and ability for i) independent and lifelong learning, ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change.

PROFESSIONAL SKILLS CERTIFICATE (PSC)

UTM has designed its own UTM Professional Skills Certificate (UTM PSC) to enhance the knowledge and skills of UTM students. It provides students with value-added courses so that they will have a competitive-edge skills when they enter the employment market. Students are compulsory to take the courses in order to graduate, the courses taken will appear in the student transcript. Students are required to undertake and must pass five (5) PSC courses as listed as follows in order to graduate:

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) OF THESE 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
7	Industrial Machinery and Lubrication	GLRT0070

PRISMS
(PROGRAM INTEGRASI SARJANA MUDA- SARJANA)

WHAT IS PRISMS?

PRISMS is a programme that integrates under-graduate high-level elective SKE* 53 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).**

PRISMS CREDIT TRANSFER

Students must obtain grade B and above of the high-level elective SKE* 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.

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 SKE* 5**3 courses during the course pre-registration or compulsory registration period.

For more information on PRISMS, kindly visit FKE website at https://fke.utm.my

STUDY PLAN
BACHELOR OF ELECTRONIC ENGINEERING WITH HONOURS - SKELH
COHORT 2024/2025

COURSE MENU YEAR 1

CODE	COURSE	CREDIT	PRE-REQUISITE
SEMESTER 1			
ULRS 1032	Integrity and Anti-Corruption	2	
SSCE 1693	Engineering Mathematics I	3	
SKEE 1012	Introduction to Electrical Engineering	2	
SKEE 1013	Electrical Circuit Analysis	3	
SKEE 1033	Scientific Programming	3	
SKEE 1233	Digital Electronic Systems	3	
	Total Credits	**16**	
SEMESTER 2			
SSCE 1793	Differential Equations	3	SSCE 1693
SEMU 2113	Engineering Science	3	
SKEE 1103	C Programming for Engineers	3	
SKEE 1073	Electronic Devices and Circuits	3	SKEE 1013
SKEE 2133	Electronic Instrumentation and Measurement	3	
ULRS 1182	Appreciation of Ethics and Civilizations(for Local Students)	2	
UHLM 1012	Malay Language for Communication 2(for International Students)		
	Total Credits	**17**	

STUDY PLAN
COURSE MENU YEAR 2

CODE	COURSE	CREDIT	PRE-REQUISITE
SEMESTER 3			
SSCE 1993	Engineering Mathematics II	3	SSCE 1693
SKEE 2073	Signal and Systems	3	
SKEE 3223	Microprocessor	3	SKEE 1233
SKEE 2433	Principles of Electrical Power Systems	3	SKEE 1013
SKEE 3263	Electronic Systems	3	SKEE 1073
SKEE 2752	Electronic Design Laboratory	2	
	Total Credits	**17**	
SEMESTER 4			
SSCE 2193	Engineering Statistics	3	
SKEE 2523	Electromagnetic Field Theory	3	SSCE 1993
SKEE 3133	System Modelling and Analysis	3	SKEE 2073
SKEL 3233	Digital Signal Processing	3	SKEE 1073
UHLB 2122	Professional Communication Skills 1	2	
ULRF 2**2	Elective of Service Learning and Community Engagement	2	
ULRS 1022	Philosophy and Current Issues (for Local Students)	2	
ULRS 1022 OR ULRS 1182	Philosophy and Current Issues OR Appreciation of Ethics and Civilizations (for International Students)		
	Total Credits	**18**	

STUDY PLAN
COURSE MENU YEAR 3

CODE	COURSE	CREDIT	PRE-REQUISITE
SEMESTER 5			
UHL* 1112	Elective of Foreign Language for Communication	2	
UHLB 3132	Professional Communication Skills 2	2	
SSCE 2393	Numerical Methods	3	
SKEE 3143	Control System Design	3	SKEE 3133
SKEE 3533	Communication Principles	3	SKEE 2073
SKEE 3732	Common Third Year Laboratory	2	
S*** ***3	Free Elective 1	3	
	Total Credits	**18**	
SEMESTER 6			
SKEE 3733	Integrated Design Project	3	
SKEL 3383	RTL Design	3	SKEE 1233
SKEE 3742	Specialized Third Year Laboratory	2	
SKE* ***3	Field Core 1	3	
SKE* ***3	Field Core 2	3	
S*** ***2	Free Elective 2	2	
ULRS 3032	Entrepreneurship & Innovation	2	
	Total Credits	**18**	
YEAR 3: SHORT SEMESTER			
SKEE 3925	Industrial Training	5	
	Total Credits	**5**	

STUDY PLAN
COURSE MENU YEAR 4

CODE	COURSE	CREDIT	PRE-REQUISITE
SEMESTER 7			
SKEE 4542	Engineering Management Principles	2	
SKEE 4813	Methodology of Research and Development	3	
SKE* ***3	Field Elective 1 / PRISMS Elective 1	3	
SKE* ***3	Field Elective 2 / PRISMS Elective 2	3	
SKE* ***3	Field Elective 3 / PRISMS Elective 3	3	
SKE* ***3	Field Elective 4 / PRISMS Elective 4/ Faculty Free Elective 1	3	
	Total Credits	**17**	
SEMESTER 8			
SKEE 4012	Professional Engineering Practice	2	
SKEE 4826	Final Year Project	6	SKEE 4813
SKE* ***3	Field Elective 5 / Faculty Free Elective 2	3	
	Total Credits	**11**	
CUMULATIVE CREDITS		**137**	

ELECTIVE FIELDS

1. ELECTRONIC SYSTEM DESIGN

Type of Elective	Course Code	Course Name	Credit Hours	Total Credit
Core Elective	SKEL 4743	Basic Digital VLSI Design	3	6
	SKEL 4373	IC Testing Techniques	3	
Field Elective (*choose 5)	SKEL 4293	Advanced Digital Signal Processing	3	15
	SKEL 4333	Computer Architecture and Organization	3	
	SKEL 4363	Digital Image Processing	3	
	SKEL 4283	Analog CMOS IC Design	3	
	SKEL 4663	Embedded Processor System	3	
	SKEL 4673	DSP Architectures	3	
	SKEE 4513	Special Topic in Electrical Engineering	3	
Total Credit Hours				**21**

2. MICROELECTRONICS

Type of Elective	Course Code	Course Name	Credit Hours	Total Credit
Core Elective	SKEL 3613	Semiconductor Material Engineering	3	6
	SKEL 4743	Basic Digital VLSI Design	3	
Field Elective (*choose 5)	SKEL 4283	Analog CMOS IC Design	3	15
	SKEL 4373	IC Testing Techniques	3	
	SKEL 4613	Semiconductor Device Engineering	3	
	SKEL 4623	Solid State Electronic Device	3	
	SKEL 4633	Microelectronic Device Fabrication and Characterization	3	
	SKEL 4683	Nanoelectronics Materials and Applications	3	
	SKEL 4653	Modelling and Simulation of Microelectronic Devices	3	
	SKEE 4513	Special Topic in Electrical Engineering	3	
Total Credit Hours				**21**

ELECTIVE FIELDS

3. COMPUTER ENGINEERING

Type of Elective	Course Code	Course Name	Credit Hours	Total Credit
Core Elective	SKEL 4333	Computer Architecture and Organization	3	6
	SKEL 4663	Embedded Processor System	3	
Field Elective (*choose 5)	SKEL 4213	Software Engineering	3	15
	SKEL 4343	Information Security	3	
	SKEL 4673	DSP Architectures	3	
	SECR 2043	Operating System	3	
	SKEM 4173	Artificial Intelligence	3	
	SKET 3623	Data Communication and Networks	3	
	SKEE 4513	Special Topic in Electrical Engineering	3	
Total Credit Hours				**21**

4. MEDICAL ELECTRONICS

Type of Elective	Course Code	Course Name	Credit Hours	Total Credit
Core Elective	SKEB 3503	Physiology and Introduction to Medicine	3	6
	SKEB 3043	Instrumentation and Measurement in Biomedical	3	
Field Elective (*choose 5)	SKEB 3423	Clinical Engineering 1	3	15
	SKEB 4023	Biomedical Signal Processing	3	
	SKEL 4543	Biosystem Modelling	3	
	SKEB 3023	Biomedical Imaging	3	
	SKEL 4563	Biosensors and Transducers	3	
	SKEB 3313	Biomedical Materials	3	
	SKEE 4513	Special Topic in Electrical Engineering	3	
Total Credit Hours				**21**

ELECTIVE FIELDS

5. TELECOMMUNICATION ENGINEERING				
Type of Elective	**Course Code**	**Course Name**	**Credit Hours**	**Total Credit**
Core Elective	SKET 3573	Microwave Engineering	3	6
	SKET 3623	Data Communication and Networks	3	
Field Elective (*choose 5)	SKET 3583	Digital Communication Systems	3	15
	SKET 4523	Optical Communication Systems	3	
	SKET 4533	Wireless Communication Systems	3	
	SKET 4543	RF Microwave Circuit Design	3	
	SKET 4593	Acoustic Engineering	3	
	SKET 4613	Antenna Theory and Design	3	
	SKET 4623	Network Programming	3	
	SKET 4643	Optical Materials and Sensors	3	
	SKET 4663	Optical Network	3	
	SKEE 4513	Special Topic in Electrical Engineering	3	
Total Credit Hours				**21**

PRISMS COURSES

Type of Elective	Course Code	Course Name	Credit Hours	Total Credit
Field Elective (*maximum choose 4)	SKEL 5113	Advanced Nanoelectronics Devices	3	**12**
	SKEL 5123	Advanced Microprocessor System	3	
	SKEL 5173	Advanced Digital System Design	3	
	SKEL 5193	Advanced Analog CMOS IC Design	3	
	SKET 5313	Communication and Computer Networks	3	
	SKET 5423	Advanced Wireless Communication Systems	3	
	SKET 5513	Sustainable Design, Engineering andManagement	3	
	SKET 5523	Internet of Things Technologies	3	

AWARD REQUIREMENTS

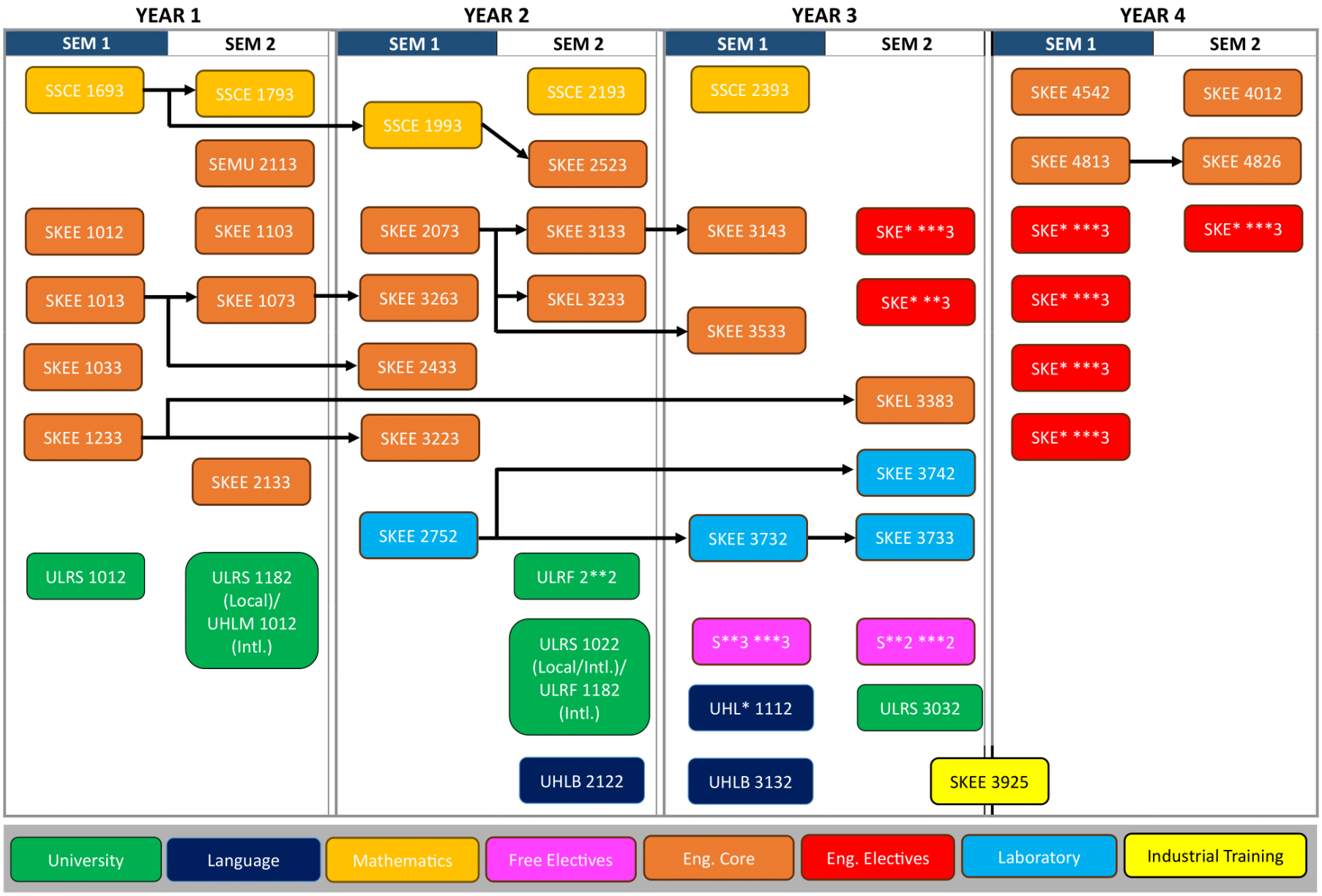
To graduate, students must:

1) Attain a total of not less than 137 credit hours

2) Attain a minimum CGPA of 2.0.

3) Complete Professional Skills Certificates (PSC).

COURSE FLOW SKELH 2024/2025



GRADUATION CHECKLIST

NO	CODE	COURSE	CREDIT EARNED	CREDIT COUNTED	TICK (/) IF PASSED
ENGINEERING COURSES					
1	SKEE 1012	Introduction to Electrical Engineering	2	2	
2	SKEE 1013	Electrical Circuit Analysis	3	3	
3	SKEE 1033	Scientific Programming	3	3	
4	SKEE 1073	Electronic Devices and Circuits	3	3	
5	SKEE 1233	Digital Electronic Systems	3	3	
6	SKEE 2073	Signal and Systems	3	3	
7	SKEE 2133	Electronic Instrumentation & Measurement	3	3	
8	SKEE 2433	Principles of Electrical Power Systems	3	3	
9	SKEE 2523	Electromagnetic Field Theory	3	3	
10	SKEE 2752	Electronic Design Laboratory	2	2	
11	SKEE 3133	System Modeling & Analysis	3	3	
12	SKEE 3143	Control System Design	3	3	
13	SKEE 3223	Microprocessor	3	3	
14	SKEE 3263	Electronic Systems	3	3	
15	SKEL 3383	RTL Design	3	3	
16	SKEE 3533	Communication Principles	3	3	
17	SKEE 3732	Common Third Year Laboratory	2	2	
18	SKEE 4012	Professional Engineering Practice	2	2	
19	SKEE 3742	Specialized Third Year Laboratory	2	2	
20	SKEL 3233	Digital Signal Processing	3	3	
21	SKEE 3733	Integrated Design Project	3	3	
22	SKEE 4813	Methodology of Research and Development	3	3	
23	SKEE 4826	Final Year Project	6	6	
24	SKEE 3925	Industrial Training	5	HL	
25	SEMU 2113	Engineering Science	3	3	
26	SKE* ***3	Field Core 1	3	3	
27	SKE* ***3	Field Core 2	3	3	
28	SKE* ***3 / SKE* 5**3	Field Elective 1 / PRISMS Elective 1	3	3	
29	SKE* ***3 /SKE* 5**3	Field Elective 2 / PRISMS Elective 2	3	3	
30	SKE* ***3 /SKE* 5**3	Field Elective 3 / PRISMS Elective 3	3	3	
31	SKE* ***3 /SKE* 5**3	Field Elective 4 / PRISMS Elective 4 /Faculty Free Elective 1	3	3	
32	SKE* ***3	Field Elective 5 / Faculty Free Elective 2	3	3	
33	SKEE 1103	C Programming for Engineers	3	3	
34	SKEE 4542	Engineering Management Principles	2	2	
		Total Credit of Engineering Courses (A)	**101**	**96**	

GRADUATION CHECKLIST

NO	CODE	COURSE	CREDIT EARNED	CREDIT COUNTED	TICK (/) IF PASSED
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	ULRS 1182	Appreciation of Ethics and Civilizations (for Local Students)	2	2	
	ULRS 1022 or ULRS 1182	Philosophy and Current Issues OR Appreciation of Ethics and Civilizations (for International Students			
2	ULRS 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 1032	Integrity and Anti- Corruption	2	2	
Cluster 3: Global Citizen					
1	ULRF 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**	**132**	

GRADUATION CHECKLIST

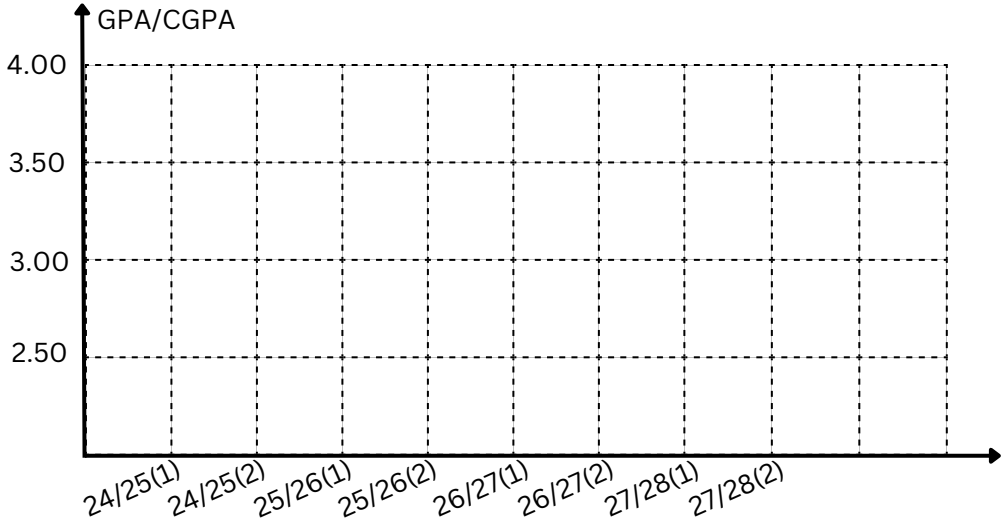
OTHER COMPULSORY COURSES
PROFESSIONAL SKILLS CERTIFICATE (PSC)

Students are required to enrol and pass FIVE (5) PSC courses, in order to be eligible to graduate.

NO	CODE	COURSE	TICK (/) IF PASSED
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 EngineeringProfessionals	
6	GLRT0060	Safety and Health Officer Introductory Course	
7	GLRT0070	Industrial Machinery and Lubrication	

ACADEMIC PROGRESS

No	Session (Semester)	GPA	CGPA	Remarks
1	2024/2025(1)			
2	2024/2025(2)			
3	2025/2026(1)			
4	2025/2026(2)			
5	2026/2027(1)			
6	2026/2027(2)			
7	2026/2027(3)			
8	2027/2028(1)			
9				
10				



COURSE SYNOPSIS

SKEE 1012: Introduction to Electrical Engineering
This course serves as a general introduction to electrical engineering programmes offered by the Faculty of Electrical Engineering, UTM. Students undertaking this course will be exposed to attributes of electrical engineers from both academic and practical points of view. Soft skills and knowledge that are necessary in the engineering world will be introduced to the students. The students will have a clearer understanding of the responsibilities of electrical engineers to society. By exploring contemporary issues, the students would be able to suggest sustainable solutions to mankind and its environment.

SKEE 1013: Electrical Circuit Analysis
This course introduces students to the basic laws, methods of analysis and theorems for direct current, DC and alternating current, AC circuit, such as Ohm's Law, Kirchhoff's Current and Voltage Laws, Mesh and Nodal Analysis and Thevenin's and Norton's Theorems. Based on these, the students are expected to be able to solve for variables in any given DC and AC electric circuits. The students were also exposed to the steady-state electrical circuit. Afterwards, the relevant concepts in transient circuit analysis for first and second order circuits are taught to the students. With the knowledge learned, the student would be able to apply the basic laws, theorems and methods of analysis for solving completely with confidence various problems in circuit analysis.

SKEE 1033: Scientific Programming
This course introduces the fundamentals of scientific programming languages and techniques used by engineers to solve engineering problems. Students will be introduced to common scientific programming languages and their comparative advantages and disadvantages. Emphasis is placed on fundamentals of programming, program design, verification and visualization. The goal is to provide the students with the skills in scientific computing, tools, techniques that can be used to solve their own engineering problems. Students will learn to implement algorithms using high level programming language. The programming skills acquired in this course will allow students to go beyond what is available in pre-packaged analysis tools, and code their own custom data processing, analysis and visualization for any engineering problem. Students also will be introduced to create scientific documents using LaTeX programming language.

SKEE 1233: Digital Electronic Systems
This course teaches the principles of digital systems. From signal concepts and number systems and codes, it proceeds to logic gates, their relationship to Boolean algebra, logic simplification, and the integration of gates to form digital circuits for medium-scale integration, arithmetic logic, registers, and counters. It covers combinational and sequential logic circuits, including finite state machines, emphasizing circuit design and analysis. This course uses an industry-standard engineering software tool to design and simulate digital circuits.

SKEE 1103: C Programming for Engineers
This course introduces students to basic programming concepts and problem-solving techniques, with an emphasis on embedded systems. The course begins with an introduction to computer structures, before moving on to C programming concepts (editing, compiling, and debugging). Programs will be modeled with high level programming constructs (sequence, selection, looping) along with design tools (pseudocode and flowchart). Students will apply these ideas to arithmetic expressions, bit manipulations, arrays, strings, pointers, user-defined functions, and basic C library functions. By the end of the course, students should be able to run simple input/output demonstration programs on a single board computer to show their understanding.

SKEE 1073: Electronic Devices and Circuits | Pre-requisite: SKEE 1013 Electrical Circuit Analysis
This course provides introduction to the basic operating principles and applications of discrete electronic devices and circuits. The course content starts with the fundamental solid-state principles and continues the discussions with the constructions and characteristics of diode, Bipolar Junction Transistor (BJT) and Enhancement Metal Oxide Semiconductor Field Effect Transistor (E-MOSFET). The application of diodes focuses on the basic power supply circuits whereas the applications of the transistors focus on the small signal amplifier. The course content ends with an introduction to the operating principles of an ideal operational amplifier (op-amp) and discussion about op-amp circuits, performance and applications. To help the students understand the behavior of the electronic devices and predict the behavior of the electronic circuits, this course makes use of simulation software. The goal of this course is to develop excellent understanding of the devices operation for students to be applied in analogue circuit design.

SKEE 2133: Electronic Instrumentation and Measurement
This course introduces students to some of the metrological terminologies used in experimental methods, concept of metrology and its applications. The course will also provide the students with an understanding on the concept of electrical measurement quantity using analogue and digital instruments. The interfaces of the instruments with embedded sensors and also the acquired signal quality analysis is introduced. Besides that, this course also introduces the type of electrical noise and the ways to reduce noise and interference. Finally, the fundamental principle of transducers, transducer operations, characteristics and functions will be discussed. P&ID diagram will also be introduced. This course includes hands-on activities using the latest embedded system related to electrical and electronic measurement.

SKEE 2073: Signal and Systems
This course introduces the students to 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.

SKEE 3223: Microprocessor |Pre-requisite: SKEE 1223 - Digital Electronic Systems
This course introduces the principles and applications of microprocessors. Topics emphasized are processor architecture, assembly and HLL language and fundamentals of interfacing in a microprocessor-based embedded system. This course emphasizes on understanding the fundamentals of microprocessor operation, writing coherent and error-free assembly and HLL language programs, and designing basic interfacing circuits. With the knowledge learned, the student would be able to design microprocessor-based systems using assembly language and HLL programs completely with confidence.

SKEE 2433: Principles of Electrical Power Systems
This course introduces fundamental concepts of power systems, magnetic circuits and transformer. Students should be able to identify components of the system from the course and describe their basic operations from the course having electromagnetic and circuit concepts learned in previous fundamental courses. These fundamental concepts are further elaborated in applications of magnetic circuits in transformers, power in ac circuits, three-phase system, power system generation and component modeling and analysis in power system transmission. At the end of the course, the students are expected to critically analyze the power system comprising of generation and transmission.

SKEE 3263: Electronic Systems| Pre-requisite: SKEE 1073
This course covers some topics in functional electronic circuits. The circuits are derived from a diverse electronic circuitry that exists in many electronic instrumentations. The function, the behaviour and the characteristics of the functional circuits are analysed. Design examples are presented to guide students with the necessary knowledge of how to design the functional electronic circuits based on certain predetermined specifications.

SKEE 2752: Electronic Design Laboratory
In this course, the students will attend four 2nd year laboratories namely Electrotechnic, Basic Electronic, Digital Electronic and Instrumentation Laboratories. The students will attend a three-hour lab per week. The students are expected to complete 3 experiment topics for each lab in three weeks. In total, the student will perform 12 experiments. All experiments in the laboratories are emphasized on the design case for a given complex engineering problem or project. The students will use appropriate software simulation tools to assist them during the design process.

SKEE 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 summarized via 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.

SKEE 3133: System Modelling and Analysis
This course introduces the students to the fundamental ideas and definitions of control systems, open loop and closed 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 techniques of analyzing control systems performance and stability in the time domain. Finally, to simulate the stability and performance of the systems using software tools.

SKEL 3233: Digital Signal Processing
This course introduces concepts in digital signal processing. Continuous-time signals and systems will be reviewed. Consecutively, introduction to digital signal processing, the basic idea, benefits, and applications are presented. Discrete-time signals and systems are described based on signal definition, periodicity, stability, causality, convolution, difference equations, infinite impulse response (IIR), finite impulse response (FIR) and signal flow graphs. Spectrum representation of discrete-time signals will cover sampling theorem, the discrete- time Fourier transform (DTFT) and its properties, Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT). Another domain presented is z-transform, which consists of topics on derivations, the region of convergence, transformation properties, poles and zeros, and inverse z-transform. At the end of the course, analysis and design of digital filter cover filter basics, analog filter prototypes, and design of IIR and FIR filters.

SKEE 3143: Control System Design
The course begins with the root locus designs using root locus procedures and MATLAB. Then, PID controller will be designed using the root locus approach. The PID controller and lead-lag compensator will be used to improve the transient and steady state performances in the time domain using root locus approach. In frequency domain approach, the Bode plot method will be utilised. The lead, lag and lead- lag compensators are used in improving the performance of the control system using the frequency domain approach. Finally, applications of control engineering in various fields will be studied.

SKEE 3533: Communication Principles
This course introduces students to the basic principles of communication systems. The fundamental concepts of analogue modulation in particular amplitude and frequency modulations will be covered. 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 signal to noise ratio (SNR) and bit error rate (BER) will also be covered, as well as studied methods to utilize the communication resource efficiently (e.g., multiplexing, multiple access). The course will utilize parts of the Ericsson Educate initiative learning materials, and/or feature invited industry speaker(s). At the end of the course students should be able to explain, evaluate and solve problems related to communication systems.

SKEE 3732: Common Third Year Laboratory
Third Year Laboratory is a required course for third year students in Bachelor of Engineering degree program. This course requires students to conduct twelve experiments in four different laboratories (Basic Power, Basic Communication, Instrumentation, Microprocessor). The students are grouped into 3-4 students. Each week, they are required to conduct an experiment in the lab within 3 hours. Each group will submit only one short report at the end of each lab session. Each student is assigned to write only one long report based on one experiment that they have conducted for this course. This long report should be submitted within a week after the student performed the assigned experiment.

SKEE 3733: Integrated Design Project | Pre-requisite: SKEE 3732 (Common 3rd Year Lab)
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 an engineering project conducted in a small team (typically three or four students) under the supervision of an academic staff and with an optional industry partner as advisor. Topics supplementing this course that include project management tools and practices, organizational structures, engineering standards as well as the social and environmental responsibility of professional engineers are covered in the Professional Ethics and/or Engineering Management courses offered prior to or concurrent with the course. The project produced from this course needs to address one or more relevant Sustainable Development. Goals such as good health and well-being, quality education, industry, innovation and infrastructure depending on the nature of the project.

SKEL 3383: RTL Design | Pre-requisite: SKEE 1233 (Digital Electronic Systems)
This course introduces students to the use of computer-aided-design (CAD) tools and hardware description language (HDL) for the design of complex digital systems. Students will use CAD tools to model, design, analyze, synthesize, implement, and verify systems that are specified using the Register Transfer Level (RTL) methodology. Systems verification methods using scripts and testbenches will be introduced. Memory controller design and interfacing will be covered, including the use of RAMs, ROMs, Fifos, and external memory.

SKEE 3742: Specialized Third Year Laboratory
The 3rd Year Specialised Laboratory is a required course for third year students in the Bachelor of Engineering degree program. This course requires students to conduct four experiments in four different laboratories depending on their degree major and electives. This laboratory is conducted as a Project Based approach. The students are grouped into 3-4 students, and they will be given problems to solve that require them to conduct experiments in-lab (3 hours/week) and out-of-lab (equivalent to 2 hours/week) within three weeks. The students are required to solve the given project as a team, design suitable experimental procedures and conduct the experiments, design suitable experimental procedures and conduct the experiments, present the problem solutions and submit a report following a standard journal format.

SKEE 3925: Industrial Training
Students will undergo an industrial training lasting for 12 weeks at an approved private, government or semi-government agency. Placement at the respective agencies will be initiated by the applications from the students. Approval of the application is at the discretion of the Faculty. Undergraduates are expected to acquire hands-on experience not only in the engineering aspects of work, but also to other related matters such as administration, accounting, management, safety, etc. during the industrial training period. Industrial Guidance, Independent and Dependent Learning discrete implementation can make this course a work based learning course.

SKEE 4542: Engineering Management Principles
Today's technological society is constantly changing and with the change comes a need for the engineer to be able to address the technological societal challenges and opportunities for the future. Engineers are a key element today in the role to maintain technological leadership and a sound economy while the world becomes flatter in today's global economy. To do this the engineer needs to remain alert to changing products, processes, technologies, and opportunities and be prepared for a creative and productive life and position of leadership. This course introduces the engineer to the ways in which principles of management, project management and financial management have been and are applied in the kinds of work they are almost likely to encounter. Today these principles are needed by the engineering manager and those they manage. The basic outline of the course looking at the four main management functions followed by the functions of project management. Finally, the course further discusses on financial management in achieving organization goals and objectives efficiently and effectively.

SKEE 4813: Methodology of Research and Development
This course introduces the scientific method for conducting research and development projects, particularly in electrical engineering (EE). It covers topics such as problem formulation and objective, literature review, research methodology and design, data collection and analysis, research management and ethics. It also emphasizes technical writing skills for scientific publications, research proposals and thesis. The main objective is to equip the students with a solid background of methods to plan and conduct research and development projects, which will benefit their undergraduate final year project. The general principles of this course are applicable to other disciplines besides EE.

SKEE 4012: Professional Engineering Practice
This course introduces and exposes the students to the concepts, theories, and practice of Professional Engineer. It highlights the works of professionals in engineering, relevant acts and regulations, engineering code of ethics, engineers' roles and responsibilities, engineering ethics, the impact of the work of engineers on society, and knowledge to cater the needs for sustainable development. In terms of knowledge of accreditation of engineering programmes, the internationalization of engineers and sustainability, elements of EAC, Washington Accord and the UN's sustainable development goals (SDGs) are also discussed. Based on this knowledge, the students will work on projects to analyze real engineering issues and cases, both individually and in groups.

SKEE 4826: Final Year Project
This course introduces the scientific method for conducting research and development projects, particularly in electrical engineering (EE). It covers topics such as problem formulation and objective, literature review, research methodology and design, data collection and analysis, research management and ethics. It also emphasizes technical writing skills for scientific publications, research proposals and thesis. The main objective is to equip the students with a solid background of methods to plan and conduct research and development projects, which will benefit their undergraduate final year project. The general principles of this course are applicable to other disciplines besides EE.

SKEL 4743: Basic Digital VLSI Design | Pre-requisite: SKEE 2263
This course aims to introduce students to basic techniques to design and implement VLSI circuits. This course introduces students to VLSI technology. A historical perspective on the evolution of integrated circuit technology is covered. Important issues when designing a VLSI circuit are discussed. MOS transistors are studied in detail, including their characteristics, structure, switch-level behavior, and current equation. SPICE model of a MOS transistor is also described. The simplest circuit, an inverter, is studied in detail. Its voltage-transfer characteristic, noise margin, and how to control the inversion point are investigated. Fabrication processes are elaborated. Layout, design rules, and stick diagram are explained. Several logic families will be introduced. The advantages and disadvantages of each logic design style are explained. Delay and power performance of each logic family are also compared. Latch and flip-flop circuits are also covered. Interconnect issues, when various components are connected, are elaborated. To gain a better understanding of a complete design, a subsystem design in the form of adder circuits are included.

SKEL 4373: IC Testing Techniques
This course introduces students to the techniques of testing a digital circuit and designing a testable digital circuit. Several fault models including a single stuck-at fault model will be analyzed in detail. Fault simulation methods are covered as well in this course. Test pattern generation and design-for-testability are also introduced to students. In order to facilitate the learning process, computer-aided design (CAD) software is used throughout the course. Some practical or almost actual environmental problems and solutions are provided.

SKEL 4293: Advanced Digital Signal Processing
This course introduces advanced concepts in digital signal processing. In the beginning, basic concepts in signal processing will be reviewed that cover continuous and discrete-time signals and systems with the relevant transformations and operations. Then, random signal principles are presented with the definition of stationarity and ergodicity, correlation and covariance functions, and their estimates. Cross-correlation function and autocorrelation are used to construct linear systems with random inputs. The solution to the normal equation is used to model and predict the linear system, and the Levinson-Durbin method is used to implement the solution efficiently. Examples of optimal filtering methods applications like the matched and Wiener filters are shown. Signals' power spectrum is defined along with how it relates to the correlation function. The necessary solutions to the fundamental restrictions of nonparametric power spectrum estimation are provided. Towards the end of the course, signal analysis and representation techniques for time-varying signals are presented, such as the short-time Fourier transform, Gabor transform, and wavelet transform.

SKEL 4333: Computer Architecture and Organization
This course introduces students to the fundamental principles of computer architecture and its organization, emphasizing basic hardware/software components and functional architectures of computers. Computer organization and architecture is concerned with the structure and behavior of the various functional modules of the computer; and how they interact to provide the processing needs of the user. In particular, this course covers computer systems ranging from PCs through multiprocessors with respect to hardware design and instruction set architecture. This includes main memory, caches, central processing unit, and pipelines.

SKEL 4363: Digital 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 means 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. Computer Software will be used extensively for better understanding. By adapting this knowledge, students will be able to develop essential technical skills in solving real-world problems involving image processing with some degree of accuracy.

SKEL 4283: Analog CMOS IC Design | Prerequisite: SKEE1073
In this course students will be taught the characteristics of a MOSFET transistor as a prerequisite of CMOS analog design. It highlights the nonlinearity as an imperfection, which will limit the performance of analog circuits. The course will then proceed to analyze CMOS single ended as well as differential amplifiers. The trademark of analog design, which is the design challenge to fulfill design matrix, will be highlighted. Students will be guided on design principles to meet design specifications with acceptable accuracy. Op Amp design will be addressed towards the end of the course.

SKEL 4663: Embedded Processor System
This course is about microprocessors in embedded systems. This course extends the students' knowledge of microprocessors by investigating embedded systems design and state-of-the-art 32-bit embedded processors. The student will be familiarized with problems associated with producing hardware and software in high-level language. The topics covered include high-level programming for SoC, achieving high-performance in embedded systems through multi-threading over multi-core processors, code optimization, power management and operating system fundamentals. This course has a strong emphasis on hands-on hardware/software development, whereby the student will have to develop a solution on the test development board.

SKEL 4673: DSP Architectures
Pre-requisite: SKEL1233 Digital Electronic Systems, SKEL3233 Digital Signal Processing
This course introduces students to the FPGA implementation of digital signal processing (DSP) systems using the high-level synthesis (HLS) design methodology. The course utilizes Xilinx Vivado HLS with design specifications in Python and C/C++, synthesis to RTL, and C/RTL co-simulation. DSP algorithms covered include FIR and IIR filters, discrete and fast Fourier transforms, sparse and regular matrix multiplications, as well as prefix sum and histogram generation. For these algorithms, baseline implementation and optimization methods are introduced with analysis for performance, power, and area.

SKEL 3613: Semiconductor Material Engineering
This course introduces students to the characteristics, operation, and limitations of semiconductor devices. In order to gain this understanding, it is essential to have a thorough knowledge of the basic physics and operation of the semiconductor material. The goal of this course is to bring together crystal structures, quantum mechanics, quantum theory for solids, semiconductor material physics, and the fundamentals of pn structures. At the end of the course
student should understand the operation of present day and future electronic devices.

SKEL 4613: Semiconductor Device Engineering
The objective of this course is to provide students the physical principles underlying semiconductor device operation and the application of these principles to specific devices. Semiconductors form the basis of most modern electronics systems. It also provides a basis for understanding the characteristics, operation, and limitations of semiconductor devices. It is essential to have a thorough knowledge of the physics of the semiconductor material. The goal is to bring together quantum mechanics, the quantum theory of solids, semiconductor material physics and semiconductor device physics. All of these components are vital to the understanding of both the operation of present day devices and any future development in the field. By adapting this knowledge, students will be able to develop the required technical skills in solving problems that arise from scaling down of semiconductor devices and in designing new device structures to overcome the challenges. This course is a continuation to Semiconductor Material Engineering course and focuses more on basic and advanced devices.

SKEL 4623: Solid State Electronic Device | Pre-requisite: SKEL 3613 Semiconductor Material Engineering
The course introduces the basics of semiconductor hetero-structures and their applications in various solid state electronic devices. This is a continuation of the Semiconductor Material Engineering course and Electronic Devices course. Application of hetero-structure made from compound semiconductors and alloy semiconductors in transistor improves the transistor performance. The hetero-structure also enables the realization of solid state photonic devices such as LED, laser and solar cell. The hetero-structure application of solid state memory is presented in the last chapter.

SKEL 4633: Microelectronic Device Fabrication and Characterization
The objective of this course is to introduce students to the basics of semiconductor fabrication and characterization techniques that are relevant for microelectronic devices. The course will focus on the basic physical phenomenon and underlying technologies that are involved in each fabrication process, with an emphasis on modern silicon-based microelectronic device process flow. For device fabrication, students are exposed to mainly the top-down approaches which include wafer preparation, pattern transfer and doping technologies. For device characterization, basic electrical and optical techniques as well as physical characterization using microscopy technologies will be described.

SKEL 4683: Nanoelectronics Materials and Applications
Pre-requisite: SKEL 4613 Semiconductor Device Engineering
The purpose of this course is to develop appreciation and understanding for the conceptual foundation of nanotechnology as enabling sciences and technology in the field of nanoelectronics. The goal of this course is to bring together fundamental concepts in crystal structures, quantum mechanics and nanomaterials that include organic and inorganic materials to apply in low dimensional semiconductors and their applications. In addition, recent related monolayers, heterojunction materials and recent progress in Field Effect Transistors (FET) are discussed. All of this knowledge is significant for students to comprehend the theoretical and practical challenges in designing future nanoelectronic devices from More than Moore to More Moore applications.

SKEL 4653: Modelling and Simulation of Microelectronic Devices
This course introduces students to modeling and simulation of microelectronic devices. Today, computer-aided design has become an affordable and in fact necessary tool for designing contemporary devices. The purpose of this course is to provide fundamental device modeling techniques with emphasis on the silicon metal-oxide-semiconductor field-effect-transistor (MOSFET). Examples of modeling carbon-based materials such as carbon nanotubes and graphene are also explored. There are discussions on crystal structure of solid, quantum system, carrier transport properties in 3D, 2D and 1D systems. At the end of the course students should have fundamental concepts and basic tools for transistor-level simulation that can be enhanced for circuit simulation.

SKEL 4213: Software Engineering
This course introduces the theoretical principles and practical aspects of large scale software development. The theoretical principles covered include understanding customer requirements, software development process, program design, collaborative development and testing. The practical aspects covered include Linux, Python and version control. Emphasis is given to object-oriented analysis and design (OOAD) as well as the use of UML in the design activities.

SKEL 4343: Information Security
This course covers the basic principles and techniques used to protect information. The area covered begins with description of the various structures of communication systems in practice today, security architecture and models, issues related to legislation and ethics, and physical security. Consequently, the course will cover areas applicable to electronic and communication security with description of the various types of cipher systems followed by its use in authentication. Finally, applications in telecommunication, network and the internet are demonstrated.

SECR 2043: Operating System
This course covers introduction to operating systems, which serve as an interface between computer hardware and the user. The operating system is responsible for the management and coordination of processes, sharing of limited resources of the computer. Students will be exposed to the techniques and algorithms that may be applied in designing an operating system. Topics covered include process management, concurrency and synchronization, deadlock, memory management, file management, secondary storage management and I/O management. At the end of the course, the student shall have a clear understanding of the general concepts that underlie an operating system.

SKEM 4173: Artificial Intelligence
Artificial intelligence (AI) involves the development of algorithms derived from human and animal intelligence that have capabilities such as learning, reasoning, generalization, adaptation, reproduction, etc. Nowadays, these techniques are getting popular due to the large number of successful reports of implementations. AI techniques have also made their way into many domestic and industrial products and provided solutions to many difficult engineering problems. In this course, students are exposed to several AI techniques i.e. Artificial Neural Network (ANN), Fuzzy Logic, Machine Learning (ML), Deep Learning (DL) and optimization methods (such as Genetic Algorithm (GA) and Particle Swarm Optimization (PSO)), and how they are used as a stand-alone approach or in any combination of the methods in solving engineering and non-engineering problems.

SKET 3623: Data Communication and Networks
The objective of the subject is to enhance the students' knowledge on data communication and computer networks. It explains the basic process of data communication, protocol, interfacing, and interworking between computer
networks and switching components in telecommunication systems. At the end of the course, the students should be able to understand the system used in representation, distribution, transmission, and reception of data in data communication networks.

SKEB 3503: Physiology and Introduction to Medicine
The course is designed for students with engineering and technical background as an introduction to the basics of physiology and anatomy of the human body system. The course includes discussions on common physiological & anatomical disorders and the relationship among different body systems in maintaining homeostasis. The course aims to prepare students for meaningful interaction with medical practitioners when performing medical-related work or collaborative research.

SKEB 3043: Instrumentation and Measurement in Biomedical
This course introduces how electronic circuits and systems are used in the design of biomedical
measurement systems and biomedical instrumentation design. The architecture of electronic instruments used to measure physiological parameters, and the use of electrodes and transducers are addressed, as well as the analysis of major process functions integrated in these instruments. Four main focused instruments are ECG, EMG, PPG, and Respiratory.

SKEB 3423: Clinical Engineering 1
This course introduces students to the concept of healthcare institutions, its functions, scope of services, specialty disciplines of medicine and common medical devices used in those specialty disciplines. They will also be exposed to principles of clinical engineering as a subspecialty of biomedical engineering and clinical engineer's role in supporting healthcare institutions. Other than that, principles of operation of selected medical devices, its maintenance requirements and common problems will also be discussed in the course.

SKEB 4023: Biomedical Signal Processing
Manual analysis of biomedical signals has many limitations and is very subjective. Therefore, computer analysis of these signals is essential since it can provide accurate and permanent records of diagnosis as well as quantitative measurement. Hence, this course presents methods of digital signal processing for biomedical signals. The course will discuss the fundamental and current approach of biomedical signal processing. Among biomedical signal processing algorithm covers in this course are: Fourier analysis, Fourier transform, data acquisition, digital filter design and discrete Fourier transform. Furthermore, few current approaches on biomedical signal processing techniques were also introduced: instantaneous energy and frequency, short-time Fourier transform, wavelet transform and time-frequency analysis.

SKEL 4543: Biosystem Modelling
The objective of this course is to introduce students to the mathematical model, methods and their biological application, and model of subsystems in the human body. This course introduces students to some major views and theories in modeling the subsystem in the human body. It is almost impossible to cover all subsystems in the 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 course will also provide practice in carrying out a computer simulation and modeling of a bio system using Octave/SCILAB/MATLAB/Simulink/LabView software.

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

SKEL 4563: Biosensors and Transducers
This course is intended to provide a broad introduction to the field of biosensor and transducer in the bioelectronics industry. Fundamental applications of biosensor theory are discussed, including biorecognition, transduction, and signal acquisition/processing. Design and fabrication of different types of biosensor are explored, ranging from electrochemical to optical systems. Discussions on the current state of the art biosensor technology to enable continuation into advanced/future biosensor and the applications in biomedical, bioenvironmental, food safety, and biosecurity are given.

SKEB 3313: Biomedical Materials
This subject provides an introduction to the fundamentals of 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 describe the chemistry and physic of biomaterials, their biocompatibility and the consequences of implantation of the devices, made of these materials, into the human body. The subject is also designed to expose the students with the failure of materials through fracture, fatigue, wear and corrosion. At the end of the subject, an act covering the cleansing management and disposal of waste biomaterials will be delivered to the students.

SKET 3573: Microwave Engineering
To introduce the basic theory of Microwave Engineering, such as transmission line theory, scattering parameters, Smith Chart, and impedance matching. Fundamental microwave devices, such as waveguides and resonators are explained. The students are also introduced to passive and active microwave components such as terminations, couplers, power dividers/combiners, circulators, amplifiers, oscillators, traveling wave tubes, filters, and microwave solid-state devices. Fundamentals in microwave instruments and measurement techniques are introduced.

SKET 3583: Digital Communication Systems
This course introduces the fundamental concepts in digital communication systems. Main topics to be covered are information theory, baseband transmission, detection methods, signal space analysis, digital modulation and channel coding. The system tradeoffs in designing a digital communication system will also be discussed.

SKET 4523: Optical Communication Systems
This course will provide students with an understanding of optical communication systems. The first part of this course will review basic properties of light, fibers and waveguides. In this part, the emphasis is on the fiber transmission characteristics such as attenuation, absorption, scattering, dispersion and fiber bending loss which influences optical communication system performances. The second part of this course will cover light sources and detectors used in optical transmitter and receiver systems. Basic principles of Light Emitting Diode (LED) and laser as optical sources, and its suitable power launching and coupling technique will be discussed. As for the detectors, p-n junction photodiode (PN), positive-intrinsic-negative photodiode (PIN) and avalanche photodiode (APD) will be covered to gain understanding on receiver performance issues including noise, sensitivity and bandwidth. The last part of this course will introduce students to optical link power budget and rise time budget analysis as a guideline in designing optical communication systems.

SKET 4533: Wireless Communication Systems
This course introduces students to the concepts and principles of mobile radio as well as satellite communication systems. Topics covered include mobile radio propagation, multiple access, cellular concept, modern wireless communication systems plus operation and subsystems of satellite communication. The course will utilize parts of the learning materials and/or feature invited speaker(s) from the Ericsson Educate initiative.

SKET 4543: RF Microwave Circuit Design
This course introduces students to the concept of designing RF/Microwave circuits in wireless communication systems such as filters, amplifiers, oscillators and mixers. The design of the RF/Microwave circuit is based on the discrete components and the S-parameter of the component. The system block diagram is also discussed such as transmitter and receiver function and noise in the communication system. The filter design is based on the lump component and the response of the filter such as Butterworth and Chebyshev response. The matching concept is discussed further in the RF/Microwave amplifier and oscillator design using Smith chart. The analysis of the different mixers is also discussed in this subject. Microwave simulation software will also be introduced to facilitate the learning process.

SKET 4593: Acoustic Engineering
This course embodies the basic principles of fundamentals of acoustics engineering. The aim is mainly to instill confidence and apply the basic concepts, theories and applications in acoustics, noise control, room acoustics and sound system design. The course provides an in-depth understanding of the characteristics, propagations, transmission and attenuation of sound waves. Further, noise criteria and control of interfering noise, sound absorption and reflection shall follow. The last part of the course covers good room acoustics and sound system design for an enclosed room. At the end of the course, the students shall be able to apply the acoustics engineering fundamentals and concept in designing enclosed rooms for optimum acoustics and sound system.

SKET 4613: Antenna Theory and Design
This course introduces students to the concept of antenna, theory and design in a telecommunication system. The basic antenna properties such as gain, polarization, directivity, efficiency, and radiation pattern for various types of the antenna will be discussed. Several antennas with specific characteristics will be designed using simulation software and analyzed. Finally, the antenna measurement setup is introduced and discussed.

SKET 4623: Network Programming
The aim of this course is to familiarize students with the fundamentals of network programming within networking contexts. Through this course, students will gain insight into socket programming for establishing connections between computers or devices in a network. The module will cover topics such as treads, input-output streams, handling errors and exceptions, multi-threading and security in socket programming. Upon completion of the course, students will be able to interface between clients and servers and perform network analysis.

SKET 4643: Optical Materials and Sensors
The aim of this course is to introduce students to the theories, concepts, instrumentation and device design for optical sensors. At the beginning, the course prepares students with essential knowledge of materials including the electric, thermal, magnetic and optical properties. The topics are established from the fundamental knowledge of materials science. Afterward, it explores various classification of optical sensors, their configurations and operation principles. Finally, students are exposed to the design process of optical sensing devices for specific sensing applications.

SKET 4663: Optical Network
This course covers the basic aspects of optical networking, which is the key for today's high speed data transportation technology. The course introduces several important optical transmission properties (e.g., fiber propagation and nonlinear effects) and optical network components (e.g., transmission devices and WDM network devices) that support the provisioning of high-speed lightpaths between optical nodes. The course also highlights approaches for ensuring the survivability of provisioned lightpaths (e.g., via protection and restoration schemes), and metrics for analyzing the topological properties of optical networks. At the end of the course students should be able to explain, evaluate and solve problems related to the principle of optical networking, survivable lightpath routing and network topology.

SKEE 4513: Special Topic in Electrical Engineering
The Special Topic in Electrical Engineering course offers an in-depth exploration of emerging and advanced concepts within the electrical engineering field which will be taught by the visiting professor. This course is intended for students with a solid foundation in electrical engineering principles and looking to expand their knowledge in specific areas of interest. It is designed to allow students to explore specialized areas of electrical engineering beyond the scope of the regular curriculum. This course aims to foster critical thinking, problem-solving skills for complex
engineering problems, and an understanding of cutting-edge technologies shaping the future of electrical engineering. All these components are vital to understanding the operation of present day devices and any future development in the field. At the end of the course, students will be prepared for further research, industry positions, or advanced studies in electrical engineering.

SKEL 5113: Advanced Nanoelectronics Devices
This course introduces students to the semiconductors form the basis of most modern electronic systems. This course is designed to provide a basis for understanding the characteristics, operation, and limitations of semiconductor devices. In order to gain this understanding, it is essential to have a thorough knowledge of the physics of the semiconductor material. At the end of the course, students should understand how to bring together quantum mechanics, the quantum theory of solids, semiconductor material physics, and semiconductor device physics. All these components are vital to the understanding of both the operation of present-day devices and any future development in the field.

SKEL 5123: Advanced Microprocessor System
This course is about microprocessors in embedded systems. This course extends the students' knowledge of microprocessors by investigating embedded systems design and state-of-the-art 32-bit embedded processors. The student will be familiarized with problems associated with producing hardware and software in high-level language and assembly language for embedded systems. The topics covered include high-level (C/C++ programming) and assembly language programming for embedded microprocessors, memory and peripherals for embedded systems, system development, embedded real-time operating systems and optimizing performance of embedded systems.

SKEL 5173: Advanced Digital System Design
This course is designed for students to learn and be able to design and verify complex digital synchronous systems - towards becoming an RTL digital hardware designer in industry. This is a course that goes beyond the introductory course on digital basic principles and techniques. This course introduces digital circuit modeling with hardware description languages (HDLs), which is the key technique to modern design of integrated circuits (ICs). The technique involves a CAD approach in which a high-level, text-based, abstract description of the circuit is created, then synthesized to a hardware implementation in a selected technology, and finally verified for its functionality and timing.

SKEL 5193: Advanced Analog CMOS IC Design
This course introduces students to the advanced level of CMOS design in analog circuits. In the beginning, it highlights the operational concept of MOSFET transistors and their nonlinearity characteristics that will limit the performance of analog circuits. The course will then proceed to analyze CMOS amplifiers, where the advantages and disadvantages between different architectures will be discussed. The trademark of analog design which is the design challenge to fulfill design matrix will be emphasized. Students will be guided on design principles to meet design specifications with acceptable accuracy. Important sub-modules that include differential amplifiers and op amps will be studied in detail towards the end of the course.

SKET 5313: Communication and Computer Networks
This course will enhance students' knowledge in communication and computer networks. It explains the advanced concept of transport and network layers, protocols, interfacing and interworking between computer networks and network devices in telecommunication systems. The students will be taught with the various possible techniques to understand the modern networks for wired and wireless services.

SKET 5423: Advanced Wireless Communication Systems
This course introduces students to advanced wireless communication system and technologies. Students will be presented with the concept of wireless communication systems and mobile radio propagation. Next, the course will describe cellular concepts that will include small cell networks. Students will then be exposed to multiple access techniques and MIMO technology. This is followed by reviewing the overall evolution and future trends of cellular communication systems. The course utilizes parts of the learning materials and/or feature invited speaker(s) from the Ericsson Educate initiative.

SKET 5513: Sustainable Design, Engineering and Management
The aim is to give students an insight and understanding of the environmental and sustainability challenges that are facing by engineers and how these have given rise to the practice of Sustainable Design, Engineering and Management. The objective of this course is to provide a comprehensive overview of the nature and causes of the major environmental problems facing our planet, with a particular focus on energy, life cycle and green technology. The students also will experience conducting case studies and project-based learning based on 4 themes in sustainability: connecting, conceptualizing, valuing and implementing.

SKET 5523: Internet of Things Technologies
Internet of Things (IoT) which includes its concept, architecture and applications. It also gives the underlying communication protocols and technologies. The course has a significant practical element that will be delivered during lab sessions in which students are expected to complete exercises involving system design, device programming and cloud development. To provide insights from an industrial perspective, the students will also be introduced to guest speakers from Ericsson, a leading multinational networking and telecommunication company, and its Ericsson Educate program modules. It is recommended for the students taking this course to have programming skills and knowledge on networking.

COURSE APPROVAL

MORE THAN 18 CREDITS

Students are **not allowed** to take more than 21 credit hours

APPROVAL FOR 21 CREDITS

PROF. DR. JAFRI BIN DIN — 21

Dean
Faculty of Electrical Engineering
jafri@utm.my

APPROVAL FOR 20 CREDITS

PROF. IR. DR. MUHAMMAD NADZIR BIN MARSONO — 20

Deputy Dean (Academic & Student Affairs)
Faculty of Electrical Engineering
mnadzir@utm.my

APPROVAL FOR 19 CREDITS (ACADEMIC ADVISOR & DIRECTOR)

ASSOC. PROF. TS. DR. SHAHRIN BIN MD. AYOB — 19

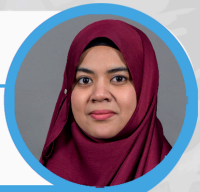
Director
Department of Electrical Power Engineering
e-shahrin@utm.my

PROF. IR. DR. RUBITA BINTI SUDIRMAN — 19

Director
Department of Electronic & Computer Engineering
rubita@utm.my

PROF. IR. DR. HAZLINA BINTI SELAMAT — 19

Director
Department of Control & Mechatronics Engineering
hazlina@utm.my



ASSOC. PROF. IR. TS. DR. ASNIDA BINTI ABDUL WAHAB — 19

Director
Department of Biomedical Engineering & Health Sciences
asnida.aw@utm.my

ACADEMIC STAFF
DEPARTMENT OF ELECTRONIC AND COMPUTER ENGINEERING

Prof. Ir. Dr. Rubita Sudirman | rubita@utm.my
Director

B. Sc. (Electrical , M. Sc. (Electrical)(Univ. of Tulsa, USA),
Ph. D. (Electrical)(UTM)
P. Eng., C. Eng., SMIEEE, MIET, MSET
Speech Recognition, Biomedical Signal Analysis, Medical Electronics

Prof. Dr. Syed Abdul Rahman Syed Abu Bakar | syed@utm.my
Deputy Dean (Research, Innovation and Development)

B. Sc. (Electrical Engineering)(Clarkson, USA),
M. Sc. (Electrical Engineering)(Georgia Tech., USA),
Ph. D. (Digital Image Processing)(Bradford, UK), SMIEEE.
Computer Vision, Image Processing, Dynamic Scene Analysis, Human Action Recognition, and Medical Imaging

Prof. Ir. Dr. Muhammad Nadzir Marsono | mnadzir@utm.my
Deputy Dean (Academic and Student Affairs)

B. Eng. (Computer), M. Eng. (Electrical)(UTM),
Ph.D. (Computer Engineering)(Univ. of Victoria, Canada),
C. Eng., P. Eng
Embedded Systems, Many-Core System-On-Chip, Network-On-Chip, Specialized Computer Architectures, VLSI Design, Network Processing and Internetworking, Network Algorithmics, Network Processor Architectures

Assoc. Prof. Ir. Dr. Ab Al-Hadi Ab Rahman | hadi@utm.my
Head of Research Group – VeCAD

B. S. (Computer Engineering)(Wisconsin Madison, USA),
M. Eng. (Electrical – Electronics & Telecommunications)(UTM),
Ph. D. (Microelectronics & Microsystems)(EPFL, Switzerland),
SMIEEE
FPGA/ASIC Design, Electronic Design Automation, Machine Learning, Video Coding

Assoc. Prof. Ir. Dr. Azli Yahya | azliyahya@utm.my

B. Eng. Hons (Electro-mechanical),
M. Sc. (Electronic Production)(Glamorgan, UK),
Ph. D. (Power Electronics)(Loughborough, UK),
P.Eng, C. Eng, MIET, MIEEE
Power Electronics, Machine Control, Microcontroller, Electrical Discharge Machining

Assoc. Prof. Ts. Ir. Dr. Eileen Su Lee Ming | eileensu@utm.my
Coordinator for Master by Research Programme (ECE)

B. Eng. (Electrical - Mechatronics), M. Eng. (Electrical)(UTM), Ph. D. (Bioengineering)(Imperial CollegeLondon, UK),
P. Eng., C. Eng., MIET.
Design of Medical Devices, Virtual Reality Systems, Surgical Simulators, Rehabilitation Robots, Haptics, Human Motor Learning and Assessment, Connected Healthcare Systems

Assoc. Prof. Ts. Ir. Dr. Michael Tan Loong Peng | michael@utm.my

B. Eng. (Electrical - Telecommunications), M. Eng. (Electrical) (UTM), Ph. D. (Electrical Engineering)(University of Cambridge, UK), P. Eng., P. Tech., C. Eng., SMIEEE, MIET, MIEM, MySET.
Semiconductor Material Engineering, Device Modelling of Low Dimensional Nanostructure, Device Simulation based on Tight-Binding

Assoc. Prof. Dr. Musa bin Mohd. Mokji | musamm@utm.my
Deputy Director (Academic Quality Monitoring) QRIM

B. Eng. (Electrical - Mechatronics), M. Eng. (Electrical), Ph. D. (Electrical Engineering)(UTM).
Digital Signal Processing, Image Processing

Assoc. Prof. Ir. Ts. Dr. Nasrul Humaimi Mahmood | nasrulhumaimi@utm.my
Coordinator for FKE Graduate Employability

B. Eng. (Electric, Electronic and System)(UKM),
M. Eng. (Electrical)(UTM),
Ph.D. (Electrical Engineering)(Warwick, UK).
Electronics, Medical Electronics, Image Processing and Rehabilitation Engineering

Assoc. Prof. Dr. Norlaili Mat Safri | norlaili@utm.my
Academic Coordinator for Advanced Electronic Laboratory

B. Electrical Engineering and Computer Science (Kumamoto, Japan), M. Eng. (Electrical)(UTM),
Ph. D. (Systems and Information)(Kumamoto, Japan)
Biomedical Signal Processing (EEG, EMG, ECG), Brain-Computer Interface

Assoc. Prof. Ts. Dr. Zaid Omar | zaidomar@utm.my
Head of Research Group – DSIP

B. Eng. (Computer)(UTM),
M. Sc. (Data Communications)(Sheffield, UK),
Ph. D. (Electrical Engineering)(Imperial College London, UK),
SMIEEE.
Computer Vision, Biomedical Image and Signal Processing

Ts. Ir. Dr. Fauzan Khairi Che Harun | fauzan@utm.my
Head of Research Group - BMiE

B. Eng. (Electrical - Electronics)(UTM), M. Eng. (Advanced Electrical Engineering), Ph. D. (Biomedical Engineering)(Warwick University, UK) Electronic Nose, Bio-Mimetic, Bio-inspired Instrumentation, Biomedical Instrumentation, Chemical Gas Sensor, ME

Dr. Amirjan bin Nawabjan | amirjan@utm.my
Coordinator for Industrial Training

B. Eng. (Electrical - Telecommunications), M. Eng. (Electrical – Electronics & Telecommunications)(UTM),
Ph. D. (Electrical & Electronic Engineering)(University of Southampton, UK).
Semiconductor Devices, Solar Cell, Silicon Devices, Thin Film Characterization

Dr. Fatin Hamimi binti Hamat @ Mustafa | fatinmustafa@utm.my

B. Sc. (Electrical Engineering)(UTM),
M. Sc. (Electrical Engineering)(UTM),
Ph. D. (Electrical Engineering)(Univ. of Sydney, Australia)
Medical Device Development, Biosensor Technology, Biomedical Signal Analysis, Monte Carlo Simulation

Dr. Ismahani binti Ismail | ismahani@utm.my
Internal Audit Committee

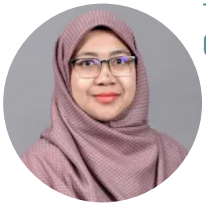
B. Eng. (Computer), M. Eng. (Electrical - Electronics & Telecommunications),
Ph. D. (Electrical Engineering)(UTM)
Digital System Design, Network Algorithmics

Mr. Izam bin Kamisian | e-izam@utm.my
Academic Coordinator for VLSI System Design Laboratory

B. Electrical Eng. (Microelectronics),
M. Eng. (Electrical)(UTM), MIEEE
Stochastic Computing, Analog CMOS VLSI, Digital VLSI IC Design & Test

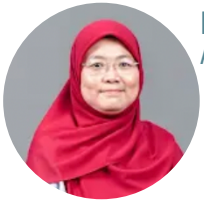
Dr. Jamaluddin bin Zakaria | jamaluddin.zak@utm.my
Coordinator for Course Files Management

B. Eng. (Electronic), M. Sc. (Electrical & Electronic),
Ph. D. (Electrical & Electronic Engineering)(USM), MIEEE
Physical-Layer Cooperative System, Electronic System Design



Ts. Dr. Mastura Shafinaz Zainal Abidin | m-shafinaz@utm.my
Coordinator for Chemical & Waste Management

B. Eng. (Electrical - Electronics), M. Eng. (Electrical - Electronics & Telecommunications), Ph. D. (Electrical)(UTM), MIEEE, Grad IEM Fabrication and Characterization of Semiconductor Devices, Compound Semiconductor Sensing Devices, Material Growth, Semiconductor Nanostructures and Thin Films



Dr. Mitra Mohd. Addi | mitra@utm.my
Academic Coordinator for Bioelectronics Laboratory

B. Eng. (Hons)(Electrical & Electronics)(Uni. Teknologi PETRONAS), M. Sc. (Bioengineering)(Strathclyde, Scotland), Ph. D. (Biomedical Engineering)(New South Wales, Australia), SMIEEE
Medical Electronics, Physiological Measurements & Processing, Engineering Education

Dr. Mohd Afzan bin Othman | afzan@utm.my
Academic Coordinator for Microprocessor Laboratory

B. Eng. (Computer), M. Eng. (Electrical - Electronics & Telecommunications), Ph. D. (Electrical Engineering)(UTM), MIEEE.
Biomedical Devices, Biomedical Signal Processing, EEG, ECG and EMG Analysis

Dr. Mohd Anuar bin Md Ali | mohdanuar.mdali@utm.my
Academic Coordinator : Digital Electronic Laboratory, FYP

B.Eng. (Electrical and Electronic),
M.Eng. (Electronics and Applied Physics)(Tokyo Tech),
Ph.D. (Microengineering and Nanoelectronics)(UKM)
MEMS/NEMS, Lab-on-Chip, Sensors & Actuators, Building Systems

Dr. Mohd Azhar bin Abdul Razak | mohdazhar@utm.my
Coordinator for 2nd Year Laboratory

B. Eng. (Electrical – Electronics)(UTM),
M. Sc. (Biomedical Engineering),
Ph.D. (Biomedical Microengineering)(Surrey, UK), MIEEE
Medical Electronics, Cell Analysis, Dielectrophoresis, Image Processing

Dr. Muhammad Afiq Nurudin bin Hamzah | mafiq@utm.my
Academic Coordinator : Computer System II Laboratory, CQI

BB. Eng. (Electrical - Electronics), M. Eng. (Electrical),
Ph. D. (Electrical Engineering)(UTM), MIEEE
Semiconductor Device Physics & Modeling, TCAD Simulation, Compact Modeling

Ts. Dr. Nor Aini Zakaria | norainiz@utm.my
Coordinator for 3rd Year Specialized Laboratory

B. Eng. (Electrical & Electronic)(Takushoku, Japan),
M. Eng. (Electrical - Electronics & Telecommunications)(UTM), Ph. D. (Electrical Engineering)(Nara Inst. of Sc. & Tech., Japan), MIEEE, IACSIT
GaitAnalysis, Medical Electronics, Rehabilitation Engineering

Dr. Norlina Paraman | pnorlina@utm.my
Program Coordinator for Master of Engineering (Computer and Microelectronic Systems)

B. Eng. (Computer), M. Eng. (Electronics & Telecommunications),
Ph. D. (Electrical Engineering)(UTM)
Design for Testability, Built-in Self-Test, High Level Verification

Ts. Dr. Nurul Ashikin Abdul Kadir | ashikin.kadir@utm.my
Coordinator for Capstone Project/ Integrated Design Project

B. Eng. (Electrical - Medical Electronics),
M. Eng. (Electrical),
Ph. D. (Electrical Engineering)(UTM), MIEEE, MIEM
Bio-Signal Processing (ECG, ENG, EEG),
Electronic Circuit, FPGA Prototyping, Speech Processing, Pattern Recognition

Ts. Dr. Nurul Ezaila Alias | ezaila@utm.my
FKE Coordinator for Final Year Project

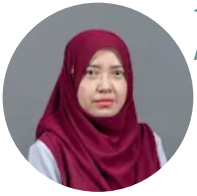
B. Eng. (Electrical - Electronics)(UiTM),
M. Eng. (Electrical - Electronics & Telecommunication) (UTM), Ph. D. (Electrical Engineering & Information System) (University of Tokyo, Japan), SMIEEE, Grad IEM.
Advanced TCAD of semiconductor devices, FET-based Memory Application, Variability and Reliability in Nanoscale FET Device

Dr. Shaharin Fadzli Abd. Rahman | shaharinfadzli@utm.my
Program Coordinator for Bachelor of Electronic Engineering with Honours

B. Eng (Electronics), M. Eng (Electronic for Informatics) (Hokkaido, Japan),
Ph.D. (Electrical Engineering)(UTM)
Semiconductor Device and Carbon Material Growth

Dr. Shahidatul Sadiah Abdul Manan | shahidatulsadiah@utm.my
Coordinator for IT Postgraduate

B. Eng. (Communication Network), M. Eng. (Electronic & Informatic System)(Okayama Univ., Japan),
Ph. D. (Informatic Engineering)(Hiroshima Univ., Japan)
Information Security, Cryptography, Computer Architecture



Ts. Dr. Suhaila Isaak | suhailaisaak@utm.my
Academic Coordinator for Nanoelectronics Laboratory

B. Eng. (Electrical - Microelectronics)(UTM),
M. Eng. (Electrical)(UPM),
Ph. D. (Electrical Engineering)(Nottingham, UK).
Photonic Device Fabrication, VLSI, Photon Imaging, Integrated Circuit Design

Ts. Dr. Suhana Mohamed Sultan | suhanasultan@utm.my
FKE Coordinator for Industrial Networking & International Relationship

B. Eng. (Electrical - Electronics)(UNITEN),
M. Sc. (Microelectronics)(National Univ. of Singapore),
Ph. D. (Electrical & Electronic Engineering)(Southampton, UK), SMIEEE, Grad IEM
ZnO/piezoelectric nanostructures, nanotechnology in environmental sensing, Carbon-based and Semiconductor Nanomaterials Device

Dr. Usman Ullah Sheikh | usman@utm.my
Postgraduate Academic Manager

B. Eng. (Electrical – Mechatronics), M. Eng. (Electrical - Telecommunications), Ph. D. (Electrical Engineering) (UTM), MIEEE, Grad. IEM, MIET
Digital Signal Processing, Image Processing, Computer Vision, Machine Learning, Pattern Recognition, Embedded Systems, Embedded Software

Dr. Yusmeeraz Yusof | yusmeeraz@utm.my
Manager for Quality & Strategy

B. Sc. (Electronic & Electrical Engineering), M. Sc. (Integrated Design Engineering)(Keio Univ.,Japan), Ph. D. (Electrical Engineering & Computer Science) (Nagoya, Japan).
IC Design, Microelectronics, Biosensor, DNA Chip

Ir. Ts. Dr. Zaharah Johari | zaharahj@utm.my
Head of Research Group - CONE

B. Eng. (Electrical - Electronics),
M. Eng. (Electrical - Electronics & Telecommunications),
Ph. D. (Electrical Engineering)(UTM),
SMIEEE, MIET, Grad IEM
Modeling and Simulation of Nanoelectronic Devices

Dr. Zulfakar Aspar | zulfakar@utm.my
Academic Coordinator for PCB Laboratory

B. Sc. (Electrical Engineering) CWRU, Ohio, USA,
M. Sc. (Electrical Engineering)(UTM),
Ph. D. (Electrical Engineering)(UTM)
PLC,LLD, Petri Net, FPGA, IC Design, verilog,image processing, Embedded system, AI, automation, robotic, compiler, and custom software solution

STAF (SKIM AMAL BAKTI)

Dr. Ahmad Zuri Sha'ameri | ahmadzuri@utm.my

B. Sc. (Electrical Engineering)(Missouri – Columbia, USA),
M. Eng. (Electrical), Ph. D. (Electrical Engineering)(UTM), SMIEEE, MIET.
Signal Theory, Signal Processing for Communication and Radar,
SignalAnalysis and Classification, Information Security
(Skim Amal Bakti 2024 –2025)

Hj. Muhammad Arif bin Abdul Rahim | arif@utm.my

B.Sc. (Electrical & Electronic Engineering), (University of Strathclyde, UK),
M.E.E (Electrical Engineering)(UTM)
Analog Electronic, Digital Electronic, VLSI Design
(Skim Amal Bakti 2024-2025)

ACADEMIC OFFICE
UNDERGRADUATE PROGRAM

P19a, Faculty of Electrical Engineering
Universiti Teknologi Malaysia
81310 UTM Johor Bahru
Johor, Malaysia

SUBSCRIBE

Linktree

undergraduate-office@fke.utm.my
ElectricalCircleUTM
https://linktr.ee/ugskeutm
+607-5557029 / +607-5557007

BIO-MEDICAL- ZULBAIDAH
ELECTRICAL - ARMANUSA
ELECTRONIC- NUR SHAZWANI
MECHATRONIC - ROGAYAH