UTHM
Universiti Tun Hussein Onn Malaysia

ACADEMIC PROFORMA

2026/2027



BACHELOR OF

ELECTRONIC ENGINEERING (SEMICONDUCTOR AND INTEGRATED CIRCUIT DESIGN) WITH HONOURS (BES)



FACULTY OF
ELECTRICAL & ELECTRONIC ENGINEERING
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Universiti Tun Hussein Onn Malaysia
August 2026

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Foreword by The Vice Chancellor



Assalamualaikum Warahmatullahi Wabarakatuh and greetings.

I extend heartfelt congratulations and a warm welcome to each of you as you embark on your academic journey with us. Your decision to join UTHM marks a significant milestone, and I am deeply honoured by your trust and commitment.

As an academic institution, we not only recognize the importance of the intertwined dimensions of economic, social, and sustainability (ESG) factors in the post-pandemic era but also embrace our responsibility to actively contribute to their advancement. Our commitment is unwavering as we strive to strengthen our core business pillar by focusing on various crucial aspects.

Firstly, we are dedicated to enhancing our academic delivery to ensure our students receive the highest quality education in today's rapidly evolving world. This commitment involves continually refining our curriculum, integrating innovative teaching methods, and cultivating critical thinking skills. Our aim is to equip students with the knowledge and capabilities needed to effectively address complex societal challenges. Secondly, we place significant emphasis on research efforts that contribute to sustainability objectives. By fostering a culture of interdisciplinary collaboration, we strive to generate pioneering research and innovative solutions that tackle pressing economic, social, and environmental issues. Our goal is to make meaningful contributions to the sustainable development of both local and global communities.

In addition to our core priorities, we actively enhance our impact by engaging with diverse stakeholders. Through partnerships, community outreach programs, and knowledge exchange initiatives, we aim to extend our positive influence beyond our institution. By leveraging our expertise and resources, we seek to address societal needs, promote inclusive growth, and enhance well-being. Furthermore, our efforts are guided by a commitment to good governance. We uphold the highest standards of transparency, accountability, and ethical practices. By fostering responsible decision-making and cultivating a culture of integrity, we aim to create an environment that builds trust, encourages collaboration, and ensures the long-term sustainability of our institution.

In summary, our dedication centers on achieving dynamically synergistic sustainability. We reinforce our core business pillar through enhanced academic delivery, impactful research endeavours, and enriched services. Upheld by our unwavering commitment to good governance, we believe these principles empower us to actively contribute to shaping a more sustainable and resilient future for all.

Lastly, but certainly not least, I extend a heartfelt welcome to all new students. I invite you to become valued members of our community. As you embark on this transformative journey, rest assured that my commitment is to ensure your experiences are enriching and enjoyable. Additionally, I sincerely wish you success in all your endeavours as you navigate this educational path.

"With Wisdom, We Explore"

Best wishes.

PROFESSOR. DR. MAS FAWZI BIN MOHD ALI
Vice-Chancellor
Universiti Tun Hussein Onn Malaysia

Foreword by The Deputy Vice Chancellor (Academic and International)



Assalamualaikum Warahmatullahi Wabarakatuh and Salam Sejahtera, Salam Malaysia Madani.

Firstly, congratulations and a warm welcome to all new students joining Universiti Tun Hussein Onn Malaysia (UTHM) for the academic session 2025/2026. Rest assured, at UTHM, we stand out with unique qualities and offerings that set us apart from others. We are fully committed to upholding our promises and ensuring you receive an exceptional educational experience. We are committed to your success with unwavering dedication, striving tirelessly to exceed your expectations.

Secondly, I extend my gratitude and congratulations to the Centre for Academic Development and TVET (CAD) and the faculties for their successful publication of this academic proforma. It is indeed a valuable resource that offers concise information about the various programs available. This proforma offers concise information about the various programs available and serving as a guiding tool for students, as well as assisting them in effectively planning their learning journey. By providing essential details and insights, it empowers students to make knowledged-based decisions and navigate their educational paths with clarity.

In addressing the nation's academic priorities, the Ministry of Higher Education Malaysia (MoHE) has recently initiated enhancements to academic infrastructures and infostructures, as well as emphasizing digitalization. These efforts are geared towards achieving conducive, safe, efficient, and high-quality education, while maintaining innovation, flexibility, and global competitiveness.

Additionally, to sustain students' interest and enrollment, several impactful steps being taken including hybrid programs and shortening the duration of study. Therefore, as an institution under MoHE, please anticipate our efforts toward these beneficial programs. Furthermore, we remain agile and committed to promoting Technical and Vocational Education and Training (TVET)-based academics as part of our vision to transform into a Global Technopreneur University (GTU) by 2030.

From our specific perspective, it is crucial to enhance, strengthen, and uphold our own programs and human capital. All our programs, totaling 110, are accredited by the Malaysian Qualification Agency (MQA) and their respective professional bodies. This accreditation is maintained through our qualified staff, both academic and non-academic, who undergo continuous upskilling and reskilling initiatives.

In conclusion, I sincerely hope that the initiatives implemented by UTHM will offer you invaluable experiences in exploring and acquiring competencies. With the introduction of this proforma, I envision outstanding academic accomplishments and success for each of you. This stage signifies a pivotal opportunity for you to positively impact both our nation and the global community.

"With Wisdom, We Explore"

Best wishes,

PROFESSOR DR. AFANDI BIN AHMAD
Deputy Vice Chancellor (Academic and International)
Universiti Tun Hussein Onn Malaysia

Foreword by The Dean



Assalamualaikum Warahmatullahi Wabarakatuh and Greetings,

Congratulations and thank you for choosing the Faculty of Electrical and Electronic Engineering (FKEE), Universiti Tun Hussein Onn Malaysia (UTHM).

FKEE UTHM is one of the most well-equipped engineering faculties, providing cutting-edge teaching and research facilities. With over 1,400 students from Malaysia and other countries enrolled in our undergraduate and postgraduate programs, we are proud of our diverse and inclusive academic community.

Our faculty is supported by a dedicated team of more than 140 academic staff, more than 30 assistant engineers, and administrative personnel. All of our academic programs are accredited by the Malaysian Qualifications Agency (MQA) and the Engineering Accreditation Council (EAC), ensuring the highest educational standards.

Beyond classroom learning, FKEE offers valuable opportunities for upskilling through specialized training programs, as well as outbound mobility programs, allowing students to gain global exposure and enhance their educational experience. These initiatives are designed to help you develop both technical and personal skills that will benefit you in your future career.

Everyone at FKEE shares a common goal of making a positive difference in the world, inspired by the philosophies of "continuous learning and improvement" and "giving is the best communication." At FKEE, we not only focus on electrical and electronic engineering but also on shaping well-rounded individuals who will contribute meaningfully to society.

This booklet provides important information about the Bachelor of Electronic Engineering with Honours (BEJ) program and details the courses you will take throughout your studies. Remember, success is a journey, not a destination. During this journey, you will be surrounded by a conducive, positive, and dynamic environment.

Take advantage of this opportunity to utilize our modern laboratories, where you can develop practical skills and apply theoretical concepts.

In short, this is your journey and your chance. Give it your best shot, embrace the learning curve, and make the most of the opportunities available to you, including upskilling and outbound mobility programs.

On behalf of FKEE, I wish you all the success in your studies!

PROF. TS. DR. ASMARASHID BIN PONNIRAN
Dean
Faculty of Electrical and Electronic Engineering
Universiti Tun Hussein Onn Malaysia

Vision

To be a global technical university in sustainable technology and transportation

Mission

Provide technical solution for industry and community based on tauhidic paradigm

Education Philosophy of University

UTHM education and training, founded on the tauhidic paradigm, strive to produce competent, professional and entrepreneurial graduates, driven by advanced technologies for global development.

Logo of University

The logo of UTHM displays a proton, a book, a tiered mortar board (levels of learning), a book-rest and a shield.

Symbolism:

Red	Bravery
Blue	Collaboration
Silver	Quality/ Prestige
Book-rest	Knowledge
Proton	Science and Technology
Book	Knowledge
Mortar board	Levels of study
Circle	Resilient and related to global characteristics
Shield	Confidence

The whole concept of the logo represents UTHM as a learning institution that supports knowledge expansion and development at all levels of study in science and technology.

Blue represents the close relationship among UTHM community in ensuring successful and resilient implementations of the University programmes as well as its education and research activities that are carried out for the benefit of mankind.

Red symbolises the adventurous nature of UTHM in exploring new fields to establish itself as a leader in the applications of science and technology. Thus, this reflects the spirit and self-esteem of the UTHM community.

Chancellor



HIS ROYAL HIGHNESS
TUNKU ISMAIL IBNI SULTAN IBRAHIM
Tunku Mahkota Johor

Pro-Chancellor



Yang Amat Mulia Tunku Idris Iskandar Al-Haj Ibni Sultan Ibrahim
Tunku Temenggong Johor



Yang Berhormat Tan Sri Dato' Dr. Haji Azmi Bin Rohani
Datuk Pengelola Bijaya Diraja Istana Negara

Board of Directors of University

Chairman

YBhg. Dato' Sri Ibrahim bin Ahmad

Members

YB. Prof. Dr. Mas Fawzi bin Mohd Ali
Vice-Chancellor, Universiti Tun Hussein Onn Malaysia

YBrs. Mr. Mohd Najib bin Mohd Sarif
Director, IPTA Student Admissions Division
Ministry of Higher Education

Mrs. Mahfuzah binti Baharin
Deputy Under-Secretary,
(Sector of Tax Incentive & Sectoral) TSBC (GCS) Tax Division, Ministry of Finance Malaysia

YB. Dato' (Dr.) Haji Nooh bin Gadot
Advisor, Johor Islamic Religious Council

YBhg. Prof. Ir. Dr. Mohd. Amri bin Lajis
Professor, Universiti Tun Hussein Onn Malaysia

YBrs. Mr. Shahril Anwar bin Mohd Yunos
Managing Partner, Virtus Capital Partners Sdn Bhd

YBhg. Datuk Md Jais bin Haji Sarday
Board Member, Universiti Tun Hussein Onn Malaysia

YBhg. Datuk Haji Mohd Lassim bin Burhan
Board Member, Universiti Tun Hussein Onn Malaysia

YBrs. Ir. Ts. Abdul Rahman bin Bahasa
Chief Executive Officer, Recove Group

YBrs. Encik Hasry bin Harun
Chief Executive Officer, Malaysia Rail Development Corporation

YBrs. Prof. Ir. Dr. Mohd. Amri bin Lajis
Professor, Universiti Tun Hussein Onn Malaysia

YBrs. Mohamad Irza bin Dahari @ Zahari
Administration and Diplomatic Officer, Department Of Higher Education

YBrs. Mrs. Norismalinda binti Taarif
Government Procurement Division, Ministry of Finance

Secretary

YBrs. Mr. Naim bin Maslan
Registrar/Chief Operating Officer (COO), Universiti Tun Hussein Onn Malaysia

Members of Senate

Chairman

YB. Prof. Dr. Mas Fawzi bin Mohd Ali
Vice Chancellor

Members

Prof. Dr. Afandi bin Ahmad
Deputy Vice Chancellor (Academic and International)

Prof. Ts. Dr. Rabiah Binti Ahmad
Deputy Vice Chancellor (Research and Innovation)

Prof. Ts. Dr. Abdul Rasid bin Abdul Razzaq
Deputy Vice Chancellor (Student Affairs and Alumni)

Prof. Ts. Dr. Abdul Mutalib bin Leman
Provost UTHM, Pagoh Branch Campus

Prof. Dr. Nik Hisyamudin bin Muhd Nor
Assistant Vice Chancellor / Chief Digital Officer (CDO) (Digital and Infrastructure)

Prof. Ir. Dr. Mohd Haziman bin Wan Ibrahim
Dean, Centre for Graduate Studies

Dean, Faculty of Civil Engineering and Built Environment

Prof. Ts. Dr. Asmarashid Bin Ponniran
Dean, Faculty of Electrical and Electronic Engineering

Prof. Ts. Dr. Amir Bin Khalid
Dean, Faculty of Mechanical and Manufacturing Engineering

Associate Prof. Dr. Md Asrul Nasid bin Masrom
Dean, Faculty of Technology Management and Business

Associate Prof.Ts. Dr. Mohd Hasril bin Amiruddin
Dean, Faculty of Technical and Vocational Education

Prof. Ts. Dr. Mohd Farhan bin Md. Fudzee
Dean, Faculty of Computer Science and Information Technology

Assoc. Prof. Ts. Dr. Noor Azura binti Awang
Dean, Faculty of Applied Science and Technology

Assoc. Prof. Ts. Dr. Jumadi bin Abdul Sukor
Dean, Faculty of Engineering Technology

Dr. Muhammad Faizal bin Ismail
Dean, Centre for Diploma Studies

Dean, Centre for General Studies and Co-curricular

Dean, Centre for Language Studies

Associate Prof. Dr. Shafie bin Mohamed Zabri
Dean, Johor Business School

Prof. Ir. Dr. Md Saidin bin Wahab
Director, Centre for Academic Development and TVET

Prof. Dr. Nafarizal bin Nayan
Director, Research Management Centre

Assoc. Prof. Dr. Badaruddin bin Ibrahim
Director, Malaysia Research Institute for Vocational Education and Training

Prof. Ts. Dr. Azme bin Khamis
Chairman, UTHM Council of Professors

Prof. Eur Ing. Ir. Ts. Dr. Shahiron bin Shahidan
Innovation & Commercialisation Centre

Prof. Ts. Dr. Mohd Khairul bin Ahmad
Institute for Integrated Engineering (I^2E)

Ts. Azamuddin bin Rasidi
Director, Information Technology Centre

Prof. Ir. Ts. Dr. Adnan bin Zainorabidin
Faculty of Civil Engineering and Built Environment

Prof. Ir. Dr. Erwan bin Sulaiman
Faculty of Electrical and Electronic Engineering

Prof. Ir. Dr. Fauziahanim binti Che Seman
Faculty of Electrical and Electronic Engineering

Prof. Dr. Hasan Zuhudi bin Abdullah
Faculty of Mechanical and Manufacturing Engineering

Prof. Dr. Ahmad Jais bin Alimin
Faculty of Mechanical and Manufacturing Engineering

Prof. Ts. Dr. Soew Ta Wee
Faculty of Technology Management and Business

Prof. Sr. Dr. Rozilah binti Kasim
Faculty of Technology Management and Business

Prof. Ts. Dr. Mimi Mohaffyza binti Mohamad
Faculty of Technical dan Vocational Education

Prof. Dr. Rozaida binti Ghazali
Faculty of Computer Science and Information Technology

Prof. Ts. Dr. Mohd Fadzelly bin Abu Bakar
Faculty of Applied Sciences and Technology

Prof. Ir. Dr. Mohd Amri bin Lajis
Faculty of Engineering Technology

Prof. Ir. Dr. Chan Chee Ming
Faculty of Engineering Technology

Mdm. Shereen Sabrina binti Abd Shukor
Registrar / Chief Operating Officer (COO) / Senate Secretary

Mr.Ismail bin Harun
Bursar / Chief Financial Officer (CFO)

Mdm. Siti Afifah binti Che Ismail
Chief Librarian

Mdm. Norliah Binti Yaakub
Legal Advisor

Faculty of Electrical and Electronic Engineering

Faculty Background

The Faculty of Electrical and Electronic Engineering (FKEE) was established on 1st May 2004. The Faculty consists of four departments namely:

1. Department of Electronic Engineering (JKEN)
2. Department of Electrical Engineering (JKEK)
3. Department of Graduate Studies (JPSS)
4. Department of Laboratory and Asset Management (JPMA)

The Faculty also has two Centre of Research (CoR) known as Advanced Telecommunication Research Center (ATRC) and Electric Vehicle Research Center (EVRec). There are two Centre of Excellence (CoE) at UTHM associated with the Faculty:

1 Research Center for Applied Electromagnetics (EMCenter)
2 Microelectronics & Nanotechnology Shamsuddin Research Centre (MiNT-SRC)

Currently, there are various focus groups that play pivotal roles towards research culture establishment in FKEE. The list includes the following:

1 Green and Sustainable Energy (GSEnergy)
2 Koordinasi Insulasi dan Voltan Tinggi (KVolt)
3 Power Electronics, Drives and Machines (PEDM)
4 Power Integration System (PI Sys)
5 Instrumentation and Sensing Technology (InSeT)
6 Mechatronic and Control Research Group (MCRG)
7 Group of Robotics Engineering and Technology (GREaT)
8 Computational Signal, Image and Intelligence (CSII)
9 Internet of Things (IoT)
10 Electronic and System Design (ESD)
11 Electroencephalogram and Human Potential (EEG)
12 BioMedical Engineering and Measurement System (BioMEMS)
13 VLSI and Embedded System Technology (VEST)
14 Advanced Medical Imaging and Optics (AdMedic)
15 Advanced Sensing Device and Technology (ASDT)
16 Optical Communication and Artificial Intelligence (OCAI)
17 RF and Microwave Devices (RFMD)
18 Wireless and Propagation (WaP)

The Faculty offers Undergraduate and Postgraduate programmes in both Electrical and Electronic Engineering. These programmes have been designed to cater all the stakeholders needs where the produced graduates are technically competent in their respective engineering field but also possess outstanding soft skills. The faculty offers the following programmes:

1 Bachelor of Electronic Engineering with Honours (BEJ)
2 Bachelor of Electronic Engineering (Robotics and Artificial Intelligence Systems) with Honours (BEA)
3 Bachelor of Electronic Engineering (Semiconductor and Integrated Circuit Design) with Honours (BES)
4 Bachelor of Electrical Engineering with Honours (BEV)
5 Master in Electrical Engineering (Coursework) (MEE)
6 Master in Electrical Engineering (Research) (KEE)
7 Master of Science in IoT (MET)
8 Doctor of Philosophy in Electrical Engineering (PEE)

FACULTY OF ELECTRICAL AND ELECTRONIC ENGINEERING

Vision

To be a global technical university in sustainable technology and transportation.

Mission

Provide technical solution for industry and community based on tauhidic paradigm.

Direction

UTHM as a Global Technopreneur University 2030 (#GTU2030).

Motto

With Wisdom, We Explore.

Quality Policy

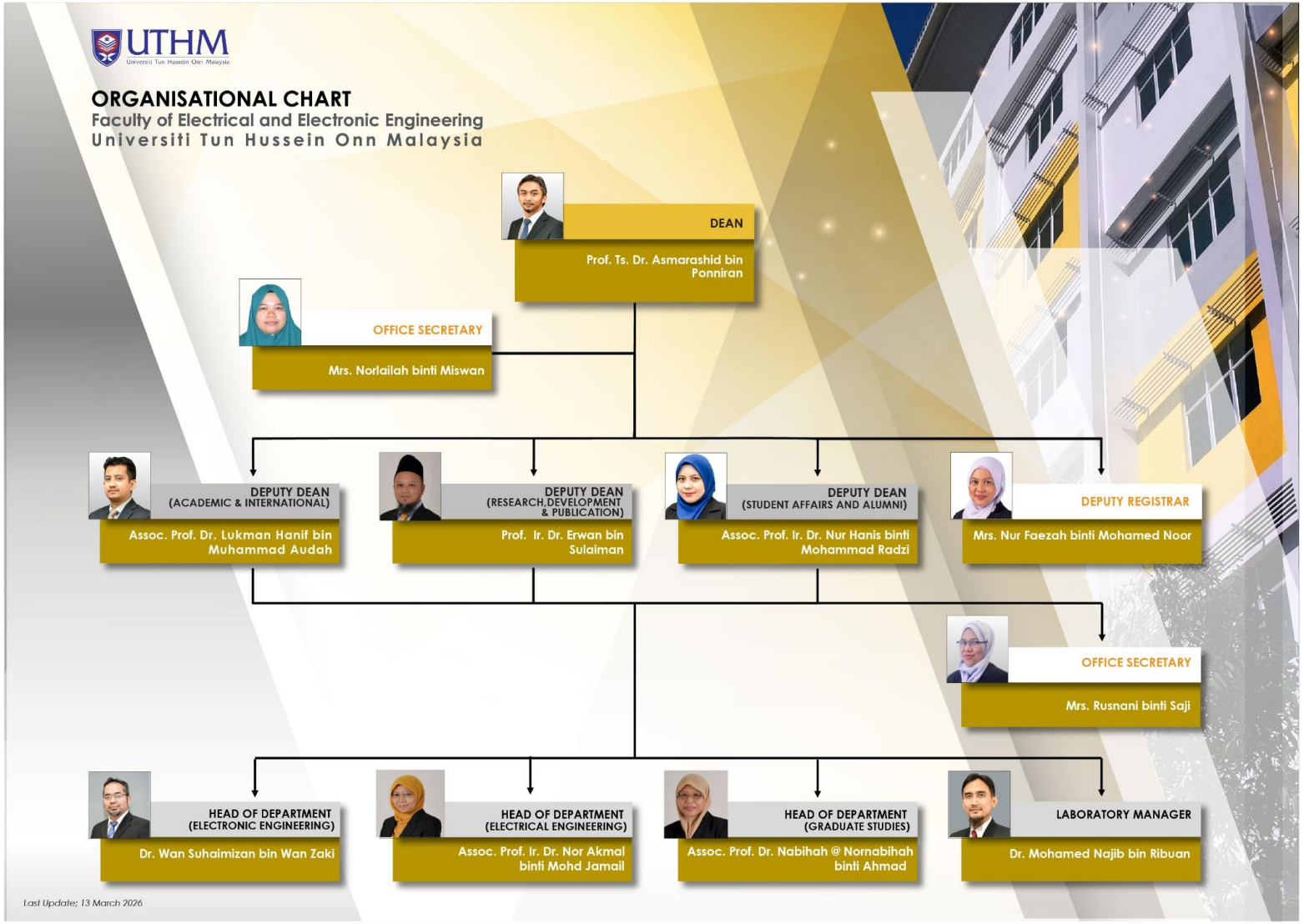
Universiti Tun Hussein Onn Malaysia is committed to offer high quality academic programmes grounded in Engineering, Science and Technology to meet the needs of its stakeholders through an outstanding quality management system in line with the ISO 9001: 2015.

FKEE Quality Objectives

FKEE staff is committed to carrying out their responsibilities to ensure that the quality objectives of the current year are achieved, monitored and reviewed in tandem with the vision and mission of the University.

1 To ensure that students enrollment exceeds the 90% target.
2 To ensure that international students enrollment exceeds 6% of the total current enrollment.
3 To ensure that new research grants exceed RM1.9 million per year.
4 To ensure that the university H-Index (SCOPUS) increases by 1 index value each year.
5 To ensure that Graduate Employability after 6 months of graduation exceeds 80%.
6 To ensure that any complaints related to the teaching and learning system or equipment are resolved within a period of not more than 6 months.

Organizational Chart



External Advisors

External Examiner

Prof. Ir. Dr. Kenneth Sundaraj
Universiti Teknikal Malaysia Melaka (UTEM)

Industrial Advisory Panel

Mr. Azman Bin Hamid
Techno Health Services Sdn. Bhd.

Mr. Teoh Giap Seng
SkyeChip Bhd.

Dr. Jeevan A/L Sirkunan
Intel Technology Sdn. Bhd.

En. Redzuan Shah bin Yusoff
TM R&D

Staff Directory

Administration

Dean
Professor Ts. Dr. Asmarashid bin Ponniran
PhD (Power Electronics) (Nagaoka University of Technology)
MEng (Electrical Power) (UTM)
BEng (Electrical) (KUiTTHO)

Deputy Dean (Academic and International)
Associate Professor Dr. Lukman Hanif Bin Muhammad Audah
PhD (Electronic Engineering) (Univ. of Surrey)
MSc (Communications Networks & Software) (Univ. of Surrey)
BEng (Electrical – Telecommunication) (UTM)

Deputy Dean (Research, Development and Publication)
Professor Ir. Dr. Erwan bin Sulaiman
PhD (Electrical Engineering) (Nagoya Institute of Technology)
MSc (Electrical) (KUiTTHO)
BEng (Electrical) (UM)

Deputy Dean (Student Affairs and Alumni)
Associate Professor Ir. Dr. Nur Hanis binti Mohammad Radzi
PhD (Electrical Power Engineering) (University of Queensland)
MEng (Electrical Power) (UTM)
BEng (Electrical) (UTM)

Head, Department of Electrical Engineering
Associate Professor Ir. Dr. Nor Akmal binti Mohd Jamail
PhD (Electrical Engineering) (UTM)
MEng (Electrical) (UTHM)
BEng (Electrical) (UTM)

Head, Department of Electronic Engineering
Dr. Wan Suhaimizan bin Wan Zaki
PhD (Electrical and Electronic Engineering) (Univ. of Nottingham)
MSc (Electronic) (UPM)
BEng (Electronic - Medical) (UTM)

Head, Department of Postgraduate Studies
Associate Professor Dr. Nabihah@Nornabihah binti Ahmad
PhD (Electronic Engineering) (Massey University)
MEng (Electrical) (KUiTTHO)
BEng (Electrical and Electronic) (UKM)

Laboratory Manager
Dr. Mohamed Najib bin Ribuan
PhD (Mechatronic) (Okayama University)
MSc (Mechatronic) (Newcastle University)
BEng (Electrical – Mechatronic) (UTM)

Deputy Registrar
Mdm. Nur Faezah binti Mohamed Noor
BSc (Psychology) UKM

Assistant Registrar
Mr.Dzulfitry Ameen bin Iskandar

Senior Assistant Administrative Officer
Mr. Nazri bin Mohd Suhud

Assistant Administrative Officer
Mdm. Nur Farahana binti Azman

Office Secretary
Mdm. Norlailah binti Miswan

Office Secretary
Mdm. Rusnani binti Saji

Senior Administrative Assistant
Mr. Mohd Azrean bin Kosni

Senior Administrative Assistant
Mr. Hirman bin Mohamad

Senior Administrative Assistant
Mdm. Nurulnadia binti Ghadzali

Senior Administrative Assistant
Mr. Muhammad Ariff bin Md Ngadiran

Administrative Assistant
Ms. Nur Shahila binti Salim

Operational Assistant
Mr. Hasri Suhaimi bin Karmon

Department of Electronic Engineering (JKEN)

Head of Department
Dr. Wan Suhaimizan bin Wan Zaki
Phd (Electrical and Electronic Engineering) (Nottingham University)
MEng (Electronic) (UPM)
BEng (Medical Electronic) (UTM)

Specialisation Area: Communication Engineering (BEP)

Associate Professor Dr. Lukman Hanif bin Muhammad Audah
PhD (Electronic Engineering) (Univ. of Surrey)
MSc (Communications Networks & Software) (Univ. of Surrey)
BEng (Electrical – Telecommunication) (UTM)

Professor Ir. Dr. Fauziahanim binti Che Seman
PhD (Electrical Engineering) (Queen's University of Belfast)
MEng (Electrical - Communication) (KUiTTHO)
BEng (Telecommunication) (UTM)

Professor Dr. Muhammad Ramlee bin Kamarudin
PhD (Electrical Engineering) (University of Birmingham)
MEng (Communication Engineering) (University of Birmingham)
BEng (Engineering) (UTM)

Associate Professor Dr. Khairun Nidzam bin Ramli
PhD (Electrical Engineering) (University of Bradford)
MEng (Communication & Computer Engineering) (UKM)
BEng (Electronic) (University of Manchester Institute. of Science & Technology)

Associate Professor Dr. Maisara binti Othman
PhD (Metro Access and Short Range Systems) (Technical University of Denmark)
MEng (Communication & Network) (UPM)
BEng (Computer & Communication System) (UPM)

Associate Professor Dr. Noran Azizan bin Cholan
PhD (Communication and Network Engineering) (UPM)
MEng (Electrical – Electronics and Telecommunications) (UTM)
BEng (Electronic) (UNITEN)

Associate Professor Dr. Zuhairiah binti Zainal Abidin
PhD (Communication Engineering) (University of Bradford)
MEng (Electrical) (KUiTTHO)
BEng (Electronic) (UTM)

Associate Professor Dr. Samsul Haimi bin Dahlan
PhD (Signal and Telecommunication Engineering) (University of Rennes)
MEng (Electrical – Electronic and Telecommunication) (UTM)
BEng (Electrical) (UKM)

Associate Professor Dr. Syarfa' Zahirah binti Sapuan
PhD (Electrical Engineering) (UTHM)
MEng (Electrical & Electronic) (Nanyang Technology University)
BEng (Electrical) (KUiTTHO)

Associate Professor Dr. Xavier Ngu Toh Ik
PhD (Electrical Engineering) (University of Nottingham)
BEng (Electrical) (KUiTTHO)

Associate Professor Dr. Yee See Khee
PhD (Electrical Engineering) (UTHM)
MEng (Electrical) (UTHM)
BEng (Electrical) (KUiTTHO)

Associate Professor Dr. Mariyam Jamilah binti Homam
PhD (Electrical Engineering) (Univ. of Leicester)
MEng (Communication & Computer Engineering) (UKM)
BEng (Communication & Computer Engineering) (UKM)

Associate Professor Dr. Shaharil bin Mohd Shah
PhD (Electrical & Electronic Engineering) (University of Birmingham)
MSc (Microwave and Wireless Subsystems Design) (University of Surrey)
BEng (Electronic) (MMU)

Associate Professor Dr. Farhana binti Ahmad Po'ad
PhD (Communication System) (USM)
MEng (Electrical) (UTHM)
BEng (Electronic-Communication) (KUiTTHO)

Associate Professor Ts. Dr. Jong Siat Ling
PhD (Electrical Engineering) (UTM)
MEng (Electrical – Electronics and Telecommunications) (UTM)
BEng (Electrical – Telecommunication) (UTHM)

Associate Professor Dr. Saizalmursidi bin Md Mustam
PhD (Electrical Engineering) (UTM)
MEng (Electrical) (UTHM)
BEng (Electronic – Communication) (KUiTTHO)

Dr. Abul Khair bin Anuar
PhD (Communication Systems) (Lancaster University)
MEng (Communication & Computer Engineering) (UKM)
BEng (Communication & Computer Engineering) (UKM)

Dr. Ansar bin Jamil
PhD (Electrical & Electronic Engineering) (Loughborough University)
MEng (Electrical – Electronics and Telecommunications) (UTM)
BEng (Electrical – Communication) (UTM)

Dr. Ariffuddin bin Joret
PhD (Electrical Engineering) (UTHM)
MEng (Electrical & Electronic) (USM)
BEng (Electrical) (UiTM)

Dr. Maslina binti Yaacob
PhD (Electrical Engineering) (UTM)
MEng Electrical) (UTM)
BEng (Electrical – Telecommunication) (UTM)

Dr. Norshidah binti Katiran
PhD (Electrical Engineering) (UTM)
MEng (Communication & Computer) (UKM)
BEng (Electrical – Telecommunication) (UTM)

Dr. Rahmat bin Talib
PhD (Electrical Engineering) (UTHM)
MEng (Electrical-Electronic and Telecommunication) (UTM)
BEng (Electrical, Electronics and System) (UKM)

Dr. Roshayati binti Yahya @ Atan
PhD (Electrical Engineering) (UTM)
MSc (Electrical – Electronic and Telecommunication) (UTM)
BEng (Electrical – Electronic and Telecommunication) (KUiTTHO)

Dr. Shipun Anuar bin Hamzah
PhD (Electrical Engineering) (UTM)
MEng (Computer & Communication) (UKM)
BEng (Electrical) (UTM)

Dr. Siti Hajar Aminah binti Ali
PhD (Electrical & Electronic Engineering) (Kobe University)
MEng (Electrical – Electronics, and Telecommunications) (UTM)
BEng (Electrical-Telecommunications) (UTM)

Dr. Elfarizanis binti Baharudin
PhD (Wireless Communication Engineering) (UPM)
MEng (Communication and Computer) (UKM)
BEng (Electrical) (UiTM)

Mr. Aizan bin Ubin
MEng (Electrical) (KUiTTHO)
BEng (Electrical) (Univ. of Toledo, Ohio)

Mdm. Nurulhuda binti Ismail
MEng (Electrical) (UTHM)
BEng (Electrical) (UiTM)

Ts. Sharifah binti Saon
MEng (Electrical) (KUiTTHO)
BSc (Electrical) (KUiTTHO)

Specialisation Area: Computer Engineering (BEC)

Associate Professor Ir. Dr. Abd Kadir bin Mahamad
PhD (Electrical Engineering and Computer Science) (Kumamoto University)
MEng (Electrical) (KUiTTHO)
BEng (Computer Technology) (KUiTTHO)

Associate Professor Ir. Dr. Siti Zarina binti Mohd. Muji
PhD (Electrical Engineering) (UTM)
MSc (Electrical & Electronic) (USM)
BEng (Electrical & Electronics) (USM)

Associate Professor Dr. Danial bin Md. Nor
PhD (Electrical Engineering) (UTHM)
MSc (Information Technology) (USM)
BEng (Electrical) (UTM)

Associate Professor Ir. Ts. Dr. Mohd Norzali bin Hj. Mohd
PhD (Information Sciences & Biomedical Engineering) (Kagoshima University)
MEng (Radiography) (University of Fukui)
BEng (Radiography) (University of Fukui)

Associate Professor Ir. Dr. Norfaiza binti Fuad
PhD (Electrical Engineering) (UiTM)
MEng (Computer and Communication System) (UPM)
BEng (Computer Engineering) (UTM)

Associate Professor Dr. Tay Kim Gaik
PhD (Mathematics) (UTM)
Master (Mathematics) (UTM)
Bachelor (Mathematics) (UTM)

Associate Professor Dr. Chessda Uttraphan a/l Eh Kan
PhD (Electrical Engineering) (UTM)
MEng (Electrical) (KUiTTHO)
BEng (Electrical) (UTM)

Associate Professor Dr. Nor Surayahani binti Suriani
PhD (Electrical, Electronic & System Engineering) (UKM)
MEng (Electrical – Electronics & Telecommunication) (UTM)
BEng (Computer Engineering) (UPM)

Associate Professor Ts. Dr. Nan bin Mad Sahar
PhD (Electrical Engineering) (Okayama University)
MEng (System & Communication Engineering) (Okayama University)
BEng (Information & Computer Engineering) (Okayama University)

Dr. Chew Chang Choon
PhD (Computer Engineering) (Okayama University)
MEng (Electrical) (KUiTTHO)
BEng (Electrical) (UTM)

Dr. Chua King Lee
PhD (Electrical Engineering) (UTHM)
MSc (Microelectronic) (UKM)
BEng (Electrical) (KUiTTHO)

Dr. Mohamad Hairol bin Jabbar
PhD (Nanoelectronic & Nanotechnology) (Universite de Grenoble)
MSc (Electrical and Electronic) (Liverpool John Moores University)
BEng (Electrical) (KUiTTHO)

Dr. Nik Shahidah Afifi binti Md Taujuddin
PhD (Information Technology) (UTHM)
MSc (Computer Science) (UTM)
BEng (Computer Engineering) (UTM)

Dr. Radzi bin Ambar
PhD (Robotic) (Kyushu Institute of Technology)
MEng (Electrical) (UTHM)
BEng (Communication & Computer Engineering) (Toyohashi University of Technology)

Ts. Dr. Suhaila binti Sari
PhD (Science and Engineering) (Saitama University)
MSc (Electronic) (Yamagata University)
BEng (Electronic) (Yamagata University)

Dr. Tasiransurini binti Ab. Rahman
PhD (Electronic Engineering) (UMP)
MEng (Communication & Computer) (UKM)
BEng (Electrical) (KUiTTHO)

Mdm. Munirah binti Ab Rahman
MEng (Electrical – Communication & Computer) (UKM)
BEng (Electrical) (KUiTTHO)

Specialisation Area: Mechatronic and Robotic Engineering (BER)

Professor Dr. Elmy Johana binti Mohamad
PhD (Electrical Engineering) (UTM)
MEng Electrical – Mechatronics) (UTM)
BEng (Electrical) (KUiTTHO)

Associate Professor Dr. Rosli bin Omar
PhD (Autonomous System) (University of Leicester)
MEng (Electrical) (UTM)
BEng (Electrical – Instrumentation & Control System) (UTM)

Associate Professor Ir. Dr. Tee Kian Sek
PhD (Mechatronics) (University of Leeds)
BEng (Electrical – Mechatronics) (UTM)

Associate Professor Ir. Ts. Dr. Mohd Razali bin Tomari
PhD (Computer Vision and Robotic) (Saitama University)
MSc (Intelligent System) (UPM)
BEng (Electrical – Mechatronic) (UTM)

Associate Professor Dr. Jamaludin bin Jalani
PhD (Robotik) (University of Bristol)
MSc (Mechatronic) (IIUM)
BEng (electrical & electronic) (Leeds Metropolitan University)
Dip. (Electronic) (UTM)

Associate Professor Ir. Dr. Chia Kim Seng
PhD (Electrical Engineering) (UTM)
BEng (Electrical – Instrumentation & Control) (UTM)

Associate Professor Dr. Abu Ubaidah bin Shamsudin
PhD (Robotics) (Tohoku University)
MEng (Mechatronic) (UIA)
BEng (Electrical & Electronic) (UTHM)

Associate Professor Dr. Herdawatie binti Abdul Kadir
PhD (Control and Robotic) (USM)
MEng (Electrical – Mechatronic) (UTM)
BEng (Electrical) (UTM)

Associate Professor Dr. Hisyam bin Abdul Rahman
PhD (Electrical Engineering) (UTM)
BEng (Electrical – Mechatronic) (UTM)

Ts. Dr. Ain binti Nazari
PhD (Electrical, Electronic and System Engineering) (UKM)
MEng (Electrical – Mechatronics & Automatic Control) (UTM)
BEng (Electrical) (UTHM)

Ir. Dr. Budiman Azzali bin Basir
PhD (Control System and Digital Electronics) (UTM)
MEng (Mechatronic Engineering) (UTM)
BEng (Mechatronic Engineering) (UTM)

Dr. Mohamed Najib bin Ribuan
PhD (Mechatronics) (Okayama University)
MSc (Mechatronics) (Newcastle University)
BEng (Electrical– Mechatronics) (UTM)

Ts. Dr. Mohammad Afif bin Ayob
PhD (Electrical Engineering) (UTHM)
MEng (Electrical) (UTHM)
BEng (Electrical) (UTHM)

Dr. Mohd Fadzli bin Abd Shaib
PhD (Electrical Engineering) (UTM)
MEng (Electrical) (UTM)
BEng (Electrical & Electronics) (UNITEN)

Dr. Mohd Hafiz bin A. Jalil @ Zainuddin
PhD (Electrical Engineering) (UiTM)
MEng (Electrical – Mechatronics) (UTM)
BEng (Electrical) (UiTM)

Dr. Noor Azizi bin Mardi
PhD (Control System Engineering) (RMIT University)
BEng (Aerospace Engineering) (University of Minnesota)

Ir. Dr. Noorhamizah binti Mohamed Nasir
PhD (Electrical Engineering) (UTHM)
MEng (Electrical) (UTHM)
BEng (Electrical) (UTHM)

Dr. Rafidah binti Ngadengon @ Ngadungon
PhD (Electrical Engineering) (UTM)
MEng (Mechatronics) (UTM)
BEng (Communication) (Kitami Institute of Technology)

Dr. Rohaida binti Mat Akir
PhD (Electrical and Electronic Engineering) (UKM)
MEng (Electrical – Electronic and Telecommunication) (UTM)
BEng (Electrical - Telecommunication) (UTM)

Ts. Mohamad Fauzi bin Zakaria
MEng (Control & Automation) (UPM)
BEng (Electrical) (UTM)

Ts. Reza Ezuan bin Samin
MEng (Electrical) (UTHM)
BEng (Electronics) (USM)

Specialisation Area: Microelectronic Engineering (BEM)

Professor Dr. Mohd Khairul bin Ahmad
PhD Engineering (Electronic) (Shizuoka University)
MEng (Electrical) (UiTM)
BEng (Electronic) (Gunma University)

Professor Dr. Nafarizal bin Nayan
PhD Engineering (Electrical Engineering) (Nagoya University)
MEng (Electronic) (Nagoya University)
BEng (Electrical and Electronic) (Nagoya University)

Associate Professor Dr. Fariza binti Mohamad
PhD Engineering (Functional Materials Engineering) (Toyohashi University of Technology)
MEng (Electrical & Electronic) (Toyohashi University of Technology)
BEng (Electrical & Electronic) (Toyohashi University of Technology)

Associate Professor Dr. Marlia binti Morsin
PhD (Micro Engineering & Nano Electronic) (UKM)
MEng (Electrical) (KUiTTHO)
BEng (Computer Engineering) (UTM)

Associate Professor Dr. Nabihah@Nornabihah binti Ahmad
PhD (Electronic Engineering) (Massey University)
MEng (Electrical) (KUiTTHO)
BEng (Electrical and Electronic) (UKM)

Dr. Intan Sue Liana binti Abdul Hamid
PhD (Microelectromechanical) (USM)
MEng (Electrical) (UTHM)
BEng (Microelectronic) (UKM)

Dr. Jais bin Lias
PhD (Electronic Engineering) (Nagaoka University of Technology)
MEng (Electrical, Electronic & Information Engineering) (Nagaoka University of Technology)
BEng (Electrical & Electronic) (Tottori University)

Dr. Muhammad Anas bin Razali
PhD (Electronic Engineering) (University of Surrey)
MSc (Electrical and Electronic) (University of Surrey)
BEng (Electrical - Electronic) (UTM)

Ir. Ts. Dr. Nurfarina binti Zainal
PhD (Electrical & Electronic Engineering) (Queen's University Belfast)
BEng (Electrical and Electronic) (Swansea University)

Dr. Rahmat bin Sanudin
PhD (Electronic Engineering) (University of Edinburgh)
MEng (Electrical – Electronics and Telecommunications) (UTM)
BEng (Electrical and Electronic) (UNITEN)

Dr. Riyaz Ahmad bin Mohamed Ali
PhD (Medical Biosensor) (Osaka University)
MEng (Electrical) (UTHM)
BEng (Electrical) (UTHM)

Dr. Warsuzarina binti Mat Jubadi
PhD (Electrical and Electronic Engineering) (University of Manchester)
MEng (Electrical – Electronics and Telecommunications) (UTM)
BEng (Electrical – Electronic) (UTM)

Mdm. Rosnah binti Mohd Zain
MEng (Electrical) (KUiTTHO)
BEng (Electrical) (UTM)

Specialisation Area: Medical Electronic Engineering (BEU)

Professor Ts. Dr. Muhammad Mahadi bin Abdul Jamil
PhD (Electronic Engineering – Medical) (University of Bradford)
BEng (Medical Engineering) (University of Bradford)

Professor Ir. Dr. Soon Chin Fhong
PhD (Molecular & Biomedical Engineering) (University of Bradford)
MEng (Electrical) (ITTHO)
BEng (Medical Electronics) (ITTHO)

Associate Professor Ir. Dr. Audrey Huong Kah Ching
PhD (Biomedical Optics and Imaging) (University of Nottingham)
BEng (Medical Electronic) (KUiTTHO)

Associate Professor Ir. Dr. Nabilah binti Ibrahim
PhD Engineering (Electronic) (Tohoku University)
MEng (Electrical and Computer Science) (Shibaura Institute of Technology)
BEng (Electrical – Communication) (Shibaura Institute of Technology)

Associate Professor Ts. Dr. Nur Anida binti Jumadi
PhD (Electrical & Electronic Engineering) (UKM)
MSc (Electrical) (Queen Mary University of London)
BEng (Electrical) (KUiTTHO)

Associate Professor Dr. Nurmiza binti Othman
PhD (Electrical and Electronic Engineering) (Kyushu University)
MEng (Electrical and Electronic) (Utsunomiya University)
BEng (Electrical and Electronic) (Utsunomiya University)

Associate Professor Ir. Dr. Farhanahani binti Mahmud
PhD Engineering (Biomechanical Science & Bioengineering) (Osaka University)
BEng (Electric & Electronic Engineering) (Toyama University)

Associate Professor Dr. Wan Mahani Hafizah binti Wan Mahmud
PhD (Biomedical Engineering) (UTM)
BEng (Biomedical Engineering) (UTM)

Associate Professor Ts. Dr. Muhammad Hazli bin Hj. Mazlan
PhD (Biomedical Engineering – Biomechanical) (Kyushu University)
MEng (Biomedical) (UM)
BEng (Electrical) (KUiTTHO)

Dr. Mohamad Nazib bin Adon
PhD (Electrical Engineering) (UTHM)
MEng (Electrical – Electronic and Telecommunication) (UTM)
BEng (Electrical) (UTM)

Dr. Nur Ilyani binti Ramli
PhD (Electronic Engineering – Medical) (University of Bradford)
BEng (Electrical and Electronic) (Leeds Metropolitan University)

Dr. Wan Suhaimizan bin Wan Zaki
Phd (Electrical and Electronic Engineering) (Nottingham University)
MEng (Electronic) (UPM)
BEng (Medical Electronic) (UTM)

Ms. Masnani binti Mohamed
MEng (Electrical) (UTM)
BEng (Electrical) (UiTM)

Department of Electrical Engineering (JKEK)

Head of Department
Associate Professor Ir. Dr. Nor Akmal binti Mohd Jamail
PhD (Electrical Engineering) (UTM)
MEng (Electrical) (UTHM)
BEng (Electrical) (UTM)

Professor Ts. Dr. Asmarashid bin Ponniran
PhD (Power Electronics) (Nagaoka University of Technology)
MEng (Electrical Power) (UTM)
BEng (Electrical) (KUiTTHO)

Professor Ir. Dr. Erwan bin Sulaiman
PhD (Electrical Engineering) (Nagoya Institute of Technology)
MSc (Electrical) (KUiTTHO)
BEng (Electrical) (UM)

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MEng (Electrical) (UTM)
BEng (Electrical) (UTM)

Associate Professor Ir. Ts. Dr. Muhammad Saufi bin Kamarudin
PhD (Electrical Engineering) (Cardiff University)
MEng (Electrical Power) (UTM)
BEng (Electrical) (UTM)

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PhD (Electrical Engineering) (UTM)
MEng (Instrumentation & Control) (Institut Teknologi Bandung)
BEng (Electrical) (Universitas Bung Hatta)

Associate Professor Ts. Dr. Kok Boon Ching
PhD (Electrical Engineering) (UTM)
MEng (Electrical) (UTM)
BEng (Electrical) (UTM)

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PhD (Electrical Engineering) (Loughborough University)
MEng (Electrical Power) (UPM)
BEng (Electrical & Electronics) (UPM)

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PhD (Electrical Engineering) (UTM)
MEng (Electrical) (Institut Teknologi Sepuluh Nopember)
BEng (Electrical) (Universitas Brawijaya)

Associate Professor Ir. Ts. Dr. Rahisham bin Abd Rahman
PhD (High Voltage Engineering) (Cardiff University)
BEng (Electrical & Electronic) (Cardiff University)

Associate Professor Ir. Dr. Nur Hanis binti Mohammad Radzi
PhD (Electrical Power Engineering) (University of Queensland)
MEng (Electrical Power) (UTM)
BEng (Electrical) (UTM)

Associate Professor Ir. Ir. Dr. Mohd Fairouz bin Mohd Yousof
Ph.D (High Voltage Engineering) (University of Queensland)
MEng (Electrical Power) (UTM)
BEng (Electrical) (UTM)

Associate Professor Ts. Dr. Siti Amely Binti Jumaat
PhD (Electrical Engineering) (UiTM)
MEng (Electrical Power) (UTM)
BEng (Mechatronic) (KUiTTHO)

Associate Professor Ts. Dr. Sim Sy Yi
PhD (Electrical & Electronics Engineering) (UTHM)
B.Eng (Electrical & Electronics Engineering) (UTHM)

Associate Professor Dr. Khairul Anuar bin Mohamad
PhD (Electronic Engineering) (Muroran Institute of Technology)
MEng (Microelectronic) (University of Newcastle Upon Tyne)
BEng (Electronic) (University of Electro-Communications)

Associate Professor Dr. Nor Hafizah binti Ngajikin
PhD (Electrical Engineering) (UTM)
MEng (Electrical) (UTM)
BEng (Electrical - Telecommunication) (UTM)

Associate Professor Ts. Dr. Mohd Noor bin Abdullah
PhD (Electrical Power Engineering) (UM)
MEng (Electrical Power) (UTM)
BEng (Electrical) (UTM)

Dr. Afarulrazi bin Abu Bakar
PhD (Electrical Engineering) (UTHM)
MEng (Electrical) (UTHM)
BEng (Electrical) (UiTM)

Ts. Dr. Ahmad Fateh bin Mohamad Nor
PhD (Electrical Power Engineering) (UTeM)
MEng (Electrical Power Engineering) (UTeM)
BEng (Electrical-Power Electronic and Drive) (UTeM)

Dr. Jabbar Al-Fattah bin Yahaya
PhD (Electrical Power Engineering) (UNITEN)
MEng (UM)
BEng (Electronic-Telecommunication) (University of Leeds)

Ts. Dr. Mahyuzie bin Jenal
PhD (Electrical Engineering) (UTHM)
MEng (Electrical) (UTHM)
BEng (Electrical) (UTM)

Dr. Md Zarafi bin Ahmad
PhD (Electrical Engineering) (UTHM)
MEng (Electrical – Power) (UTM)
BEng (Electrical) (UiTM)

Dr. Mohd Aifaa bin Mohd Ariff
PhD (Electrical Engineering) (Imperial College London)
MEng (Electrical Power) (UTM)
BEng (Electrical) (UTM)

Dr. Nordiana Azlin binti Othman
PhD (Electrical Engineering) (UTM)
BEng (Electrical) (UTM)

Dr. Roziah binti Aziz
PhD (Power Electronics, Drives and Machines) (Newcastle university)
MEng (Electrical) (UTHM)
BEng (Electrical) (UTM)

Dr. Suriana binti Salimin
PhD (Electrical Power Engineering) (Newcastle University)
MSc (Power Distribution Engineering) (University of Newcastle Upon Tyne)
BEng (Electrical) (UTM)

Ts. Dr. Syed Zahurul Islam
PhD (Electrical Engineering) (UPM)
MEng (Electrical) (UNITEN)
BEng (Computer Science and Engineering) (University of Dhaka)

Dr. Mimi Faisyalini Ramli
PhD (Electrical & Electronics Engineering) (University of Manchester)
MEng (Electrical & Electronic Engineering) (UTM)
BEng (Electrical & Electronic Engineering) (UTM)

Ts. Dr. Zuraidah Binti Ngadiron
PhD (Electrical Engineering) (UTHM)
M. Eng (Electrical Power Engineering) (UTHM)
B. Eng (Electrical Engineering – Communication (UTM)
Dip. (Electrical Engineering – Communication) (UTM)

Mdm. Rohaiza binti Hamdan
MEng (Electrical Power) (UTM)
BEng (Electrical Power) (UNITEN)

Mr. Suhaimi bin Saiman
MEng (Electrical Power) (UM)
BEng (Electrical and Electronic) (Leeds Metropolitan University)

Department of Laboratory and Asset Management (JPMA)

Laboratory Manager
Dr. Mohamed Najib Bin Ribuan
PhD (Mechatronic) (Okayama University, Japan)
MSc (Mechatronic) (Newcastle University, UK)
BEng (Electrical-Mechatronic) (UTM)

Mr. Nik Mohd Asri bin Nik Ismail
MEng (Electrical) (UTHM)
BEng (Electrical) (UiTM)

Ts. Ezri bin Mohd
MEng (Electrical) (UTHM)
BEng (Telecommunication) (UTM)

Mr. Mohd Jais bin Che Soh
BEng (Electrical) (UM)

Ts. Muhammad Nafis bin Ismail
BEng (Electrical) (UTM)

Ts. Wan Nur Hafsha binti Wan Kairuddin
MEng (Electrical) (UTHM)
BEng (Electronic) (USM)

Mr. Abdul Hamid bin Sabran
Cert. (Electronic Engineering (Communication)) (Poli. Kota Bharu)

Mr. Aidi bin Basar
Dip. (Electrical Engineering) (Poli. Merlimau)
Cert. (Electrical Engineering) (Poli. Ibrahim Sultan)

Mr. Ayoub bin Kasno
Cert. (Electronic & Computer Technology) (Poli. Ungku Omar)

Mr. Hairul Nizam bin Tukimin
Cert. (Electronic Engineering) (Poli. Ibrahim Sultan)

Mr. K. Kovalan A/L Kanawathi
Dip. (Electronic Engineering) (Poli. Kota Bharu)
Cert. (Electrical & Electronic Engineering) (Poli. Ibrahim Sultan)

Mr. M. Nazeri bin Sarmijan
Dip. (Electrical Engineering) (Poli. Port Dickson)
Cert. (Electrical Power) (Poli. Sultan Hj. Ahmad Shah)

Mr. Mahmod bin Munajat
Cert. (Electronic Communication Engineering) (Poli. Ibrahim Sultan)

Mr. Maslan bin Ahmad
Cert. (Electronic Communication) (Poli. Kota Bharu)

En. Mustaffa bin Ahmad
Dip (Electrical & Electronic Engineering) (Poli. Ungku Omar)

Mr. Md Hapic bin Mohamad
Cert. (Electronic Communication) (Poli. Sultan Hj, Ahmad Shah)

Mr. Md. Rabani bin Adnan
Dip. (Electrical Engineering (Communication)) (UTM)

Mr. Md. Zaihan bin Md. Lajis
Cert. (Electrical Power) (Poli. Sultan Abdul Halim Muadzam Shah)

Mr. Mohd Shahidan bin Madiah
Cert. (Electronic Engineering (Control)) (Poli. Ibrahim Sultan)

Mr. Mohd Shamsuddin bin Muslim
Cert. (Electrical Power) (Poli. Port Dickson)

Mr. Mohd Zaki bin Zakaria
Cert. (Electrical & Electronics Engineering) (Poli. Ibrahim Sultan)

Mdm. Nooreis Shadila binti Jarkasi
Dip. (Electronic Engineering (Computer)) (Poli. Seberang Perai)
Cert. (Electrical & Electronics Engineering) (Poli. Ibrahim Sultan)

Mr. Norazizi bin Hamisan
Dip (Electronic Engineering) (Poli. Ibrahim Sultan)
Cert (Electrical Engineering) (Poli Port Dickson)

Mdm. Nurain binti Azizul
Cert. (Electrical and Electronic Engineering) (Poli. Port Dickson)

Mdm. Nurul Aqla binti Abdul Razak
Dip. (Electrical & Electronic Engineering) (Poli. Ibrahim Sultan)
Cert. (Electrical & Electronics Engineering) (Poli. Ibrahim Sultan)

Mr. Ramlan bin Ralim
Dip. (Electronics Communication Engineering) (Poli.Sultan Hj. Ahmad Shah)
Cert. (Electronics Communication Engineering) (Poli.Sultan Hj. Ahmad Shah)

Mr. Rosley bin Sawarno
Cert. (Electronics Control) (PSA)

Mr. Sahalan bin Yasin
Cert. (Electronic Communication Engineering) (Poli. Sultan Hj. Ahmad Shah)

Mr. Sharifunazri bin Johari
Cert. (Electronic Communication) (Poli.Sultan Hj. Ahmad Shah)

Mdm. Siti Ruslina binti Mohamad Rusli
Dip. (Electronics Engineering) (UiTM)

Mdm. Suhaini binti Tunan
Cert. (Electrical Power) (Poli. Port Dickson)

Mr. Syafiq Afiq bin Sulaiman
Cert. (Electrical Engineering) (Poli. Ibrahim Sultan)

Mr. Uzli bin Yusof
Cert. (Electronic Engineering (Communication)) (Poli.Sultan Hj. Ahmad Shah)

Mdm. Wan Nor Azliza binti Wan Abdullah
Dip. (Electronic Engineering (Computer)) (Poli.Sultan Hj. Ahmad Shah)
Cert. (Electronic Engineering (Control)) (Poli. Ibrahim Sultan)

Mdm. Junaidah binti Azlan
Sijil Penolong Pegawai Sains Program Bridging, UTM

Mdm. Wasnita binti Hamsan
Sijil Penolong Pegawai Sains Program Bridging, UTM

PROGRAMME INFORMATION

BACHELOR OF ELECTRONIC ENGINEERING (SEMICONDUCTOR AND INTEGRATED CIRCUIT DESIGN) WITH HONOURS (BES)

About the Programme

The Bachelor of Electronic Engineering (Semiconductor and Integrated Circuit Design) with Honours programme is designed in alignment with the latest developments in electronic engineering, with particular emphasis on Semiconductor and Integrated Circuit Design, to equip students with the competencies required to address complex engineering problems in this field. The programme structure comprises core electronic engineering courses, specialised elective courses in Semiconductor and Integrated Circuit Design, and laboratory components that integrate experimental work and engineering practice. Specialised courses offered including semiconductor physics, VLSI integrated circuit (IC) design, microfabrication and semiconductor manufacturing processes, MEMs and nanoelectronic devices, system-on-chip (SoC) design, electronic design automation (EDA) tools, IC testing and reliability. Graduates of the programme are trained to be technically competent and professionally prepared to meet current industrial demands at both national and international levels through design-oriented laboratories, industry-relevant projects, capstone project, and final-year year project. In addition, they are equipped with essential generic skills that are applied holistically in professional engineering practice. Furthermore, the programme nurtures graduates to uphold ethical standards and professional integrity in fulfilling the needs and expectations of the global society.

Programme Structure and Assessment

This program consists of 135 credits to be completed within eight (8) semesters. Assessment of students' performance is based on formative and summative evaluation conducted throughout each semester. The short semester in Year 3 is occupied for industrial training.

Duration and Award

Duration : Full Time – Four (4) Years. Intake in October and March
Awards : Bachelor of Electronic Engineering (Semiconductor and Integrated Circuit Design) With Honours

Year 1 (Semester 1 & 2)
Occupational Safety and Health, Ordinary Differential Equations, Computer Programming, Electric Circuits I, Instrumentation and Measurement, Fundamental of Electronic Laboratory, Multivariable Calculus, Electric Circuits II, Analog Electronics and Digital Electronics.

Year 2 (Semester 3 & 4)
Creativity and Innovation, Numerical Methods, Control Systems, Signals and Systems, Programming Language for IC Design, Electronic Engineering Laboratory I, Engineering Economics and Entrepreneurship, Engineering Statistics, Electromagnetic Fields and Waves, Power Systems, Fundamental of Semiconductor, and Electronic Engineering Laboratory II.

Year 3 (Semester 5 & 6)
Engineers and Society, Microprocessor and Computer Organisation, Electronic Circuits Analysis and Design, Electronic Communication Systems, Digital Design, VLSI System, Electronic Engineering Laboratory III, Engineering Management, Integrated Design Project, Digital Signal Processing, Engineering Practices and Advanced Physical Design.

Year 3 (Short Semester – 10 Weeks)
Industrial Training.

Year 4 (Semester 7 & 8)
Final Year Project I, Elective Course I, Elective Course II, Embedded System with SoC, Micro Fabrication, Analog IC Design, Electronic Engineering Laboratory IV, Final Year Project II, Elective Course III, IC Packaging, and Microelectronic Engineering Laboratory.

Professional Accreditation
This program is recognized by the Public Service Department of Malaysia and accredited by the Malaysian Qualification Agencies (MQA) and Engineering Accreditation Council (EAC).

Career Opportunities
IC Design Engineer (Analog / Digital / Mixed-signal), Physical Design Engineer, Semiconductor Test Engineer, ASIC/SoC Design Engineer, IC Layout Engineer, Verification Engineer, Design for Testability (DFT) Engineer, Device Engineer, Application Engineer (Semiconductor), Field Application Engineer (FAE), Yield Engineer, Failure Analysis Engineer, Reliability Engineer, Production/Process Control Engineer, Post-Silicon Validation Engineer, and Development / R&D Engineer.

Commencement of Study
Twice a year in October and March

Contact Us
UTHM website: https://uthm.edu.my/
FKEE website: https://fkee.uthm.edu.my/
Regarding Bachelor of Electronic Engineering (Semiconductor and Integrated Circuit Design) with Honours Programme (BES)
Dr. Wan Suhaimizan bin Wan Zaki
☎ +607 – 9508265
✉ mizan@uthm.edu.my

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO	Statement
1	Graduates Electronic Engineering who establish themselves as globally recognised, competent, and professional talents, contributing effectively to sustainable technology or transportation industries.
2	Graduates who demonstrate resilience, adaptability, and a technopreneurial mindset in addressing societal and industrial challenges through innovative and sustainable solutions.
3	Graduates who uphold trustworthiness, ethical values, and good governance in leadership roles while continuously engaging in lifelong learning and career growth.

PROGRAMME LEARNING OUTCOMES (PLO)

PLO	Domain	PLO Statement
1	Engineering Knowledge (EAC 1)	Apply knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialization as specified in WK1 to WK4 respectively to develop solutions to complex engineering problems
2	Problem Analysis (EAC 2)	Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences with holistic considerations for sustainable development (WK1 to WK4)
3	Design/Development of Solutions (EAC 3)	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 (WK5)
4	Investigation (EAC 4)	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 (WK8)
5	Tool Usage (EAC 5)	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, (WK2 and WK6)
6	The Engineer and the World (EAC 6)	Analyze and evaluate sustainable development impacts to: society, the economy, sustainability, health and safety, legal frameworks, and the environment, in solving complex engineering problems (WK1, WK5, and WK7)
7	Ethics (EAC 7)	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 (WK9)
8	Individual & Collaborative Team Work (EAC 8)	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 (WK9)
9	Communication (EAC 9)	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
10	Project Management and Finance (EAC 10)	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
11	Life Long Learning (EAC 11)	Recognise the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change (WK8)

STUDY PLAN

YEAR 1

Sem.	Course Code	Course Name	Credit
1	UQI10102	*Islamic Studies (local muslim)	2
	UQI10202	*Moral Studies (local non-muslim)	2
	UQI10902	**Islam in Malaysia (international)	2
	UQI11002	**Moral and Professional Ethics (international)	2
	UQU11202	*Integrity and Anti-Corruption (local)	2
	UQU12302	**Citra Malaysia (international)	2
	UHB14202	**Bahasa Melayu Komunikasi 2 (international)	2
	BEE12202	Occupational Safety and Health	2
	BEE11203	Ordinary Different Equations	3
	BEJ10102	Computer Programming	2
	BEJ10303	Electric Circuit I	3
	BEJ10702	Instrumentation and Measurement	2
	BEJ10801	Fundamental Electronics Laboratory	1
	Total		**17**

Sem.	Course Code	Course Name	Credit
2	UHB13102	English for General Communication	2
	UQU12102	*Aspira Negara Bangsa (local)	2
	UQI11902	*Philosophy and Current Challenges (local)	2
	UQU12002	**Integrity and Anti-Corruption (international)	2
	BEE20303	Multivariable Calculus	3
	BEJ10403	Electric Circuit II	3
	BEJ10503	Analog Electronics	3
	BEJ10603	Digital Electronics	3
	Total		**18**

YEAR 2

Sem.	Course Code	Course Name	Credit
3	UQ*1XXX1	Co-Curriculum I	1
	UHB1XX02	*Foreign Language (local)	2
	UHB24202	**Bahasa Melayu Komunikasi 4 (international)	
	BEE22402	Creativity and Innovation	2
	BEE32402	Numerical Methods	2
	BEJ20503	Control Systems	3
	BEJ20203	Signals and Systems	3
	BEJ20701	Electronic Engineering Laboratory I	1
	BEJ23002	Programming Language for IC Design	2
	Total		**16**

Sem.	Course Code	Course Name	Credit
4	UQ*1XXX1	Co-Curriculum II	1
	UHB23102	English for Technical Communication	2
	BEE22503	Engineering Economic and Entrepreneurship	3
	BEE32502	Engineering Statistics	2
	BEJ20303	Electromagnetic Fields and Waves	3
	BEJ20603	Power Systems	3
	BEJ20801	Electronic Engineering Laboratory II	1
	BEJ33103	Fundamental of Semiconductor	3
	Total		**18**

YEAR 3

Sem.	Course Code	Course Name	Credit
5	BEE32302	Engineers and Society	2
	BEJ30103	Electronic Communication Systems	3
	BEJ30701	Engineering Practices	1
	BEJ30801	Electronic Engineering Laboratory III	1
	BEJ31303	Microprocessor and Computer Organisation	3
	BEJ30403	Electronic Circuits Analysis and Design	3
	BEJ30503	Digital Design	3
	Total		**16**

Sem.	Course Code	Course Name	Credit
6	UHB33102	English for Professional Communication	2
	BEJ30103	Engineering Management	3
	BEE32603	Integrated Design Project	3
	BEJ30603	Digital Signal Processing	3
	BEJ43103	VLSI System	3
	BEJ43203	Micro Fabrication	3
	BEJ40401	Electronic Engineering Laboratory IV	1
	Total		**18**

Sem.	Course Code	Course Name	Credit
	BEE32205	Industrial Training	5
	Total		**5**

YEAR 4

Sem.	Course Code	Course Name	Credit
7	BEE40602	Final Year Project I	2
	BEJ43113	Embedded System with SoC	3
	BEJ43903	Analog IC Design	3
	BEJ40401	Electronic Engineering Laboratory IV	1
	BEJ4xxxx3	Elective Course I	3
	BEJ4xxxx3	Elective Course I	3
	Total		**14**

Sem.	Course Code	Course Name	Credit
8	BEE40704	Final Year Project II	4
	BEJ43503	IC Packaging	3
	BEJ43122	Advanced Physical Design	2
	BEJ43001	Microelectronic Engineering Laboratory	1
	XXXxxxx3	Elective Course I/II/III	3
	Total		**13**

ELECTIVE COURSES – Semiconductor and Integrated Circuit Design Specialisation

Compulsory Courses

Course Code	Course Name	Credit
BEJ23002	Programming Language for IC Design	2
BEJ30403	Electronic Circuits Analysis and Design	3
BEJ30503	Digital Design	1
BEJ33103	Fundamental of Semiconductor	3
BEJ40401	Electronic Engineering Laboratory IV	1
BEJ43001	Microelectronic Engineering Laboratory	1
BEJ43103	VLSI System	3
BEJ43203	Micro Fabrication	3
BEJ43903	Analog IC Design	3
BEJ43113	Embedded System with SoC	3
BEJ43122	Advanced Physical Design	3
BEJ43503	IC Packaging	2

Elective Course I (Choose two)

Course Code	Course Name	Credit
BEJ43303	Advanced Semiconductor Devices	3
BEJ43403	MEMS Technology	3
BEJ43603	Material Characterization	3
BEJ43703	Nanoelectronic Devices	3
BEJ43803	Reliability and Testability in IC Device	3
BEJ43133	Design for Test	3
BEJ43143	Photonic Devices	3
BEJ43303	Advanced Semiconductor Devices	3
BEJ43403	MEMS Technology	3

ELECTIVE COURSES – FOR ALL SPECIALISATION

Elective Course II (Master General)

Course Code	Course Name	Credit
MEE10103	Advanced Engineering Mathematics	3
MEE10203	Programmable Electronic	3
MEE10303	Advanced Digital Signal Processing	3
MEE10403	Computational Intelligence	3
MEE10603	Advanced Power Electronics	3

ELECTIVE COURSES – FOR ALL SPECIALISATION

Elective Course III (General)

Course Code	Course Name	Credit
EEF40103	Introduction to Big data	3
EWF40103	Data Science and Applications	3
BEE41103	HCIA Routing and Switching	3
BEE41203	HCIA Cloud Computing	3
BEE41303	HCIA Artificial Intelligence	3
UQU40103	Professional at Work	3
BEE41503	Photovoltaic	3
BEE41403	Electric Vehicles	3
EWF40203	Data Visualisation	3
EIF40103	Machine Learning	3
BEJ44173	Electrical Machines	3
BEE41703	Business Start-up and Technopreneurship	3

Synopsis of Compulsory University Courses

UHB 13102 English for General Communication

Synopsis:
This course aims to develop students' existing English Language skills. Through guided and independent learning activities, students will develop their skills in reading, listening, writing and speaking. At the end of the course, students should be able to recognize relevant information in texts on topics of interest and students should also be able to write on familiar topics. Furthermore, this course will provide students with opportunities to enhance their listening and speaking skills.

References:

1 Council of Europe (2023). Common European Framework of Reference for Languages: Learning, Teaching, Assessment – Companion Volume. Retrieved from https://rm.coe.int/common-european-framework-of-reference-for-languages-learning-teaching/16809ea0d4
2 Cambridge University Press (2023). English Grammar in Use: A Self-study Reference and Practice Book for Intermediate Learners of English.Retrieved from https://www.cambridge.org/elt/resources/grammar-in-use
3 Oxford University Press (2023). Oxford Learner's Dictionary of Academic English.Retrieved from https://www.oxfordlearnersdictionaries.com/ Cambridge Assessment English (2025). B1 Preliminary.Retrieved from https://www.cambridgeenglish.org/exams-and-tests/preliminary/
4 National Geographic Learning (2025). Pathways: Listening, Speaking, and Critical Thinking – Intermediate Level. Retrieved from https://www.eltngl.com/pathways TESOL International Association (2025). TESOL Resource Center. Retrieved from https://www.tesol.org/resource-center/

UHB 23102 English for Technical Communication

Synopsis:
This course introduces students to basic information of technical communication such as technical definition and description by using high degree of grammatical control. At this level, students will be exposed to the different types of proposal writing. In addition, students will also learn about the components of technical documents. Finally, students are also expected to execute and present an event.

Pre-requisite: A pass in English for General Communication

References:

1 Newby, P. (2014). Research methods for education. (2nd ed.). Abingdon: Routledge. LB1028.N48 2014.
2 Paige, W. (2015). The least you should know about English: Writing skills. Stamford, CT: Cengage Learning. PE1408 .G43 2015
3 Randall, V. (2015).The college writer: A guide to thinking, writing, and researching. Australia : Wadsworth. PE1408 .C64 2015
4 Sekaran, U. (2013). Research methods for business: A skillbuilding approach. (6th ed.). Chichester, West Sussex: Wiley. HD30.4.S44 2013.

UHB 33102 English for Professional Communication

Synopsis:
This course equips students with the necessary English language skills to communicate effectively and professionally in workplace settings. It enhances students' written and oral communication through professional etiquette, structured meetings, and persuasive pitching techniques. Through practical exercises and real-world scenarios, students will develop confidence in writing professional documents, participating in meetings, and delivering impactful presentations. The course also emphasises interpersonal communication, active listening, and the ability to engage diverse audiences in professional contexts.

Pre-requisite: A pass in English for Technical Communication

References:

1 Challender, J. (Ed.). (2022). Professional ethics in construction and engineering. John Wiley & Sons Ltd. https://doi.org/10.1002/9781119832119
2 Glückler, J., Winch, C., et al. (2023). Professions and proficiency (1st ed.). Springer International Publishing AG. (Knowledge and Space Series)
3 Mullany, L., & Schnurr, S. (Eds.). (2022). Globalisation, geopolitics, and gender in professional communication. Routledge. [eBook]. Retrieved from eBook Collection (EBSCOhost).
4 Price, H., & McIntyre, D. (2023). Communicating linguistics: Language, community and public engagement (1st ed.). Taylor & Francis Group.
5 Räisänen, T., Hynninen, N., & Kankaanranta, A. (2022). English as a business lingua franca. In Reference module in social sciences. Elsevier. [eBook].
6 Schauer, G. A. (2024). Intercultural competence and pragmatics. Palgrave Macmillan. https://doi.org/10.1007/978-3-031-44472-2

UHB 14202 **Bahasa Melayu Komunikasi 2 (International students)

Synopsis:

This course is designed for international students to communicate in basic Malay in daily situations. Students are exposed to speaking and writing in simple Malay. Teaching and learning will be delivered through lecture, tutorial, assignment and indoor or outdoor experiential learning. At the end of this course, students will be able to speak and write using simple sentences effectively.

References:

1 Yong, C. C., Rohaidah Mashudi, Maarof Abd Rahman. (2012). Bahasa Kebangsaan untuk Pelajar Luar Negara: Malay Language for International Students. Petaling Jaya: Pearson Malaysia.
2 Zarina Othman, Roosfa Hashim & Rusdi Abdullah. (2012). Modul Komunikasi Bahasa Melayu Antarabangsa, KPT. Penerbit UKM Press.
3 Mardian Shah Omar. (2016). Perbualan Mudah Bahasa Melayu Untuk Pelancong Asing. Kuala Lumpur: Dewan Bahasa dan Pustaka
4 Nik Safiah Karim, Farid M. Onn, Hashim Haji Musa dan Abdul Hamid Mahmood. (2004). Tatabahasa Dewan, Edisi Baru. Kuala Lumpur: Dewan Bahasa dan Pustaka.
5 Norhashimah Jalaluddin, Mardian Shah Omar dan Norzilawati Jais. (2006). Bahasa Melayu untuk Penutur Asing. Buku 1 dan 2. Kuala Lumpur: Dewan Bahasa dan Pustaka.

UHB 1XX02 Foreign Language

Synopsis:

Students will need to register only ONE (1) foreign language course throughout their study. Wide selection is available such as Mandarin, Spanish, Japanese, Arabic, German and French.

***All courses related to English and Foreign Language are conducted by Centre for Language Studies (CLS, UTHM). Kindly visit their website or contact for more information.*

UQI10102 Islamic Studies (local muslim students)

Synopsis:

This course explains about Islamic concept as ad-deen. It discusses the study of al-Quran and al-Hadith, Sunnism, schools of Islamic theology, development of schools of Fiqh, principles of muamalat, Islamic Criminal Law, Islamic work ethics, issues in Islamic family law and current issues.

References:

1 Harun Din (Dr.) (2001), Manusia Dan Islam, cetakan pertama, Kuala Lumpur: Dewan Bahasa dan Pustaka. [BP174. M36 1990]
2 Mustafa Abdul Rahman (1998), Hadith 40, Kuala Lumpur: Dewan Pustaka Fajar. [BP135. A2 M87 1998]
3 Ismail Haji Ali, (1995), Pengertian dan Pegangan Iktikad yang benar: Ahli Sunnah Wal Jamaah: Kuala Lumpur: Penerbitan al-Hidayah. [BP166.78. P46 1995]
4 Paizah Haji Ismail (1991), Undang-undang Jenayah Islam, Kuala Lumpur: Dewan Pustaka Islam, Angkatan Belia Islam Malaysia. [BP144. P35 1991]
5 Mustafa Haji Daud (1989), Institusi Kekeluargaan Islam, Kuala Lumpur: Dewan Pustaka dan Bahasa. [BP188.3. F3.M87 1989]

UQI 11002 Moral and Professional Ethics (local non-muslim students)

Synopsis:
This course explains concepts of moral, aspects of moral and its importance in daily lives, Western moral theories and moral values of great religions of the world, moral values in work and current moral issues.

References:

1 Mohd Nasir Omar. (2010). Falsafah Akhlak, Penerbit Universiti Kebangsaan Malaysia, Bangi. [BJ1291 .M524 2010].
2 Hussain Othman. (2009). Wacana Asasi Agama dan Sains. Batu Pahat: Penerbit UTHM. [BL 240.3 H87 2009ª].
3 Hussain Othman, S.M. Dawilah Al-Edrus, Berhannudin M. Salleh & Abdullah Sulaiman. (2009). PBL Untuk Pembangunan Komuniti Lestari. Batu Pahat: Penerbit UTHM. [LB 1027.42 P76 2009a].
4 Eow Boon Hin. (2002). Moral Education. Longman. [LC268 .E48 2008].
5 Ahmad Khamis. (1999). Etika Untuk Institusi Pengajian Tinggi. Kuala Lumpur: Kumpulan Budiman. [LC315.M3 .A35 1999].

Courses listed below are also part of University requirement:

UQU11202	*Integrity and Anti-Corruption (local)
UQU12302	Citra Malaysia (international)
UQU12102	*Aspirasi Negara Bangsa (local)
UQI11902	*Philosophy and Current Challenges (local)
UQU12002	**Integrity and Anti-Corruption (international)
UQ* 1XXX1	Co-Curriculum I
UQ* 1XXX1	Co-Curriculum II

***All courses related to Social Science, Co-Curriculum and Islamic Studies are conducted by Centre for General Studies and Co-Curricula (PPUK, UTHM). Kindly visit their website or contact them for more information.*

Synopsis of Mathematics Courses

BEE 11203 Ordinary Differential Equations

Synopsis:
This course is mainly about the study of mathematical concepts through the use of knowledge of differential equations. First, students will be introduced to the concept of differential equations including the first order differential equation, second order differential equation and system of first-order differential equations. Then, the concept of series solution for differential equations. Next, students will be introduced to the techniques of Laplace transform for solving differential equations.

References:

1 Tay Kim Gaik, Sharifah Saon, Jong Siat Ling, Elfarizanis Baharudin (2022). Ordinary Differential Equations, UTHM Edition
2 Claycomb, James R. (2018). Mathematical Methods for Physics – Using MATLAB and Maple - 5.8.4.3 Direction Field and Phase Portrait. Mercury Learning and Information. Retrieved from https://app.knovel.com/hotlink/pdf/id:kt011Q8X73/mathematical-methods/direction-field-phase"
3 "Engineering Mathematics Group. (2018). Mathematics Formulae for Engineers and Scientists. Penerbit Universiti Sains Malaysia. Retrieved from https://app.knovel.com/hotlink/toc/id:kpMFES0001/mathematics-formulae/mathematics-formulae"
4 Pal, Srimanta Bhunia, Subodh C. (2015).Engineering Mathematics. Oxford University Press. Retrieved from https://app.knovel.com/hotlink/toc/id:kpEM000007/engineering-mathematics/engineering-mathematics
5 Tenenbaum, Morris Pollard, Harry. (1963). Ordinary Differential Equations - An Elementary Textbook for Students of Mathematics, Engineering, and the Sciences.</i> Dover Publications. Retrieved from https://app.knovel.com/hotlink/toc/id:kpODEAETS3/ordinary-differential/ordinary-differential

BEE 20303 Multivariable Calculus

Synopsis:
This course aims to equip students with the knowledge of Functions of Several Variables, Coordinate Systems, Multiple Integrals and Vector Calculus, as the basic knowledge to support their engineering courses.

References:

1 Mendelson, Elliott (2022). Schaum's Outline of Calculus. 7th ed. New York: McGraw Hill. https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781264258338
2 James Stewart, Daniel Clegg, and Saleem Watson (2021). Calculus: Metric Version. 9th ed. USA: Cengage Learning.
3 Deborah Hughes-Hallett, Andrew M. Gleason, William G. McCallum (2021). Calculus: Single and Multivariable, 8th ed. USA: Wiley
4 Lipschutz, Seymour, John Liu, and Murray R. Spiegel (2018). Schaum's Outline: Mathematical Handbook of Formulas and Tables. 5th ed. New York: McGraw-Hill Education. https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781260010534
5 Robert T. Smith, and Roland B. Minton (2012). Calculus Early Transcendental Function (3rd Edition). New York: McGraw-Hill (QA303.2 .S644 2012)
6 Wrede, Robert, and Murray Spiegel (2010). Schaum's Outline of Advanced Calculus. 3rd ed. New York: McGraw-Hill. [Call number: QA303.2 .W74 2010] https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9780071623667

BEE 32402 Numerical Methods

Synopsis:
This course introduces several techniques to solve mathematical engineering problems using numerical estimation and requires an elementary knowledge of functions and linear algebra. It begins with an introduction to a computational method, followed by discussing the several algorithms to solve a linear and a non-linear equation. An analysis using numerical methods on differentiation and integration equations also will be introduced. Besides, an estimation technique using the extrapolation method will be taught to improve result accuracy.

References:

1 Kim Gaik Tay, Chang Phang, Piau Phang (2022). Numerical Methods with CASIO FX-570EX CLASSWIZ CALCULATOR, Penerbit UTHM.
2 Esfandiari, Ramin S (2017). Numerical methods for engineers and scientists using MATLAB – 2nd ed. CRC Press, Taylor & Francis Group. [Library call no.: TA335. E84. 2017]
3 Petras, Ivo. (2016). Advances in numerical methods in engineering with MATLAB. Auris Reference Ltd. [Library call no.: QA297. A38. 2016]
4 Chapra, Steven C. (2015). Numerical methods for engineers – 7th ed. McGraw-Hill Education. [Library call no.: TA345. C42. 2015]
5 Qingkai Kong, Timmy Siauw ,Alexandre M.Bayen (2020).Phyton Programming and Numerical Methods: A Guide for Engineers and Scientists, https://www-sciencedirect-com.ezproxy.uthm.edu.my/book/9780128195499/python-programming-and-numerical-methods

BEE 32502 Engineering Statistics

Synopsis:
This course introduces the concept of statistics to be applied in engineering applications. Topics covered in this course include sampling distributions, estimation, hypothesis testing, and linear regression. Relevant software will be used to perform statistical analysis to generate conclusions based on the given data.

References:

1 James T. McClave (2013). Statistics (12th Edition). Pearson. QA276.12 .M34 2013
2 William Navidi (2015). Statistics for engineers and scientists (4th edition). McGraw-Hill. QA276.4 .N38 2015
3 Ronald E. Walpole (2016). Probability and statistics for engineers and scientists (9th edition)). Pearson. TA340 .P79 2016
4 Deborah J. Rumsey (2019). Statistics essential for dummies. John Wiley and Sons. Online: https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=5751855&query=

Synopsis of Core Faculty Courses

BEE 12202 Occupational Safety and Health

Synopsis:
This course introduces students to knowledge and skills in occupational safety and health in the workplace. Scope of study includes Health, Safety and Environment Managements: Introduction to OSH, OSHA 1994 (Act 514), FMA 1967, EQA 1974, Occupational Safety and Health Management System, Safety, Health and Environment Culture; Risk Management and Assessment: Introduction to Risk Management, Risk Assessment Techniques, HIRARC; Physical Injury & Controls: Introduction to Physical Injury, Construction Work, Electrical Work, Mechanical Work, Chemical Work; Health Hazards: Introduction to Health Hazards & Hygiene, Chemical Hazards, Physical Hazards, Biological Hazards, Hygiene; Accident Investigation & Reporting: Introduction, Accident Investigation, Investigations and Causes of Incident, Incident Analysis and Data Collection Method..

References:

1 Occupational Safety and Health Act and Regulations. MDC Publishers Printer Sdn. Bhd. 2001. Call number: KPG1390.M34 2001 rw N2.
2 Factories and Machinery Act & Regulations. MDC Publishers Printer Sdn. Bhd. 2001. Call number: KPG1390.A31967 .A4 2001 rw N1.
3 Ismail Bahari. (2006). Pengurusan Keselamatan dan Kesihatan Pekerjaan. Edisi ke-2. McGraw Hill Education (Malaysia). Call number: T55.I85 2006.
4 Davies, V. J. and Tomasin K. (2006). Construction Safety Handbook. 2 nd ed. Thomas Telford. Call number: TH443.R43 2006.
5 Anton, Thomas J. (2009). Occupational Safety and Health Management. 3rd ed. McGraw-Hill. Call number: T55.A57 1989.

BEE 22402 Creativity and Innovation

Synopsis:
This course focuses on developing a creative person who will eventually think strategically, creatively and critically. The knowledge and skills acquired throughout the course will later be applied by the students in solving problems and making decisions in the future. In this course, students will be exposed to various creativity and problem solving techniques. Some of the skills to be covered throughout the course are problem solving, techniques in creativity and techniques in innovation. Students will also be participating in exhibitions and competitions. This course will also cover the industry needs by introducing them to the TRIZ concepts.

References:

1 Gadd, Karen (2011), TRIZ for engineers: enabling inventive problem solving, ISBN 9780470741887, (T212 .G32 2011).
2 Savransky, Semyon D.(2000), Engineering of creativity : introduction to TRIZ methodology of inventive problem solving ISBN 9780849322556 (TA153 .S28 2000)
3 Terninko, John (1998), Systematic innovation : an introduction to TRIZ ; (theory of inventive problem solving) ISBN 9781574441116 (HD30.29 .T47 1998)
4 Rantanen, Kalevi, Simplified TRIZ: new problem-solving applications for engineers and manufacturing ISBN 9781574443233 (TA153 .R36 2002 n.1)

BEE 22503 Engineering Economics and Entrepreneurship

Synopsis:
This course covers topics about engineering economics and entrepreneurship. On the engineering economics aspect, the course starts with the analysis of engineering economics and subsequently the principles and application of money-time relationships. On the other hand, this course considers various topics related to basic entrepreneurship including introduction to technology entrepreneurship, business plan and ownership, new product development and intellectual properties, technology commercialization and managing business.

References:

1 DeGarmo, E. Paul (1997). Engineering Economy, Prentice-Hall, TA177.4. E63. 1997.
2 Sullivan, William G. (2009). Engineering Economy, PearsonI, TA177.4 .S94 2009.
3 Kamariah Ismail, Noraini Abu Talib, Mohd. Hassan et al. (2009). Technology Entrepreneurship, Prentice-Hall. Call number HD45 .T44 2009.
4 UiTM Entrepreneurship Study Group (2004). Fundamentals of Entrepreneurship, revised edition, Prentice-Hall. Call number HB615 .F86 2004.
5 Bruce R. Barringer, R. Duane Ireland (2010). Entrepreneurship: successfully launching new ventures, 3rd Edition. Prentice-Hall. Call number HB615 .B37 2010.
6 Charles E. Bamford, Garry D. Bruton (2011). Entrepreneurship: a small business approach. New York: McGraw-Hill. Call number HD62.5 .B35 2011.
7 Schaper M., Volery, T, Weber, P., Lewix, K., (2011). Entrepreneurship and small business; 3rd Asia-Pacific Edition. John Wiley & Son. Call number HD2341 .E57 2011.
8 Jamal Nassar, (2018) Technopreneurship Financing & Startups Ecosystem: How Malaysia Is Creating Another Success Story; Call number HD62.5 .J35 2018
9 Rambat Lupiyoadi, Kurniawan (2020) Technopreneurship, Penerbit Salemba Empat 2020.
10 Shelters David (2013) Start-Up Guide for the Technopreneur, John Wiley, Call number: HD62.37 .S43
11 Scaffidi, Federica; Micelli, Ezio; Nash, Matt (2025) The role of the social entrepreneur for sustainable heritage-led urban regeneration, Cities, Vol 158, March 2025. https://doi.org/10.1016/j.cities.2024.105670
12 Ascencio, Christine; Benmamoun, Mamoun; Katz, Jerome; Brinkmeier, Alex (2024) Enriching the Typology of Social Entrepreneurs: The Transnational Dimension. Administrative Sciences, Vol. 14, Issue 12, p335-350, https://doi.org/10.3390/admsci14120335
13 Shahnoel Noeh, Amirul; Rozaidah Pg Hj Idris, Pg; Anshari, Muhammad (2022) Decision Model in the Development of Technopreneurship and the Adoption of IR4.0 Technologies, International Conference on Decision Aid Sciences and Applications (DASA). https://doi.org/10.1109/DASA54658.2022.9765016

BEE 30103 Engineering Management

Synopsis:
This course introduces students to the role of engineer in management principles that are applied in engineering projects and organization. Students learn the basics of managing people and responsibilities as an engineering manager. The management functions consist of planning, organizing, leading and controlling also the management tools which comprises taguchi, kaizen, enterprise resource planning (ERP) and six-sigma are exposed to the students. Other elements such as quality management, project management and its activities, lean production, maintenance and reliability are also included in this course.

References:

1 Lucy C. Morse, Daniel L Babcock (2007), Managing Engineering and Technology, 4th Edition, Upper Saddle River, Pearson. Call Number TA190 .M68 2007.
2 C. M. Chang (2005), Engineering Management: Challenges in the New Millennium, Upper Saddle River, Pearson. Call Number TA190 .C42 2005.
3 Avraham Shtub, Jonathan F. Bard, Shlomo Globerson (2005), Project Management: Processes, Methodologies and Economics, 2nd Edition, Upper Saddle River, Pearson. Call Number TA190 .S57 2005.
4 4.John V. Chelsom, Andrew C. Payne (2004), Management for Engineers, Scientists and Technologists, 2nd Edition, Hoboken, John Wiley. Call Number TA190 .C44 2005.
5 Abdul Talib Bon (2010), Pengurusan Kejuruteraan, Batu Pahat, Penerbit KUiTTHO. Call Number TA190 .A22 2010 a.

BEE 32302 Engineer and Society

Synopsis:
To provide knowledge and understanding about the importance of ethics in the engineering profession, and to develop qualities and skills required by engineers to perform their roles and responsibilities competently for the benefit of mankind and nature.

References:

1 Kemper, J.D., Sanders, B.R. Engineers and Their Profession (5th Edition), Oxford University Press; New York, 2001. (TA157 .K45 2001)
2 Harris, C.E., Pritchard, M.S., Rabis, M.J., James, R., Englehardt, E., Engineering Ethics: Concepts and Cases, (6th Edition) Wadsworth Cengage Learning, Massachusetts, 2018. (TA157 .H37 2018).
3 Vesilind, P.A., Gunn, A.S., Hold Paramount: The Engineer's Responsibility to Society (3rd Edition), Cengage Learning, Stamford, 2016 (TA157 .G86 2016)
4 Babcock, D.L., Managing Engineering and Technology: An Introduction to Management for Engineers (7th Edition), Prentice Hall, Englewood Cliffs, New Jersey, 2019 (TA190 .32 2019)
5 Schinzinger, R., Martin, M.W., Introduction to Engineering Ethics (2nd Edition), McGraw-Hill, 2009 (TA157 .S43 2009).

Synopsis of Core Programme Courses

BEJ 10102 Computer Programming

Synopsis:
This course provides comprehensive programming concepts through the use of high-level programming languages such as C language. After completing this course, student should be able to design, code, debug, test and document well-structured programs based on technical or real engineering problems.

References:

1 Harper. A, Ryan.L, Stephen. S, Michael B., Daniel F., Huáscar T., and Moses F. (2022). Programming Survival Skills. Chap. 2 in Gray Hat Hacking: The Ethical Hacker's Handbook. 6th ed. New York: McGraw-Hill. https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781264268948/chapter/chapter2
2 Boussaha, K., Hanneche, A., & Chaoua, Z. (2022). Computer Programming Practical Works Activities: From Human to Automatic Scoring. In J. Zhao & J. Richards (Eds.), Virtual Technologies and E-Collaboration for the Future of Global Business (pp. 154-181). IGI Global. https://doi-org.ezproxy.uthm.edu.my/10.4018/978-1-6684-5027-7.ch009
3 Management Association, I. (Ed.). (2021). Research Anthology on Recent Trends, Tools, and Implications of Computer Programming. IGI Global. https://doi-org.ezproxy.uthm.edu.my/10.4018/978-1-7998-3016-0
4 4. King, K.N.(2008).C Programming: A Modern Approach. 2nd ed. New York: W.W.Norton. Call number:QA76.73.C15.K562008 5. Jeri R. Hanly and Elliot B. Koffman (2004). Problem Solving and Program Design in C. 4th ed. USA: Addison-Wesley. Call number: QA76.73.C15 .H364 2004

BEJ 10303 Electric Circuits I

Synopsis:
This course covers the basic theory of circuit analysis. Topics include basic electrical circuit theory and laws, electrical circuit analysis techniques and concepts, network theorems, review of techniques to solve simultaneous equations, nodal and mesh circuit analysis, dependent sources, Thevenin's and Norton's equivalent circuits, and maximum power transfer.

References:

1 Alexander, C. K. & Sadiku, M.N.O.; Fundamentals of Electric Circuits; McGraw-Hill 5 th Editions; Call number : TK454.A43 20138.
2 J. David Irwin; Basic Engineering Circuit Analysis, 8th Ed.; John Wiley & sons; 2005. Call number: TK454 .I78 2005.
3 James W. Nilsson & Susan A. Riedel; Electric Circuits; Prentice-Hall; 2008. Call number: TK454 .N54 2011.
4 William H Hayt & Jack E Kemmerly, Engineering Circuit Analysis, McGraw Hill, 2002. Call number: TK454 .I78 2011.
5 James W. Nilsson & Susan A. Riedel; Introductory circuits for electrical and computer engineering; Prentice-Hall 2008. Call number: TK7867 .N54 2002.

BEJ 10403 Electric Circuits II

Synopsis:
The course has been designed to apply the techniques and principles of electrical circuit analysis to solve DC and AC circuits. Topics in this course includes energy storage elements, transient and steady-state responses of RC, RL and RLC circuits; complex impedance, circuits with DC and sinusoidal sources, steady-state power and power factor correction. Two-port network topic is also introduced for advanced circuit analysis.

Pre-requisite: BEJ 10303 Electric Circuits I

References:

1 Alexander, C. K. & Sadiku, M.N.O.; Fundamentals of Electric Circuits; McGraw-Hill 5 th Editions; Call number : TK454.A43 2013.
2 J. David Irwin; Basic Engineering Circuit Analysis, 8th Ed.; John Wiley & sons; 2005. Call number: TK454 .I78 2005.
3 James W. Nilsson & Susan A. Riedel; Electric Circuits; Prentice-Hall; 2008. Call number: TK454 .N54 2011.
4 William H Hayt & Jack E Kemmerly, Engineering Circuit Analysis, McGraw Hill, 2002. Call number: TK454 .I78 2011.
5 James W. Nilsson & Susan A. Riedel; Introductory circuits for electrical and computer engineering; Prentice-Hall 2008. Call number: TK7867 .N54 2002.

BEJ 10503 Analog Electronics

Synopsis:
This course provides the fundamental knowledge in analog electronic. It encompasses basic electronic semiconductor devices such as diode, bipolar junction transistor (BJT), field effect transistor (FET). The emphasis is on the design aspects and applications which include the amplifier design based on single and multi-stage, frequency response analysis of amplifiers, and power amplifier. The course has been designed to provide basic analog electronic skills covering theories and practices.

Pre-requisite: BEJ 10103 Electric Circuits I

References:

1 R.Boylestad, L. Nashelsky; Electronic Devices and Circuit Theory, 11th Ed.; Prentice Hall; 2013. Call number: TK7867 .B69 2013
2 Donald A. Neamen; Microelectronics Circuit Analysis and Design, 4th Ed.; McGraw Hill, 2010. Call number: TK7867 .N434 2010
3 Louis E Fretzel; Contemporary Electronics: Fundamentals, Devices, Circuits, and Systems; McGraw-Hill; 2014. Call number: TK7816 .F75 2014
4 Albert Paul Malvino, David J. Bates, Electronic Principles, 7th Ed., McGraw Hill, 2007. Call number: TK7816 .M34 2007
5 Thomas L. Floyd, Electronics Fundamentals: Circuits, Devices and Applications, 8th Ed., Prentice Hall, 2013. Call number: TK7816 .F56 2007
6 Robert T.Paynter; Introductory Electronics Devices and Circuits: Conventional Flow Version, 7th Ed., Pearson, 2006. Call number: TK7871.85 .P39 2006
7 Thomas L. Floyd, Electronic Devices, 7th Ed., Prentice Hall, 2005. Call number: TK7870 .F53 2005
8 Shriram K. Vasudevan, Sumana Ravi Ganeson, Jai Vighneshwar Jayakumar, Pradeep Kumar; Integrated Electronics; Alpha Science International Ltd.; 2015. Call number: TK7819 .I57 2015.

BEJ 10603 Digital Electronics

Synopsis:
The course begins with the introduction to digital systems, followed by representation of physical values in digital form. The basic logic gates and symbols are introduced covering Boolean expressions, truth tables and timing diagrams. Combinational logic gates is implemented in certain function, analyzing circuits to obtain its Boolean expression followed by logic simplification using Boolean theorem and Karnaugh-map approach. In digital arithmetic system, adder circuits are introduced, starting from half adder, full adder and the design of the carry look-ahead adder and BCD adder. Then, on to MSI logic circuits such as encoder, decoder, multiplexer and demultiplexer. Memory elements such as latches and flip-flops are introduced followed by the related flip-flop applications.

References:

1 Floyd, Digital Fundamental, Merill MacMillan, 2009. Call number: TK7868.D5 .F564 2009.
2 J. Tocci, Digital System, Principles and Application, Prentice Hall, 2011. Call number: TK7868.D5 .T62 2011.
3 M. Morris Mano, Charles R. Kime, Logic and Computer Design Fundamentals, 4th Ed., Prentice Hall, 2008. Call number: TK7888.4 .M36 2008.
4 Ferdjallah, Mohammed, Introduction to digital systems: modeling, synthesis, and simulation using VHDL /
5 Kharate, G. K., Digital electronics, New Delhi: Oxford University Press, 2010. Call number: TK7868.D5 .K42 2010.

BEJ 10702 Instrumentation and Measurement

Synopsis:

This course is about the work principles of various measuring instruments. The students are first introduced with bridge measurement. Next, types of sensors and transducers, their characteristics and applications are discussed. Application of measurement systems is also dealt with. Finally, the students are taught about the digital instrumentation components.

References:

1 J. P. Bentley, Principles of Measurement System, 3 rd Edition. Pearson Prentice Hall, 1995. Call number: QC53 .B46 1995.

2 R. G. Gupta, Electronic Instruments and Systems: Principles, Maintenance and Troubleshooting, McGraw Hill, 2001. Callnumber: TK7870.2 .G86 2001.

3 L. D. Jones, and C. A. Foster, Electronic Instruments and Measurements. Prentice Hall International Edition, 1991. Call number: TK7878.4 .J66 1991.

4 D. A. Bell, Electronic Instrumentation and Measurements, 2nd Edition. Prentice Hall Career and Technology, 1994. Call number: TK7878 .B45 1994.

BEJ 10801 Fundamental Electronics Laboratory

Synopsis:

This course comprises of practical implementation for the subject of BEJ 10303 Electric Circuits I and BEJ 10702 Instrumentation and Measurement, as well as introductory to electronic laboratory practice.

References:

1 Ida, Nathan,Sensors, actuators, and their interfaces: a multidisciplinary introduction, SciTech Publishing, 2014, Call number TA165 .I32 2014

2 Seksena, S.B Lal, Fundamentals of Electrical Engineering, Cambridge University Press, 2016.Call number TK146 .S44 2016

3 Alexander, Charles K, Fundamentals of electric circuits, McGraw-Hill, 2013. Call number TK454 .A43 2013

BEJ 20203 Signals and Systems

Synopsis:
This course is an introduction to signals and systems. It is important for students to gain good understanding on the characteristics of signals and systems in time and frequency domains. The topics of this subject are Introduction to Signals and Systems, Fourier series, Fourier Transform, and Laplace Transform. In each topic, the concepts will initially be presented followed by the applications. It is expected that the students should be able to apply the knowledge and experience gained in this subject for better understanding of courses at higher levels.

Pre-requisite: BEE 11203 Ordinary Differential Equation
BEJ 10303 Electric Circuits I

References:

1 Jong Siat Ling, Abul Khair Anuar, Ansar Jamil, Norshidah Katiran, Shipun Anuar Hamzah. (2023). Signals and Systems. UTHM Publisher.
2 Hsu, Hwei P. (2020). Schaum's Outline of Signals and Systems (4th Edition). New York: McGraw-Hill Education. [https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781260454246]
3 Mahmood Nahvi. Signals and Systems. (2014). McGraw-Hill.\Call number : TK5102.9.N33 2014.
4 S. Poornachandra and B. Sasikala. (2010). Signals and Systems. 3rd Edition, Tata McGraw Hill Education Private Limited, Call Number: QA402.P66.
5 A. V. Oppenheim, Alan S. Willsky and S. Hamid Nawab. (2014). Signals and Systems. 2nd Edition, New Jersey: Prentice-Hall, Call Number: QA402 .O66 2014.
6 Nagoor Kani. Signals and Systems, Tata McGraw Hill Education Private Limited. (2010). Call Number: TK5102.9.K36 2010.
7 Alexander D. Poularikas. (2007). Signals and Systems Primer with MATLAB. CRC Press 2007. Call Number: TK5102.9 .P68 2007.
8 Delores M Etter. (2005). Introduction to MATLAB 7, Prentice Hall. Call Number: TA345 .E876 2005.
9 Chi-Tsong Chen. (2004). Signals and Systems. Oxford University Press. Call Number: QA402.
10 Simon Haykin and Barry V. Veen. (2003). Signals and Systems, Wiley & Sons. Call Number: TK5102.5 .H39 2003

BEJ 20303 Electromagnetic Fields and Waves

Synopsis:
This course is to introduce the fundamental of electromagnetic including electrostatic, magnetostatic and electromagnetic waves. The main laws governing the electrostatic and magnetostatic will be discussed thoroughly.

Pre-requisite: BEE 20303 Multivariable Calculus

References:

1 Element of Electromagnetic, Matthew M.O.Sadiku, 4th Edition, Oxford University Press, 2001 (Repr. 2003).Call Number: QC760.S324 2007.
2 Elements of Engineering Electromagnetics, Sadiku, Matthew N. O. New York: Oxford University Press, 2001 (Repr. 2003) Call Number: QC760 .S324 2001.
3 Fundamentals of Applied Electromagnetics, Fawwaz T. Ulaby, Prentice Hall, 6th Ed., 2010. Call Number: QC760.U42 2010.
4 Engineering Electromagnetics, William H. H, McGraw-Hill, 7th ed.: McGraw-Hill, 2006. Call Number: QC670 .H39 2006.
5 Electromagnetics for Engineers, Fawwaz T. Ulaby, Pearson Education, 2005.Call Number: QC760 .U424 2005
6 Fundamentals of engineering electromagnetics, Bansal, Rajeev, Boca Raton, FL: Taylor & Francis, 2006.Call Number: QC760 .F86 2006.

BEJ 20503 Control Systems

Synopsis:
This course is about fundamental concepts of solving control systems problem. This course is organised in seven chapters. Chapter 1 presents an introduction to control systems. Chapter 2 provides introduction to Laplace transforms, transfer function, and mathematical modelling of dynamical systems (mechanical, electrical and electronic systems). Chapter 3 presents stability analysis of control systems and followed with chapter 4 which describes the time domain analysis of control systems. Chapter 5 and chapter 6 treats root locus method and frequency domain analysis respectively to analyze control systems while Chapter 7 deals with the basic properties of controllers including PID controller design.

Pre-requisite: BEE 11203 Ordinary Differential Equation

References:

1 N. S. Nise. Control Systems Engineering, 6th Ed. John Wiley, 2011. Call number: TJ213 .N57 2011.
2 R. C. Dorf and R. H. Bishop. Modern Control Systems, 11th Edition. Prentice Hall, 2008. Call number: TJ216 .D67 2008.
3 F. M. Golnaraghi and B. C. Kuo. Automatic Control System, 9th Ed. John Wiley, 2010. Call number: TJ213 .K86 2010.
4 M. Gopal. Control Systems: Principle and Design, 2 nd Edition. Tata McGraw Hill, 2002. Call number: TJ213 .G66 2002.
5 K. Ogata. Modern Control Engineering, 5th Edition, Prentice Hall, 2010. Call number: TJ213 .O32 2010.

BEJ 20603 Power Systems

Synopsis:
This course is arranged to provide students understanding of electrical power systems. The course is divided into three major parts: fundamental of single-phase and three-phase systems, the essential basic knowledge of single-phase and three-phase power systems will be covered at the beginning of the course. Subsequently, electric utility system comprises all the sources for power generation, accessories and auxiliaries used in it, transmission, and distribution of electric energy is also covered this section. Finally, the protection system will cover the safety and reliability of a power system.

Pre-requisite: BEJ 10303 Electric Circuits I

References:

1 J Theodore Wildi. Electrical Machines, Drives, and Power Systems, 6th Edition, Pearson Education International, 2006. Call Number TK2182 .W54 2006.
2 King Alexander C & Knight William. Uninterruptible Power Supplies and Standby Power Systems, McGraw-Hill, 2003. Call Number TK1005 .K56 2003.
3 Dugan Roger C, McGranaghan M F, Santoso S and Beaty H Wayne. Electrical Power Systems Quality, 3rd Edition, McGraw-Hill, 2012. Call Number TK1010 .E43 2012.
4 R.B. Theodore. Electrical Systems Design, Prentice Hall, 2003. Call Number TK3101 .B67 2003.
5 T. A. Short. Electric Power Distribution Equipment and Systems, Taylor & Francis Group, 2006. Call Number TK3091 .S56 2006.
6 Emadi, A, Nasiri, and S.B. Bekiarov. Uninterruptible Power Supplies and Active Filters, CRC Press, 2005. Call number: TK1005 .E49 2005.
7 K. Pethebridge and I. Neeson. Electrical Wiring Practice (Volume 2), 7th Edition, McGraw-Hill, 2012. Call Number: TK3201 .P47 2012 v. 2.
8 Hadi Saadat. Power System Analysis, 2nd Edition, Prentice Hall, 2002. Call Number: TK1011 .S33 2002.

BEJ 20701 Electronic Engineering Laboratory I

Synopsis:
To give students hands-on experience in understanding the material presented in BEJ10503 Analog Electronics and BEJ10603 Digital Electronics.

References:

1 R.Boylestad, L. Nashelsky; Electronic Devices and Circuit Theory, 11th Edition; Prentice Hall; 2013. Call number: TK7867 .B69 2013
2 Thomas L. Floyd, Electronics Fundamentals: Circuits, Devices and Applications, 8th Ed., Prentice Hall, 2013. Call number: TK7816 .F56 2007
3 Albert Paul Malvino, David J.Bates, Electronic Principles, 7th Ed. McGraw Hill, 2007. Call number: TK7816 .M34 2007
4 J. Floyd, Digital Fundamental, Merill MacMillan, 2009. Call number: TK7868.D5 .F564 2009
5 J. Tocci, Digital System, Principles and Application, Prentice Hall, 2011. Call number: TK7868.D5 .T62 2011
6 Kharate, G. K., Digital electronics, New Delhi: Oxford University Press, 2010. Call number: TK7868.D5 .K42 2010

BEJ 20801 Electronic Engineering Laboratory II

Synopsis:
This course comprises of practical implementation for the subject of Power System and Control System Theory. Various experiments are covered such as generator and transformer, overhead line, short circuits asymmetrical analysis, protection system, power factor correction, position control system, speed control system and servo system.

References:

1 S. L. Herman, The complete laboratory manual for electricity, Clifton Park, NY: Delmar, 2009. Call number: TK147 .H47 2009ca.
2 D. V. Richardson, Laboratory operations for rotating electric machinery and transformer technology Upper Saddle River, NJ: Prentice Hall, 1997. Call number: TK2189 .R523 1997 ca.
3 R. L. Boylestad, Electronic devices and circuit theory. Pearson 2006. Call number: TK7868.B69/2006.
4 N. S. Nise. Control Systems Engineering, 6th Edition. John Wiley, 2011. Call number: TJ213 .N57 2011.
5 M. Gopal. Control Systems: Principle and Design, 2nd Edition. Tata McGraw Hill, 2002. Call number: TJ213 .G66 2002.
6 Nowakowski, Andrzej. Electric power transformer engineering, 2015. Call number: TK2551 .E44 2015.

BEJ 30103 Electronic Communication Systems

Synopsis:
This course introduces the fundamentals in analog and digital communication systems. Comprises of analysis of signals and noise, generation of analog and digital modulation schemes, transmission lines, antenna and wave propagation as a part of a complete system in communication. Finally, the topic discussed relate with current application in communication systems.

References:

1 Wayne Tomasi, Electronic Communication Systems: Fundamental Through Advanced 5th Ed., Pearson Prentice Hall, 2004. Call number: TK5101 .T65 2004.
2 Jeffrey S. Beasley, Gary M. Miller, Modern Electronic Communication 9th Ed., Pearson Prentice Hall 2008. Call number: TK5101 .B42 2008.
3 Couch, L. W., Digital and Anolog Communication Systems, 7th Ed, Pearson Prentice-Hall, 2007. Call number: TK5101 .C68 2007.
4 Louis Frenzel, Communication Electronics, McGraw-Hill, 2001. Call number: TK7816 .F67 2001 N8.
5 Proakis, J. G.et al, Essential of Communication System Engineering, Pearson Prentice-Hall, 2005.
6 Simon Haykin, Communication System, 4th Ed, John Wiley and Sons, 2001.
7 Singh, R. P., Communication systems: analog and digital, McGraw-Hill, 2012.
8 Krouk, Evgenii, Modulation and coding techniques in wireless communications, John Wiley, 2011.

BEJ 31303 Microprocessor and Computer Organisation

Synopsis:
This course provides an introduction to microprocessor systems and computer organisation with a focus on modern microprocessor architecture. The course covers the principles of microprocessor design, system architecture, and the use of modern tools to implement and experiment with microprocessor-based systems. Students will gain experience with programming and interfacing peripherals using the learned processor system.

References:

1 Intel, "Intel University Program (Microprocessor and Computer Organization)", Intel FPGA documentation (2021) https://fpgacademy.org/courses.html"
2 David A. Patterson and John L. Hennessy, "Computer Organization and Design – The Hardware/Software Interface (ARM® Edition)", Elsevier (2017).
3 Joseph Yiu, "System-on-Chip Design with Arm Cortex-M Processors", ARM Education, (2020).
4 Muhammad Tahir, Kashif Javed, "ARM Microprocessor Systems Cortex-M Architecture, Programming, and Interfacing", CRC Press (2017)"
5 Intel, "DE1-SoC Computer System with ARM Cortex-A9", Intel FPGA documentation, (2021): https://ftp.intel.com/Public/Pub/fpgaup/pub/Intel_Material/18.1/Computer_Systems/DE1-SoC/DE1-SoC_Computer_ARM.pdf

BEJ 30603 Digital Signal Processing

Synopsis:
This course aims to introduce the main concepts of digital signal processing, review of discrete signal and system, characteristic and operation, discrete convolution, sampling and quantization, discrete Fourier transform, z-transform and the implementation of digital filters.

Pre-requisite: BEJ 20203 Signals and Systems

References:

1 Digital Signal Processing: A modern Introduction, Ashok Ambardar, International Student Edition, Thomson, 2007. Call Number: TK5102.5.A43 2007.
2 Digital Signal Processing: Principles, Algorithm and Applications, John G. Proakis, Dimitris G Manolakis, 4th Ed., Pearson Prentice Hall, 2007.
3 Analog and Digital Signal Processing, Ashok Ambardar, 2nd Ed, Thomson, 1999. Call Number: TK5102.9.A43 1999.
4 Digital signal processing with Matlab, Vinay K. Ingle, John G. Proakis, 3rd Ed., Cengage Learning, 2012. Call Number: TK5102.9.I53 2012.
5 Understanding digital signal processing, Richard G. Lyons, 3rd Ed, Prentice Hall, 2011. Call Number: TK5102.9.L96 2011

BEJ 30701 Engineering Practices

Synopsis:
The course is developed to give the required knowledge of:
1 Domestic electrical wiring and installation. It will develop the capability of carrying out electrical wiring activities up to a certain level of competency. The topics covered are the domestic wiring and installation.
2 Designing of electronic circuit's aspects, Proteus software will be used as it will help in making the schematic entry, signal simulation and printed circuit board layout. Soldering technique will be introduced to create a skill in prototype produce aspect.
3 PLC will be used to provide the programming knowledge for the controlling of the basic and advance automation system.

References:

1 J .Theodore Wildi. Electrical Machines, Drives, and Power Systems, 6th Edition, Pearson Education International, 2006. (Call Number TK2182 .W54 2006)
2 Dugan Roger C, McGranaghan M F, Santoso S and Beaty H Wayne. Electrical Power Systems Quality, 3rd Edition, McGraw-Hill, 2012. (Call Number TK1010 .E43 2012)
3 T. A. Short. Electric Power Distribution Equipment and Systems, Taylor & Francis Group, 2006. (Call Number TK3091 .S56 2006)
4 N. S. Nise. Control Systems Engineering, 6th Edition. John Wiley, 2011. Call number: TJ213 .N57 2011
5 R. C. Dorf and R. H. Bishop. Modern Control Systems, 11th Edition. Prentice Hall, 2008. Call number: TJ216 .D67 2008
6 Ruzairi Abdul Rahim, Asas pengawal logik boleh atur cara (PLC), Penerbit UTM, 2010. Call number: TJ223 .R89 2010
7 Kamel, Khaled. Programmable Logic Controllers : Industrial Control, McGraw-Hill, 2014 Call number: TJ223.P76 .K35 2014
8 Mike Judd and Keith Brindley, Soldering in Electronics Assembly, 1992, https://doi-org.ezproxy.uthm.edu.my/10.1016/C2013-0-01187-5
9 Kraig Mitzer, Complete PCB Design Using OrCAD and PCB Editor, 2019, 2nd Edition, https://doi-org.ezproxy.uthm.edu.my/10.1016/C2018-0-00854-3

BEJ 30801 Electronic Engineering Laboratory III

Synopsis:
This laboratory provides hand-on experience for the student to understand the material presented in the Electronic Communication System BEJ30103 and Electronic Circuit Analysis & Design BEJ30403.

References:

1 Martin, Mike W. (2010), Introduction to Engineering Ethics, McGraw Hill. Call number: TA157 .M37 2010, TA157 .M37 2010.
2 Tom Russ (2010), Sustainability and Design Ethics, CRC. Call number: TA157 .R87 2010, TA157 .R87 2010.
3 Bowen, W. Richard (2009), Engineering Ethics: Outline of an Aspirational Approach, Springer. Call number: TA157 .B68 2009, TA157 .B68 2009.
4 Charles E. Harris, Michael S. Pritchard, Michael J. Rabins (2009), Engineering ethics: Concepts and cases, Wadsworth Pub. Call number: TA157 .H37 2009, TA157 .H37 2009.
5 Adisa Azapagic, Slobodon Perdan (2011), Sustainable development in practice: case studies for engineers and scientists, 2nd Edition, Wiley. Call number: TA160 .S97 2011,TA160 .S97 2011.

BEE 32205 Industrial Training

Synopsis:
The course aims to provide an opportunity for students to undergo practical in working sector especially engineering field, technology and management as well as to enhance professional skills and interpersonal skills.

Pre-requisite: At least 60% of the total credits have been completed.

References:
Buku Log Latihan Industri UTHM (Bahagian A), Pejabat Penerbit, UTHM.

BEE 32603 Integrated Design Project

Synopsis:
This course introduces students with the principles of integrated electrical and electronic engineering design project based on a given theme. It involves teamwork, project management, engineering design and technical presentation in a driven environment. Each team is expected to address problem statement, survey, design, analysis, evaluation and revision of design towards engineering problem solution. The students have to ensure that the proposed project meets the need of end users with appropriate considerations for public health and safety, cultural, societal, economy and environmental.

Pre-requisite: Student has to complete minimum 70 credit hours

References:

1 Kosky, Philip Balmer, Robert Keat, William Wise, George. (2021). Exploring Engineering – An Introduction to Engineering and Design (5th Edition). Elsevier. Retrieved from https://app.knovel.com/hotlink/toc/id:kpEEAIED01/exploring-engineering/exploring-engineering
2 Kerzner, Harold. (2022). Project Management – A Systems Approach to Planning, Scheduling, and Controlling (13th Edition). John Wiley & Sons. Retrieved from https://app.knovel.com/hotlink/toc/id:kpPMASAP05/project-management-systems/project-management-systems
3 Project Management Institute. (2024). Standard for Program Management (5th Edition). Project Management Institute, Inc. (PMI). Retrieved from https://app.knovel.com/hotlink/toc/id:kpSPME0041/standard-program-management/standard-program-management
4 Safety and Health Guideline, Department of Occupational Safety and Health (DOSH). Retrieved September 9, 2024, from https://www.dosh.gov.my/index.php/legislation/guidelines
5 Jayakumar, V. Razak, Khairunisak Abdul. (2024). Engineering Systems, Equipment and Robotics. Trans Tech Publications. Retrieved from https://app.knovel.com/hotlink/toc/id:kpESER0003/engineering-systems-equipment/engineering-systems-equipment
6 Jain, Vishal Chatterjee, Jyotir Moy Kumar, Pradeep Kose, Utku. (2022). Healthcare Monitoring and Data Analysis Using IoT – Technologies and Applications. Institution of Engineering and Technology (The IET). Retrieved from https://app.knovel.com/hotlink/toc/id:kpHMDAUITK/healthcare-monitoring/healthcare-monitoring
7 Westcott, Sean Westcott, Jean Riescher. (2023). Basic Electronics - Theory and Practice (4th Edition). Mercury Learning and Information. Retrieved from https://app.knovel.com/hotlink/toc/id:kpBETP0001/basic-electronics-theory/basic-electronics-theory
8 K. Ghosh. Introduction to Measurements and Instrumentation. New Delhi: Prentice-Hall, 2007. Call number: TA165.G46 2007.

BEE 40602 Final Year Project I

Synopsis:
This course is the first part of an individual project during final year of study based on a topic selected from the subjects studied or a related engineering problem. Each student is expected to present his proposal and research in addition to a progress report during the first seminar of the final year project.

Pre-requisite: Student has to complete minimum 90 credit hours

References:
1 Guidelines for the Implementation of Final Year Project in the Faculty of Electrical and Electronics Engineering UTHM.
2 Guidelines for thesis writing.
3 A guide to technical report writing, The Institution of Engineering and Technology (IET).
4 Final year project, The Institution of Engineering and Technology (IET).

BEE 40704 Final Year Project II

Synopsis:
This course is the second part of an individual project during final year of study based on a topic selected from the subjects studied or a related engineering problem. Each student is expected to present result of his/her final year project.

Pre-requisite: BEE 40602 Final Year Project I

References:
1 Guidelines for the Implementation of Final Year Project in the Faculty of Electrical and Electronics Engineering UTHM.
2 Guidelines for thesis writing.
3 A guide to technical report writing, The Institution of Engineering and Technology (IET).
4 Final year project, The Institution of Engineering and Technology (IET).

Synopsis of Specialisation Courses
(Semiconductor and Integrated Circuit Design)

BEJ 23002 Programming Language for IC Design

Synopsis:
This course provides an in-depth introduction to essential programming and scripting languages for automating and supporting the Integrated Circuit (IC) design tool flow. Students will gain practical experience with Linux commands, Bash shell scripting, TCL scripting, and Python programming, which are critical for automating design processes and supporting IC design tool workflows.

References:

1 Sunil K. Singh, (2021), Linux Yourself Concept and Programming, Chapman and Hall/CRC.
2 Veena S. Chakravarthi, (2022), A Practical Approach to VLSI System on Chip (SoC) Design, Springer
3 Ashok P. Nadkarni, (2017), The TCL Programming Language: A Comprehensive Guide, CreateSpace Independent Publishing Platform
4 Eric Matthes, (2023), Python Crash Course: A Hands-On, Project-Based Introduction to Programming

BEJ 30403 Electronic Circuits Analysis and Design

Synopsis:
Fundamental concepts of analog electronics and the application of these concepts to the design and analysis of analog circuits. Among the topics covered are the fundamentals of operational amplifiers, linear and non-linear applications of operational amplifier, active filters, feedback, oscillators and timers, and regulated DC power supply. The focus is on the design and analysis of analog circuits. A simulation of a design using a computer simulation software will be used before circuit implementation is done.

References:

1 R.Boylestad, L. Nashelsky; Electronic Devices and Circuit Theory, 11th Ed.; Prentice Hall; 2013. Call number: TK7867 .B69 2013.
2 Donald A. Neamen; Microelectronics Circuit Analysis and Design, 4th Ed.; McGraw Hill, 2010. Call number: TK7867 .N434 2010.
3 Adel S. Sedra and Kenneth C. Smith; Microelectronics Circuits, 5th Ed.; Oxford Univ. Press, 2004. Call number: TK7867 .S32 2004.
4 Thomas L. Floyd; Electronic Devices, 8th Ed.; Prentice Hall, 2005. Call number: TK7870 .F564 2008.
5 Albert Paul Malvino; Electronic Principles, 7th Ed.; McGraw Hill, 2007. Call number: TK7816 .M34 2007.

BEJ 30503 Digital Design

Synopsis:
This course introduces students to digital logic design, progressing from basic combinational and sequential logic to advanced topic such as processor design. The course focuses on Register-Transfer Level (RTL) design using hardware description language HDL, with practical implementation on FPGA boards. Students will learn to design, verify, and test digital circuits, culminating in the development of a simple processor.

Pre-requisite: BEJ 10603 Digital Electronics

References:

1 Intel, "Intel University Program (Digital Logic)", Intel FPGA documentation (2021): https://fpgacademy.org/courses.html"

1 Stephen Brown and Z. Vrasenic, "Fundamental of Digital Logic with Verilog Design", McGraw-Hill Higher Education, (2014): TK7868.L6 .B76 2014

2 Sarah L. Harris, David Haris, "Digital Design and Computer Architecture: From Gates to Processors", Elsevier Science & Technology (2007): TK7868.D5H34 2007

3 Sarah L. Harris, David Haris, Digital Design and Computer Architecture: RISC-V Edition", Elsevier Science & Technology (2021)

4 Intel, "DE1-SoC Computer System with ARM* Cortex* A9", Intel FPGA documentation (2021): https://ftp.intel.com/Public/Pub/fpgaup/pub/Intel_Material/18.1/Computer_Systems/DE1-SoC/DE1-SoC_Computer_ARM.pdf

BEJ 33103 Fundamental of Semiconductor

Synopsis:

This course deals with the analysis and fundamentals of semiconductor physics involving the applications and devices. It starts with the energy bands and carrier concentration of semiconductor materials. It is followed by the carrier transport phenomena in the semiconductor. Next, p-n junction is introduced as the basic building block of semiconductor devices. The last chapters explain the basic semiconductor devices; MOSFET.

References:

1 D. A. Neamen (2006), An Introduction to Semiconductor Devices, McGraw-Hill. Call number: TK7871.85 .N42 2006.

2 S. M. Sze, Kwok K. Ng (2006), Physics of Semiconductor Devices, 3rdEd., John Wiley and Sons Inc. Call number: TK7871.85 .S98 2006.

3 Betty Lise Anderson and Richard L. Anderson (2005), Fundamentals of Semiconductor Devices, McGraw-Hill. Call number: TK7871.85 .A52 2005.

4 Safa O. Kasap (2006), Principles of Electronic Materials and Devices, 3rd Ed., McGraw-Hill. Call number: TK453 .K37 2006.

5 Robert F. Pierret (2002), Advanced Semiconductor Fundamentals, 2nd Ed., Prentice Hall. Call number: TK7871.85 .P53 2003

BEJ 40401 Electronic Engineering Laboratory IV

Synopsis:

This course is intended to introduce the practicum of microprocessor and computer organization which emphasis on software and hardware simulation. The students will learn the organization of a computer and microprocessor; write programming codes to control the operation and learn how to verify it using simulation software before implementing into the hardware.

References:

1 Intel, "Intel University Program (Microprocessor and Computer Organization)", Intel FPGA documentation (2021) https://fpgacademy.org/courses.html"

2 David A. Patterson and John L. Hennessy, "Computer Organization and Design - The Hardware/Software Interface (ARM® Edition)", Elsevier (2017).

3 Joseph Yiu, "System-on-Chip Design with Arm Cortex-M Processors", ARM Education, (2020).

4 Muhammad Tahir, Kashif Javed, "ARM Microprocessor Systems Cortex-M Architecture, Programming, and Interfacing", CRC Press (2017)"

5 Intel, "DE1-SoC Computer System with ARM Cortex-A9", Intel FPGA documentation, (2021): https://ftp.intel.com/Public/Pub/fpgaup/pub/Intel_Material/18.1/Computer_Systems/DE1-SoC/DE1-SoC_Computer_ARM.pdf

BEJ 43001 Microelectronic Engineering Laboratory

Synopsis:

This course is introduced to give students pratical experience in understanding the integrated circuit (IC) fabrication process. This includes VLSI and MEMS design, microfabrication and characterization.

References:

1 Senturia, S. D. (2001), Microsystem design. London: Kluwer Academic Published, Call number: TK7875 .S46 2001.
2 Franssila S. (2010), Introduction to Microfabrication, Willey. Call number: TK7875 .P72 2010.
3 Madou, M. J. (2002), Fundamentals of Microfabrication, The Science of Minituarization, 2nd Ed.; Boca Raton: CRC Press, 2002. Call number: TK7836 .M32 2002.
4 Travis N. Blalock and Richard C. Jaegaer, (2004) Microelectronic Circuit Design, McGraw-Hill. Call number: TK7874 .J34 2011.
5 System-level modeling of MEMS / edited by Tamara Bechtold, Gabriele Schrag, Lihong Feng (2013). Wiley-VCH. Call number: TK7875.S97 2013
6 Albert Malvino, David J. Bates, Patrick E. Hoppe, Electronic Principles, 9th Ed., McGraw Hill, 2021. ISBN 978-1-260-57056-4
7 S. M. Sze, Yiming Li, Kwok K. Ng, Physics of Semiconductor Devices, 4th. Ed., John Wiley & Sons, Inc., 2021. ISBN-13: 978-1119429111
8 Ben G. Streetman, Sanjay Kumar Banerjee, Solid State Electronic Devices, 7th Ed.,Peason Education, 2015, ISBN-13: 978-1292060552
9 Krishnan, Kannan M., Principles of Materials Characterization and Metrology, Oxford University Press, 2021, https://app-knovel-com.ezproxy.uthm.edu.my/kn/resources/kpPMCM001H/toc?b-q=semiconductor%20and%20failure%20analysis&cid=kpPMCM001H&include_synonyms=no
10 Tilli, Markku; Paulasto-Kröckel, Mervi; Petzold, Matthias; Theuss, Horst; Motooka, Teruaki; Lindroos, Veikko, Handbook of Silicon Based MEMS Materials and Technologies, 3rd Edition, Elsevier, 2020, https://app-knovel-com.ezproxy.uthm.edu.my/kn/resources/kpHSBMEM12/toc?b-q=semiconductor%20and%20failure%20analysis&cid=kpHSBMEM12&include_synonyms=no

BEJ 43103 VLSI System

Synopsis:

The course will introduce the principles and practices of Very-Large-Scale Integration (VLSI) technology in complementary metal oxide semiconductor (CMOS) technology focusing on the design and implementation of integrated circuits (ICs). Its covers the fundamental of CMOS logic circuits, layout, optimization techniques as well as the crucial parameters to be considered in any VLSI system design. Students will be introduced to Electronic Design Automation (EDA) design tools to help in designing VLSI circuit.

References:

1 N. Weste and D. Harris (2011). CMOS VLSI Design: A Circuits and Systems Perspective, 4th Ed., Addison Wesley. Call number TK7874 .W474 2011
2 J. M. Rabaey, A. Chandrakasan and B. Nikolic (2003). Digital Integrated Circuits: A Design Perspective, 2nd Edition, Prentice Hall. Call number TK7874.65 .R32 2003
3 R. J. Baker, H. W. Li and D. E. Boyce (2005). CMOS Circuit Design, Layout and Simulation, 2nd Edition, IEEE Press. . Call number TK 7871.99.M44.B34 2005
4 M.-B. Lin (2012). Introduction to VLSI Systems: A Logic, Circuit, and System Perspective, CRC Press. Call numberTK7874.75 .L56 2012
5 M. Michael Vai (2001). VLSI Design, CRC Press. Call Number: TK7874.75 .V34 2001.
6 S. M. Kang and Y. Leblebici (2002). CMOS Digital Integrated Circuits: Analysis & Design. 3rd Ed., McGraw-Hill. Call Number: TK7871.99.M44 .K36 2003.
7 J. P. Uyemura (2002). Introduction to VLSI Circuits and Systems, John Wiley. Call Number: TK7874 .U942 2002.
8 https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=1135765.

BEJ 43203 Micro Fabrication

Synopsis:
This course provides students the comprehensive knowledges on Artificial intelligent techniques applied to control system design. Topics include Neural Networks, Fuzzy Logic and Bayesian Networks (Kalman Filter and Particle Filter) and how to design such controller using Engineering Software.

References:

1 Ian Goodfellow, Yoshua Bengio and Asron Courville, Deep Learning, MIT Press, 2016. (http://www.deeplearningbook.org)
2 Francois Chollet, Deep Learning with Python, Manning, 2018.
3 T. J.Ross, Fuzzy Logic with Engineering Application 2nd Edition, John Wiley & Sons Ltd, 2004. Call number: TA331 .R67 2004
4 Satish Kumar, Neural Networks, A Classroom Approach, McGraw Hill, 2004. Call number: QA76.87 .K85 2004
5 Leonid Reznik, Fuzzy Controllers, Newnes-Butterworth-Heinemann, 1997. Call number: TJ213 .R48 1997
6 Callan, R., The Essence of Neural Networks, Prentice Hall, 1999. Call number: QA76.87 .C34 1999.
7 Simon Haykin, Neural Networks: A Comprehensive Foundation, Prentice Hall, 1999. Call number: QA76.87. H39 1999.

BEJ 43903 Analog IC Design

Synopsis:
This course provides a comprehensive introduction to the principles and techniques of analog integrated circuit (IC) design. Students will explore the fundamentals of MOS transistors, design and analysis of single-stage and differential amplifiers, and operational amplifiers. Other topics include the fundamental analog circuit topologies, concepts and essential ICs layout design techniques. The course also delves into operational amplifiers, highlighting their configurations, applications, and key parameters.

References:

1 Behzad Razavi (2001). Design of Analog CMOS Integrated Design, 2nd. Ed., McGraw Hill. Call number TK7874.654 .R39 2001 N4
2 R. Jacob Baker (2005). CMOS: Circuit Design, Layout, and Simulation, 4th Ed,. Wiley-IEEE Press. Call number TK7871.99.M44 .B34 2005
3 Philip E. Allen and Douglas R. Holberg (2011). CMOS Analog Circuit Design, 3rd. Ed., Oxford University Press. Call number TK7874 .A44 2002
4 Behzad Razavi (2015). Microelectronics, 2nd. Ed., Wiley. Call number TK7874 .R39 2015
5 Tony Chan Carusone, David A. Johns and Kenneth W. Martin (2013). Analog Integrated Circuit Design. 2nd. Ed., Wiley. Call number TK7874 .C44 2013]
6 Alan Hasting (2006). The Art of Analog Layout, 2nd. Ed., Prentice Hall. Call number TK7874 .H37 2001 N2
7 Çilingiroğlu, Uğur. 2019. " Small-Signal Modeling and Circuit Analysis." Chap. 3.7 in Analog Integrated Circuit Design by Simulation: Techniques, Tools, and Methods. 1st ed. New York: McGraw-Hill Education. https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781260441451/toc-chapter/chapter3/section/section33

BEJ 43113 Embedded System with SoC

Synopsis:
This course provides an in-depth understanding of embedded systems within System on Chip (SoC) architectures, focusing on programming and I/O methodologies using Embedded Linux on an embedded processor in the SoC-FPGA. Students will learn the theoretical and practical concepts in SoC by exploring the I/O in embedded systems, device drivers, hardware-software integration, real-time systems and latest advanced topics in embedded systems.

References:

1 Intel, "Intel University Program (Embedded System)", Intel FPGA documentation (2021): https://fpgacademy.org/courses.html
2 Ross K. Snider, "Advanced Digital System Design using SoC FPGAs: An Integrated Hardware/Software Approach", Springer International Publishing (2023).
3 Joseph Yiu, "System-on-Chip Design with ARM Cortex-M Processors", ARM Education, (2020).
4 Mounir Maaref, "Architecting and Building High-Speed SoCs: Design, develop, and debug complex FPGA-based systems-on-chip", Packt Publishing (2022)
5 Intel, "DE1-SoC Computer System with ARM Cortex-A9", Intel FPGA documentation (2021): https://ftp.intel.com/Public/Pub/fpgaup/pub/Intel_Material/18.1/Computer_Systems/DE1-SoC/DE1-SoC_Computer_ARM.pdf

BEJ 43122 Advanced Physical Design

Synopsis:
This course covers the concepts and techniques involved in the physical design of Integrated Circuits (ICs). Topics include the physical implementation of RTL code, automatic place and route, clock tree synthesis, routing with signal integrity, formal verification, parasitic extraction, ECO flow, UPF for low power designs, static timing analysis, and layout verification. Students also will be introduced to the industry-standard tools and methodologies to prepare for careers in IC design.

References:

1 Yang, Jun, Peng Cao, Weiwei Shan, Longning Qi, and Xinning Liu.(2024) Digital Integrated Circuit Design. Singapore: Springer Nature Singapore, doi:10.1007/978-981-99-2836-1_36.
2 Gubbi, K.I., B.S. Latibari, M.A. Chowdhury, A. Jalilzadeh, E.Y. Hamedani, S. Rafatirad, A. Sasan, H. Homayoun, and S. Salehi.(2024) “Optimized and Automated Secure IC Design Flow: A Defense-in-Depth Approach.” IEEE Transactions on Circuits and Systems I: Regular Papers, Circuits and Systems I: Regular Papers, IEEE Transactions on, IEEE Trans. Circuits Syst. I 71, no. 5 : 2031–44. doi:10.1109/TCSI.2024.3364160.
3 Pothiraj, S., Kadambarajan, J.P. and Kadarkarai, P. (2021) ‘Floor Planning of 3D IC Design Using Hybrid Multi-verse Optimizer’, Wireless Personal Communications: An International Journal, 118(4), pp. 3007–3023. doi:10.1007/s11277-021-08166-z.
4 Clein, Dan. (2024) CMOS IC Layout: Concepts, Methodologies and Tools. Newnes. Accessed . https://search.ebscohost.com/login.aspx?direct=true&db=cat08806a&AN=ptta.81541&site=eds-live&scope=site.#TK7871.99 .M44 .C53 2000

BEJ 43503 IC Packaging

Synopsis:
This course deals with the IC packaging and its testability. It covers on IC packaging that includes the types of packaging, microassembly processing, metallization techniques, the chip-package interconnection and several advanced packaging.

References:

1 R. R. Tummala (2001), Fundamentals of Microsystems Packaging, McGraw-Hill, New York. Call number: TK7870.15.F86 2001.
2 Glen R.Blackwell (2000), The Electronic Packaging Handbook, CRC Press LLC. Call number: TK7870.15 .E4332000 N1.
3 Ed. M. Datta, T. Osaka & J. W. Schultze (2005), Microelectronic Packaging, RC Press LLC. Call number: TK7870.15 .M52 2005.
4 Charles A. Happer (2005), Electronic Packaging and Inter connection Handbook, McGraw-Hill, New York. Call number: TK7870.15 .H37 2005.
5 T. Moore, R. McKenna (2010), Characterization of Integrated Circuit Packaging Materials, Momentum, New York. Call number: TK7870.15 .C42 2010.

Elective Course I
(Semiconductor and Integrated Circuit Design)

BEJ 43303 Advanced Semiconductor Devices

Synopsis:
This course starts with the analysis of bipolar transistor and variations of FET in term of their structure and operation. It is followed by analysis of multi-gate transistors in terms of their unique features. Next, analysis of several microwave diodes are also covered in term of their basic structure and operation. Finally, analysis of power devices and its application is presented.

Pre-requisite: BEJ 33103 Fundamental of Semiconductor

References:

1 D. A. Neamen (2006), An Introduction to Semiconductor Devices, McGraw-Hill. Call number: TK7871.85 .N42 2006.
2 S. M. Sze, Kwok K. Ng (2006), Physics of Semiconductor Devices, 3rd Ed., John Wiley and Sons Inc. Call number:TK7871.85 .S98 2006.
3 Charles Coleman (2008), Modern Physics for Semiconductor Science, McGraw-Hill. Call number: TK7871.85 .C64 2008.
4 Bhattacharya, D. K. (2013), Solid State Electronic Devices, Oxford University Press. Call number: TK7871.85 .B45 2013.
5 Sergey G. Lebedev (2016), Solid State Devices and Electronics, Intelliz Press. Call number: TK7871.85.S64 2016.

BEJ 43403 MEMS Technology

Synopsis:
This course introduces students to the multi-disciplinary and exciting field of MicroElectroMechanical Systems (MEMS). It teaches the introduction to MEMS, MEMS material and mechanical properties, methods of fabrication, design approach, applications of microsensors & microactuators as well as microfluidics. The course emphasizes teamwork and active learning. Students work together on using simulation and fabrication facilities to build simple MEMS structures.
References:

1 Pelesko, J. A. & Bernstein, D. H. (2003), Modeling MEMS and NEMS. Boca Raton: CRC Press, Call number TK7875 .P44 2003.
2 Senturia, S. D. (2001), Microsystem design. London: Kluwer Academic Published, Call number TK7875 .S46 2001.
3 Korvink, J.G. & Oliver, P. (edt.) (2006), MEMS: A Practical Guide to Design, Analysis and Applications. USA: Springer, Call number TK7875 .M48 2006.
4 Gardner, J. W., Varadan, V. K. & Awadelkarim, O. O. (2001), Microsensors, MEMS, and Smart Devices. England: John Wiley & Son Ltd., 2001, Call number TK7875 .G37 2001 N1.
5 Madou, M. J. (2002), Fundamentals of Microfabrication, The Science of Minituarization, 2nd Ed.; Boca Raton: CRC Press, Call number TK7836 .M32 2002.

BEJ 43603 Material Characterization

Synopsis:
This course introduces the surface and material characterisation techniques related to bonding surface. Surface analysis is use of microscopic associated to the optical, chemical and physical probes that give information about the surface region of a sample. Most of the techniques used probe surface utilized the electrical measurements setup, emission and absorption spectroscopy analysis and as well as the

nature electromagnetic radiation. The basic concept of reliability concern and failure analysis of a semiconductor sample is also introduced that deals with the sample preparation, electrostatic discharge mechanism and electromigration.

References:

1 Dieter K. Schroder; Semiconductor Material and Device Characterization, 3 rd Ed.; John Wiley; 2006. Call number: QC61.S33 2006.
2 W. R. Runyan and T. J. Shaffner; Semiconductor Measurements and Instrumentation, 2 nd Ed.; McGraw Hill, 1998.Call number: QC611.24 .R86 1998.
3 Tor A. Fjeldly, Trond Ytterdal and Micheal Shur; Introduction to Device Modeling and Circuit Simulation; John Wiley and Sons, 1998. Call number: TK7871.85 .F63 1998.
4 Richard S. Muller, Theodore I. Kamins and Mansun Chan; Device Electronics for Integrated Circuits, 3rd Ed.; John Wiley and Sons, 2003. Call number: TK871.85 .M84 2003.

BEJ 43703 Nanoelectronic Devices

Synopsis:

This course introduces the fundamental of nanotechnology. It covers the nanoscale processing, the fabrication of nanostructures for advanced device applications and to understand the techniques for the characterisation of device structures made on the nanoscale. The last part covers about the introduction to advanced devices and as a part of practical aspect, students will also be required to conduct a project on device modelling and simulation using any related simulation tools.

References:

1 Dieter K. Schroder (2006), Semiconductor Material and Device Characterization, 3rd Ed.; John Wiley, New York. Call number: QC611 .S33 2006.
2 W. R. Runyan and T.J. Shaffner (1997), Semiconductor Measurements and Instrumentation, 2nd Ed.; McGraw-Hill. Call number: QC611.24. R86 1998.
3 Tor A. Fjeldly, Trond Ytterdal, and Michael Shur (1998), Introduction to Device Modeling and Circuit Simulation; John Wiley and Sons, New York. Call number: TK7871.85 .F63 1998.
4 Gary E. Mcguire (1989), Characterization of Semiconductor Materials, Principles and Methods, Vol.1; Noyes Publication. Call Number: QC611.8.C64 .C42 1989.
5 Richard S. Muller, Theodore I. Kamins, and Mansun Chan (2003), Device Electronics for Integrated Circuits, 3rd ed.; John Wiley and Sons. Call number: TK7871.85 .M84 2003.

BEJ 43803 Reliability and Testability in IC Device

Synopsis:

This course deals with the IC to understand the concept and principles of reliability and testing modes mechanisms, with emphasis on the applied techniques.

References:

1 Patrick O'Connor (2002). Practical Reliability Engineering, Wiley.
2 Ebeling, C. E. (1997). Reliability and Maintainability Engineering, McGraw Hill.
3 Lawrence C. Wagner, (1999). Failure Analysis of Integrated Circuits: Tools and Techniques.Kluwer Academic Publishers.
4 Perry L. Martin (1999). Electronic Failure Analysis Handbook.: McGraw Hill.
5 E. Ajith Amerasekera and Farid N. Najm (1997). Failure Mechanisms in Semiconductor Devices. 2nd Ed.: John Wiley & Sons.
6 Friedrich Beck (1998). Integrated Circuit Failure Analysis: A Guide to Preparation Techniques: John Wiley & Son.
7 M. Bushnell & V.D. Agrawal. Essentials of Electronic Testing for Digital, Memory & Mixed-Signal VLSI Circuits. 2000.

BEJ 43133 Design for Test

Synopsis:
This course provides an in-depth understanding of Design for Testability (DFT) principles and techniques. Students will learn how to design and implement testable circuits, focusing on various DFT strategies and methodologies. The course covers scan insertion, Automatic Test Pattern Generation (ATPG), and testing techniques for advanced semiconductor technologies.

Pre-requisite: BEJ 33103 Fundamental of Semiconductor

References:

1 Zilch, Lucas B., Marcelo S. Lubaszewski, and Tiago R. Balen.(2022) "Automatic Tool for Test Set Generation and DfT Assessment in Analog Circuits." Analog Integrated Circuits and Signal Processing: An International Journal 112, no. 2: 277–87. doi:10.1007/s10470-022-02039-6.
2 Bhunia Swarup, & Tehranipoor Mark. (2019). 3.7.1 Design-for-Testability. In Hardware Security - A Hands-On Learning Approach. Elsevier.
3 Hsieh, S.-A., Wang, Y.-H., Shen, T.-Y., Huang, K.-Y., Pai, C.-C., Chen, T.-C., & Li, J. C.-M. (2019). DR-Scan: Dual-Rail Asynchronous Scan DfT and ATPG. IEEE Transactions on Computer-Aided Design of Integrated Circuits & Systems, 38(1), 136–148. https://doi.org/10.1109/TCAD.2018.2801226
4 Bushnell, M. L., & Agrawal, V. D. (2000.). Essentials of electronic testing for digital, memory, and mixed-signal VLSI circuits. Kluwer Academic. TK7874.75 .B87 2000 n.1

BEJ 43143 Photonic Devices

Synopsis:
This course is about the fundamental of photonic devices and consists of six chapters. Students will learn on semiconductor photonic materials and properties, light emitting diodes, photodetectors and photovoltaic devices. The course will concentrate on the properties of photonic material, design structure, characterization, fabrication process and application of photonic devices.

References:

1 Neamen, Donald A. (2012), Semiconductor physics and devices: basic principles, McGraw-Hill. Call number: QC611.N42 2012.
2 Ueda, Osamu (2012), Reliability and materials issues of III-V and II-VI semiconductor optical and electrical devices and materials II: symposium held April 9-13, 2012, San Francisco, California, U.S.A., Materials Research Society. Call number: TK7871.85 .R44 2012.
3 Kissell, Thomas E. (2012), Introduction to solar principles, Prentice Hall. Call number: TK8322 .K57 2012.
4 Khan, M. Nisa, (2014), Understanding LED illumination, CRC Press. Call number: TK7871.89.L53 .K52 2014.
5 Hamaguchi, Chihiro, (2010), Basic semiconductor physics, Springer. Call number: QC611 .H35 2010.
6 Kirk, Alexander P. (2015), Solar photovoltaic cells: photons to electricity, Academic Press, Oxford, Call Number: TK2960 .K57 2015.

Synopsis of Specialisation Courses
(Elective Course II – Master Integration)

MEE 10103 Advanced Engineering Mathematics

Synopsis:
Root finding of nonlinear system, solution of the linear systems, multivariate approximation, optimization and forecasting in engineering.

References:

1 Tay, K. G, Kek, S. L & Abdul Kahar, R. (2013). Numerical Methods with Excel. Penerbit UTHM, Batu Pahat.
2 Tay, K.G. & Abdul Kahar, R. (2011). Advanced Engineering Mathematics. 3rd Edition. Penerbit UTHM, Batu Pahat.
3 Tay, K. G, Kek, S. L & Abdul Kahar, R. (2011). Numerical Methods with Casio ES PLUS Calcculator. Penerbit UTHM, Batu Pahat.
4 Chapra, S. C. and Canale, R. P. (2009). Numerical Methods for Engineers. Sixth edition. Mc Graw Hill, New York.
5 Gen, M, Cheng, R.(2000). Genetic Algorithms and Engineering Optimization.Japan: John Wiley & Son, Inc.
6 Clerc, M. (2006). Particle Swarm Optimization. USA: ISTE Ltd.

MEE 10203 Programmable Electronics

Synopsis:
The course introduces the digital hardware design concepts and the modelling using HDL to synthesize of digital circuits using Programmable Logic Technology. Students will expose to the state of the art of Programmable Logic Technology. Students also learn the development, synthesis and modelling of Combinational Circuits, Sequential Circuit, Finite State Machine, RTL design and the testing approaches on the circuits.

References:

1 Roth Jr, Charles H. (2016). Digital systems design using Verilog, Boston: Cengage Learning. [TK7888.3.R67 2016]
2 Wilson, Peter. (2016). Design recipes for FPGAs : using Verilog and VHDL /Peter Wilson, Newnes, Elsevier. [TK7895.G36 .W57 2016]
3 Botros, Nazeih.(2015). HDL with digital design: VHDL and Verilog, Mercury Learning and Information. [TK7885.7 .B67 2015]
4 Mehler, Ronald (2015). Digital integrated circuit design using Verilog and system Verilog, Elsevier. [TK7874.65 .M43 2015]
5 Brown, Stephen. (2014). Fundamentals of digital logic with Verilog design, McGraw-Hill Higher Education. [TK7868.L6 .B76 2014]

MEE 10303 Advanced Digital Processing

Synopsis:
This subject is to introduce the advance concepts in digital signal processing, to demonstrate its applications and implementation constraints and introducing the real-time DSP using MATLAB tools

References:

1 Analog and Digital Signal Processing, Ashok Ambardar, 2nd Ed, brooks/Cole, 1999
2 Discrete-Time Signal Processing, Alan V. Oppenheim, Ronald W. Schafer, 2nd Ed, Prentice Hall, 1999.

3 Random Signals for Engineers Using MATLAB and Mathcad, Richard C. Jaffe, A Springer, 2000.
4 Digital Signal Processing: Principles, Algorithm and Applications, John G. Proakis, Dimitris G. Manolakis, 3rd Ed, Prentice Hall, 1996.
5 Digital Signal Processing and Statistical Classification, George J. Miao, Mark A. Clements, Artech Housing Publishers, 2002.
6 Digital Signal Processing with Examples in MATLAB®, Second Edition (Electrical Engineering & Applied Signal Processing Series) 2nd Edition, Samuel D. Stearns, Donald R. Hush, CRC Press, 2011.

MEE 10403 Computational Intelligence

Synopsis:
Neural Network Fundamentals; Mathematical Foundations; Supervised Learning NN Model; Backpropagation Algorithm; Unsupervised Learning Model NN; Competitive Networks; Grosberg Networks; Classical set and Fuzzy

References:
1 Analog and Digital Signal Processing, Ashok Ambardar, 2nd Ed, brooks/Cole, 1999.
2 Discrete-Time Signal Processing, Alan V. Oppenheim, Ronald W. Schafer, 2nd Ed, Prentice Hall, 1999.
3 Random Signals for Engineers Using MATLAB and Mathcad, Richard C. Jaffe, A Springer, 2000.
4 Digital Signal Processing: Principles, Algorithm and Applications, John G. Proakis, Dimitris G. Manolakis, 3rd Ed, Prentice Hall, 1996.
5 Digital Signal Processing and Statistical Classification, George J. Miao, Mark A. Clements, Artech Housing Publishers, 2002.
6 Digital Signal Processing with Examples in MATLAB®, Second Edition (Electrical Engineering & Applied Signal Processing Series) 2nd Edition, Samuel D. Stearns, Donald R. Hush, CRC Press, 2011.

MEE 10603 Advanced Power Electronics

Synopsis:
This subject will discuss a review of electrical fundamentals of power electronics devices concepts of PWM modulation techniques apply in power semiconductor switches. The student also will be discussed in details about Diode Rectifiers, Thyristor-Based Rectifiers, DC to DC Converters, DC to AC Converters, AC to AC Converters in three phase system. As at the end, utility Applications of Power Electronics in alternative energy application.

References:
1 Mohan Ned, Undeland Tore M and Robbin William P, Power Electronics: Converters, Applications and Design, 3rd Edition, John Wiley, 2003. [TK7881.15 .M63 2003]
2 Rashid M.H, Power Electronics, Circuits, Devices and Applications, 3rd Edition, Prentice-Hall, 2004. [TK7881.15 .M5 2004]
3 Rashid M.H, SPICE for power electronics and electric power, 2nd Edition, Bota Raton, Taylor and Francis, 2006 [TK7881.15 .M83 2006]
4 Qing Chang Zhong, Control of power inverters in renewable energy and smart grid integration, John Willey, 2013 TK7872.C8 .Z46 2013
5 Rashid M.H, Alternative Energy in Power Electronics, Amsterdam : Butterworth-Heinemann, 2015, TK7881.15 .A47 2015
6 Chanson, H. (2004). The Hydraulics of Open Channel Flow: An Introduction. Amsterdam: Elsevier. [TC175 .C42 2004]

Synopsis of Specialisation Courses
(Elective Course III – General)

BEE 41103 HCIA Routing and Switching

Synopsis:
Huawei (HCIA) Routing & Switching: network fundamentals, Ethernet, various protocols such as those used in routing, and Huawei's own VRP operating system that covers all essential aspects of HCIA certification. Presenting routing and switching basics in depth, it is a valuable resource for information and communications technology (ICT) practitioners, university students and network technologist.

References:

1 Huawei Technologies Co. Ltd, HCNA Networking Study Guide, Springer, 2016
2 W.Stallings, High Speed Networking, TCP/IP and ATM Design Principles, Prentice Hall, 1998
3 W. Stallings, Data and Computer Communications, 5e, Prentice Hall, 1997
4 B. Sklar, Digital Communications: Fundamentals and Applications, Prentice Hall, 1988
5 Nalin K.Sharda, Multimedia Information Networking, Prentice Hall, 1999

BEE 41203 HCIA Cloud Computing

Synopsis:
uawei HCIA-Cloud Computing course is aimed at introducing the basic of cloud computing, as well as how to use virtualization technology to realize the basic characteristics of cloud computing. This course covers the introduction of Cloud Computing and virtualization, storage, network in Cloud Computing, virtualization features and development trend of Cloud Computing, which are valuable resources for information and communications technology (ICT) practitioners, university students and network technologist.

References:

1 Huawei Technologies Co. Ltd, HCNA Networking Study Guide, Springer, 2016
2 Jiongjiong Gu, Cloud Computing Architecture: Technologies and Practice, 2021.
3 Lei Zhang and Le Chen, Cloud Data Center Network Architectures and Technologies, 2021.
4 Dan C. Marinescu, Cloud Computing: Theory and Practice, Call Number : QA76.585 .M37 2013.
5 Jamsa, Kris A, Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security and More, Call Number : QA76.585 .J35 2013.

BEE 41303 HCIA Artificial Intelligence

Synopsis:
Huawei HCIA-AI course is aimed to introduce the basic of artificial intelligence (AI), as well as understand the AI development history. This course covers the AI, Machine Learning and Deep Learning overview, mainstream development framework for AI, Huawei AI development framework, Huawei AI Computing Platform, Huawei AI platform for smart devices and Huawei Cloud Enterprise Intelligence application platform. This course contents are valuable resources for those who are interested in learning how to build and manage AI for commercial needs, ICT practitioners, university students and network technologist.

References:

1 Huawei Technologies Co. Ltd, HCNA Networking Study Guide, Springer, 2016
2 Xiaoyao Liang, Ascend AI Processor Architecture and Programming: Principles and Applications of CANN, 2020
3 Zhiyuan Chen, Bing Liu, Lifelong Machine Learning: Second Edition, 2018
4 Flach, Peter A, Machine learning: The Art and Science of Algorithms That Make Sense of Data, Call Number: Q325.5. F52 2012.
5 Brent M. Gordon, Artificial Intelligence: Approaches, Tools and Applications, Call Number: Q335.5. A78 2011.

BEE 41403 Electric Vehicles

Synopsis:

This course introduces the fundamental concepts, principles, components and control of electric vehicles. This course goes deeper into the various aspects of the electric drive-train, such as the technologies, configuration, types of electric machines, energy storage devices, and electric vehicle control. Each topic is developed in logical progression with the latest information.

References:

1 IOT fundamentals: networking technologies. protocols, and use cases for the internet of things, Indianapolis, IN: Cisco Press, 2017.
2 Sebastian Thrun; Wolfram Burgard; Dieter Fox: Probabilistic robotics, Cambridge, Massachusetts: The MIT Press, 2006.
3 Electric vehicle technology explained / James Larminie, John Lowry.Call number: TL220.L35, 2003.
4 Introduction to modern power electronics / Andrzej M. Trzynadlowski. Call number: TK7881.15. T79 2016.
5 Power electronics and electric drives for traction applications/ edited by Gonzalo Abad. Call number: TJ1095.P68, 2017.
6 Modeling power electronics and interfacing energy conversion systems / M.Godoy Simoes and Felix A. Farret. Call Number: TK7881.15. S55, 2017.

BEE 41503 Photovoltaic Systems

Synopsis:

The course has been designed to introduce the technology of solar photovoltaic engineering and grid-connected photovoltaic (GCPV) design. The main topic of this course consists of basic solar engineering, photovoltaic technology, GCPV system design, performance evaluation, operation and maintainance. The GCPV design software and related national and international standards are also discussed in this course.

References:

1 Seda Malaysia Grid-Connected Photovoltaic Systems Design, Sustainable Energy Development Authority Malaysia, 2016.
2 Seda Malaysia Off-Connected Photovoltaic Systems Design, Sustainable Energy Development Authority Malaysia, 2014.
3 Ali Keyhani, Design of Smart Power Grid Renewable Energy System, Wiley, ISBN 9781118978771, 2017.

BEE 41703 Business Start-up and Technopreneurship

Synopsis:
This course introduces students to the fundamentals of technopreneurship, guiding them from idea generation to startup launch. Covering design thinking, business structures, financial planning, intellectual property, and digital marketing, it emphasizes hands-on learning through workshops, case studies, simulations, and field visits. The course culminates in a Demo Day where students pitch and showcase their Minimum Viable Products (MVPs), preparing them to navigate Malaysia's startup ecosystem with innovation and entrepreneurial confidence.

References:

1 DeGarmo, E. Paul (1997). Engineering Economy, Prentice-Hall, TA177.4. E63. 1997.
2 Sullivan, William G. (2009). Engineering Economy, Pearsonl, TA177.4 .S94 2009.
3 Kamariah Ismail, Noraini Abu Talib, Mohd. Hassan et al. (2009). Technology Entrepreneurship, Prentice-Hall. Call number HD45 .T44 2009.
4 UiTM Entrepreneurship Study Group (2004). Fundamentals of Entrepreneurship, revised edition, Prentice-Hall. Call number HB615 .F86 2004.
5 Bruce R. Barringer, R. Duane Ireland (2010). Entrepreneurship: successfully launching new ventures, 3rd Edition. Prentice-Hall. Call number HB615 .B37 2010.
6 Charles E. Bamford, Garry D. Bruton (2011). Entrepreneurship: a small business approach. New York: McGraw-Hill. Call number HD62.5 .B35 2011.
7 Schaper M., Volery, T, Weber, P., Lewix, K., (2011). Entrepreneurship and small business; 3rd Asia-Pacific Edition. John Wiley & Son. Call number HD2341 .E57 2011.
8 Jamal Nassar, (2018) Technopreneurship Financing & Startups Ecosystem: How Malaysia Is Creating Another Success Story; Call number HD62.5 .J35 2018
9 Rambat Lupiyoadi, Kurniawan (2020) Technopreneurship, Penerbit Salemba Empat 2020.
10 Shelters David (2013) Start-Up Guide for the Technopreneur, John Wiley, Call number: HD62.37 .S43
11 Scaffidi, Federica; Micelli, Ezio; Nash, Matt (2025) The role of the social entrepreneur for sustainable heritage-led urban regeneration, Cities, Vol 158, March 2025. https://doi.org/10.1016/j.cities.2024.105670
12 Ascencio, Christine; Benmamoun, Mamoun; Katz, Jerome; Brinkmeier, Alex (2024) Enriching the Typology of Social Entrepreneurs: The Transnational Dimension. Administrative Sciences, Vol. 14, Issue 12, p335-350, https://doi.org/10.3390/admsci14120335
13 Shahnoel Noeh, Amirul; Rozaidah Pg Hj Idris, Pg; Anshari, Muhammad (2022) Decision Model in the Development of Technopreneurship and the Adoption of IR4.0 Technologies, International Conference on Decision Aid Sciences and Applications (DASA). https://doi.org/10.1109/DASA54658.2022.9765016

BEJ 44173 Electrical Machines

Synopsis:
The principles of electrical engineering are fundamental to understanding the operations and characteristics of various AC and DC circuits and machines. This course provides a comprehensive study of electrical systems, including transformers, AC and DC machines, and generators. Through this subject, students will gain the skills and knowledge necessary to analyze and solve real-world electrical engineering problems across different industries, preparing them for challenges in the modern electrical and industrial environment.

References:

1 Chapman Stephen J., Electric Machinery Fundamentals, 5th Edition; McGraw-Hill, 2005. Call number: TK2000 .C42 2012
2 Chitra A., Sanjeevikumar Padmanaban, Jens Bo Holm-Nielsen, and S. Himavathi. (2020). Artificial Intelligent Techniques for Electric and Hybrid Electric Vehicles. ProQuest Ebook Central. https://ebookcentral.proquest.com/lib/uthm-ebooks/reader.action?docID=6261123&query=electric+motor
3 Sahdev, S.K., 2017. Electrical machines. Cambridge University Press.
4 Fernandes, J.F., Bhagubai, P.P. and Branco, P.J., 2022. Recent Developments in Electrical Machine Design for the Electrification of Industrial and Transportation Systems. Energies, 15(17), p.6390.

EFF 40103 Introduction to Big data

Synopsis:

Big Data is a term used to describe a collection of data that is huge in size and yet growing exponentially with time. In short, such data is so large and complex that none of the traditional data management tools are able to store it or process it efficiently. This course provides knowledge on how to handle and manage big data.

References:

1 Chu, Wesley W Data Mining and Knowledge discovery for big data: methodologies, challenge and opportunities. Berlin, Heidelberg: Springer 2014. Call Number: QA76.9.D379 2014
2 Reiss, Rolf D. Statistical of extreme values: with applications to insurance, finance, hydrology and other fields. Basel: Birkhauser Call Number: QA273.6.R44 2007.
3 Little, Roderick J.A. Statistical analysis with missing data. Hoboken, NJ: John Wiley, 2002 Call Number: QA276. L57 2002
4 Liu, Shen Computation and statistical methods for analysing big data with applications. London: Academic Press, 2015 Call Number: QA76.9.C66 2015
5 Voss, Jochen An introduction to statistical computing: a simulation-based approach, Chichester, West Sussex: Wiley 2014 Call Number: QA276.4. V67 2014

EIF 40103 Machine Learning

Synopsis:

Data visualisation is the graphical representation of information using visual elements like charts, graphs, maps, dashboard and etc. Data visualisation tools such as Tableau and Microsoft Power BI provides an accessible way to see and understand trends, outliers, forecast and patterns in data.

References:

1 Lee Meng Wei. (2019). Python Machine Learning. Wiley.
2 Mohri Mehryar, Afshin Rostamizadeh, and Ameet Talwalkar. (2018). Foundations of Machine Learning. The MIT Press.
3 Andreas C. Müller & Sarah Guido. (2016) Introduction to Machine Learning with Python: A Guide for Data Scientists. O'Reilly Media.
4 Shalev-Shwartz S., Ben-David S. (2014). Understanding Machine Learning: From Theory to Algorithms. Cambridge University Press.
5 Christopher M. Bishop. (2011). Pattern Recognition and Machine Learning. Springer

EWF 40103 Data Science and Applications

Synopsis:
In this course, student will learn how to leverage on data to unlock new economic value for your business, as well as apply useful data science concepts to every aspect of your daily life from personal finances, to reading, lifestyle habits, and work decisions. This course will combine a good balance of theoretical knowledge and practical application where students will learn the processes of gathering, cleaning and handling data and learning big data concepts by using case study references to reinforce learning.

References:

1 Kelleher, J. D. & Tierney, B. (2018). Data Science. The MIT Press, USA. ISBN: 9780262535434.
2 Baumer, R. B. Kaplan, D., & Horton, N. (2017). Modern Data Science with R. Chapman and Hall/CRC Press: Florida, USA. ISBN 9781498724487.
3 Igual, L. & Seui, S. (2017). Introduction to Data Science: A Python Approach to Concepts, Techniques and Applications. Springer Nature, Cham, Switzerland. ISBN: 9783319500164.
4 EMC Education Services. (2015). Data Science & Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data. John Wiley & Sons, Inc., ISBN: 9781118876138.
5 Grus, J. (2015). Data Science from Scratch: First Principles with Python. O'Reilly Media Inc., Sebastopol, Canada. ISBN: 9781491901427.
6 O'Neil, C. & Schutt, R. (2013). Doing Data Science. O'Reilly Media, Inc., Sebastopol, Canada. ISBN: 9781449358655.
7 Huang, M.L. 2014. Innovative Approaches of Data Visualization and Visual Analytics. Hershey: Information Science Reference. (QA76.9 .I52 2014)
8 Information Dashboard Design: Displaying Data for At-a-Glance Monitoring Stephen Few, O'Reilly Media (2013)

EWF 40203 Data Visualisation

Synopsis:
Data visualisation is the graphical representation of information using visual elements like charts, graphs, maps, dashboard and etc. Data visualisation tools such as Tableau and Microsoft Power BI provide an accessible way to see and understand trends, outliers, forecast and patterns in data.

References:

1 Dzemyda, G. 2013. Multidimensional data visualization: methods and applications. New York: Springer. (TK7881.16 . D93 2013).
2 Yau, N. (2011). Visualize This: The FlowingData Guide to Design, Visualization, and Statistics. Indianapolis: O'Reilly.
3 Few, S. (2012). Show me the numbers: Designing tables and graphs to enlighten. Burlingame, CA: Analytics Press.
4 Huang, M.L. 2014. Innovative Approaches of Data Visualization and Visual Analytics. Hershey: Information Science Reference. (QA76.9 .I52 2014).
5 Information Dashboard Design: Displaying Data for At-a-Glance Monitoring Stephen Few, O'Reilly Media (2013).

UQU40103 Professional at Work

Synopsis:
The Professional at Work course is designed to improve the ability of students to develop their technical skills in professionalism, social responsibility, and environmental sustainability. Nurturing and empowering the student with these skills could enhance the student's professionalism prior to entering the workspace. The philosophy of the course is ongoing, systematic, and aimed toward a fulfilling work life, which is part of their overall plan for personal development. This course includes an introduction to professional practice, ethics, legal, innovation and infrastructure, social responsibility, and professional environment. Also, this course was developed by referring to Sustainable Development Goals (SDG) and Politic, Economy, Social, Technology, Environment, and Legal (PESTEL) guidelines. Particularly, students will propose a suitable community service project that deals with local/community issues that lead to professional practices.

References:

1. Lydia E. Anderson & Sandra B. Bolt (2016). Professionalism: skills for workplace success. Pearson, c2013 ISBN 9780132624664
2. Department of Economic and Social Affairs, United Nation (2019). Handbook for th preparation of valuntary national reviews
3. Purohit, S. S. (2008). Green technology: an approach for sustainable environment. ISBN: 9788177543438, [S494.5.S86 .P87 2008]
4. Russ, Tom (2010). Sustainability and design ethics. ISBN: 9781439808542 [TA157. R87 2010]
5. Yoe, Charles (2012). Principles of risk analysis: decision making under uncertainty. ISBN: 9781439857496 [T57.95 .Y63 2012]

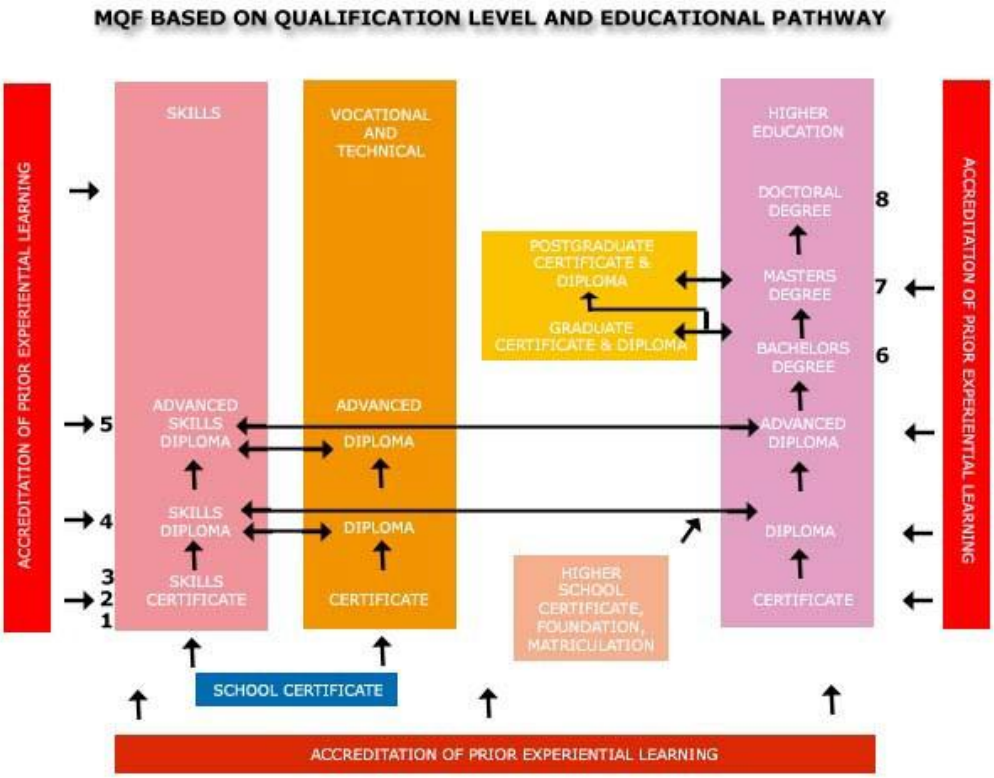
Career and Further Education Prospect

Graduates of the Bachelor of Electronic Engineering (Semiconductor and Integrated Circuit Design) with Honours are equipped with strong technical knowledge and practical skills in electronic engineering, embedded systems, analog and digital IC design, semiconductor device physics, VLSI systems, fabrication processes, IC packaging and testing, and industry-standard design tools. The program prepares students to meet the challenges and demand of semiconductor ecosystem by equipping them with strong technical expertise, hands-on design experience, problem-solving skills, and industry-relevant knowledge aligned with both local and global semiconductor advancements.

Upon graduation, students will have excellent opportunities to pursue professional careers in a wide range of electronic and semiconductor industries which includes advanced packaging, testing, and design service. With strong technical competencies and hands-on laboratory experience, graduates may pursue professional roles as IC Design Engineer (Analog / Digital / Mixed-signal), Physical Design Engineer, Semiconductor Test Engineer, ASIC/SoC Design Engineer, IC Layout Engineer, Verification Engineer, Design for Testability (DFT) Engineer, Application Engineer (Semiconductor), Field Application Engineer (FAE), Yield Engineer, Failure Analysis Engineer, Reliability Engineer, Production/Process Control Engineer, Post-Silicon Validation Engineer, Development Engineer, and R&D Engineers.

Nevertheless, the room for continuing studies is always available. The programme also provides a solid foundation for further education, enabling graduates to continue postgraduate studies at the Master or PhD level in specialised areas such as IC Design, embedded system, failure analysis, materials synthesis, characterization, advanced fabrication, nanotechnology, and electronic engineering. This ensures graduates to drive innovation, remain competitive and adaptable in supporting high-value semiconductor manufacturing, and strengthen the global competitiveness of the semiconductor industry.

Further Education Pathway



MALAYSIAN QUALIFICATIONS FRAMEWORK: QUALIFICATIONS AND LEVELS

MQF Levels	Sectors			Lifelong Learning
	Skills	Vocational and Technical	Higher Education	
8			Doctoral Degree	Accreditation of Prior Experiential Learning (APEL)
7			Masters Degree	
			Postgraduate Certificate & Diploma	
6			Bachelors Degree	
			Graduate Certificate & Diploma	
5	Advanced Diploma	Advanced Diploma	Advanced Diploma	
4	Diploma	Diploma	Diploma	
3	Skills Certificate 3	Vocational and Technical Certificate	Certificate	
2	Skills Certificate 2			
1	Skills Certificate 1			

Disclaimer:

This is a revised Faculty of Electrical and Electronic Engineering Proforma Bachelor of Electronic Engineering with Honours as of 15th September 2025 FKEE



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