UTHM
Universiti Tun Hussein Onn Malaysia

ACADEMIC PROFORMA

2026/2027



BACHELOR OF

ELECTRONIC ENGINEERING WITH HONOURS (BEJ)



FACULTY OF
ELECTRICAL & ELECTRONIC ENGINEERING
UNIVERSITI TUN HUSSEIN ONN MALAYSIA
86400, PARIT RAJA,
BATU PAHAT,
JOHOR.



https://cad.uthm.edu.my
+607 453 7302
+607 453 6334(faks)
cad@uthm.edu.my

Information contained in this proforma is true at the time of printing and the University has the right to make any amendment according to needs.

All rights reserved. No part of this proforma may be reproduced in any form or by any means, electronic, photocopying, recording, visual, or otherwise, without prior written permission of the Vice Chancellor of Universiti Tun Hussein Onn Malaysia.

Centre for Academic Development and Excellence
Universiti Tun Hussein Onn Malaysia
August 2026

Contents

Foreword by the Vice Chancellor 4
Foreword by the Deputy Vice Chancellor (Academic and International) 5
Foreword by the Dean, Faculty of Electrical and Electronic Engineering 6
Vision of the University 7
Mission of the University 7
Education Philosophy of University 7
Logo of the University 7
Chancellor and Pro-Chancellors 8
Board of Directors of University 11
Members of Senate 12
Faculty of Electrical and Electronic Engineering 15
- Faculty Background 15

Quality Objectives 16
Organizational Chart 17
External Advisors 18
Faculty Staff Directory 19
Programme Information 36
- Programme Overview 36
- Programme Educational Objectives (PEO) 38
- Programme Learning Outcomes (PLO) 38
- Study Plan 39
- Synopsis of the University Courses 48
- Synopsis of the Core Mathematics Courses 51
- Synopsis of the Core Faculty Courses 53
- Synopsis of the Core Programme Courses 56
- Synopsis of the Specialisation Courses (Communication Engineering) 64
- Synopsis of the Specialisation Courses (Computer Engineering) 71
- Synopsis of the Specialisation Courses (Medical Electronic Engineering) 79
- Synopsis of the Specialisation Courses (Elective Course II – Master Courses) 86
- Synopsis of the Specialisation Courses (Elective Course III – General) 88

Career and Further Education Prospect 92
Further Education Pathway 93

Foreword by The Vice Chancellor



Assalammualaikum Warahmatullahi Wabarakatuh and greetings.
I would like to extend my warmest congratulations and a heartfelt welcome to all new students of Universiti Tun Hussein Onn Malaysia (UTHM).

Your decision to join UTHM marks the beginning of an important and meaningful journey. We are honoured by the trust you have placed in our university, and we are committed to supporting you throughout your studies.

At UTHM, education is not only about gaining knowledge and earning a qualification. We want you to develop the skills, values and confidence needed to face the challenges of a rapidly changing world. Our academic programmes are continuously improved to provide quality learning experiences, nurturing critical thinking, and prepare you to contribute to society and the nation.

UTHM also places strong emphasis on research and innovation. Through research, we seek to develop practical and sustainable solutions to economic, social and environmental challenges. As students, you will have opportunities to learn, explore new ideas and participate in activities that connect your knowledge with real-world needs.

Beyond the classroom, UTHM encourages students to engage with the community and work with different stakeholders. These experiences will help you develop leadership, teamwork, communication and problem-solving skills while allowing you to make a positive contribution to society.

We also believe that good governance, integrity, responsibility and ethical values are essential in building a strong and trusted university. These values guide the way we teach, conduct research, serve the community and manage the university.

Our vision is to build a sustainable and resilient future through quality education, impactful research, meaningful community engagement and responsible governance. We hope that your time at UTHM will not only help you achieve academic success but also shape you into responsible, capable and future-ready graduates.

Once again, I warmly welcome all of you to the UTHM family. Make the most of every opportunity, learn from your experiences, build meaningful relationships and enjoy your journey with us.
I wish you every success in your studies and in all your future endeavours.

Welcome to UTHM, and I wish you a rewarding and memorable academic journey.

Thank you.

"*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 Greetings,

Congratulations and a warm welcome to all new students who have chosen Universiti Tun Hussein Onn Malaysia (UTHM) as their destination for higher education in pursuit of academic excellence and personal development. UTHM remains fully committed to providing a holistic, high-quality, and industry-relevant educational experience that meets current global challenges and future demands.

I would also like to express my sincere appreciation to the Centre for Academic Development and TVET (CAD), the faculties, and all parties involved in the publication of this programme proforma book. This publication serves not only as an important reference for students and stakeholders, but also reflects the university's commitment towards transparency, quality assurance, and effective academic programme delivery.

In line with the aspirations of the Ministry of Higher Education Malaysia and the university's direction towards becoming a *Global Technopreneur University 2030 (GTU2030)*, UTHM continues to strengthen its position as a global technical university in sustainable technology and transportation. TVET-based education, flexible learning approaches, digitalisation initiatives, and strong industry collaboration remain the key pillars in producing competent, professional, and globally competitive graduates.

Alhamdulillah, UTHM has achieved numerous accomplishments and recognitions at both national and international levels. These include recognition in the QS World University Rankings, Times Higher Education (THE) Rankings, UI GreenMetric, and various ratings related to sustainability, research, and TVET education. UTHM has also been recognised as a UNESCO TVET Chair, a UNESCO-UNEVOC International Centre for TVET, and one of Malaysia's leading TVET institutions in transportation technology. These achievements reflect the university's continuous commitment to advancing technical education and impactful innovation.

Currently, UTHM offers more than 114 academic programmes across diploma, bachelor's degree, master's degree, and doctoral levels, all accredited by the Malaysian Qualifications Agency (MQA) and relevant professional bodies. Supported by qualified academic and professional staff, the university continues to strengthen its educational ecosystem through centres of excellence, teaching factories, industrial laboratories, research centres, and strategic international collaborations.

Beyond academic excellence, UTHM also provides a conducive and comprehensive campus environment to support students' holistic development. Modern facilities, sports complexes, libraries, residential colleges, and inclusive learning environments contribute significantly towards nurturing balanced and well-rounded graduates.

In conclusion, I sincerely hope that this programme proforma book will serve as a valuable guide for students in planning their academic journey. May all initiatives and efforts undertaken by UTHM continue to produce high-quality graduates who will contribute meaningfully to national development and global well-being.

Thank you.

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. Shereen Sabrina binti Abd Shukor
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

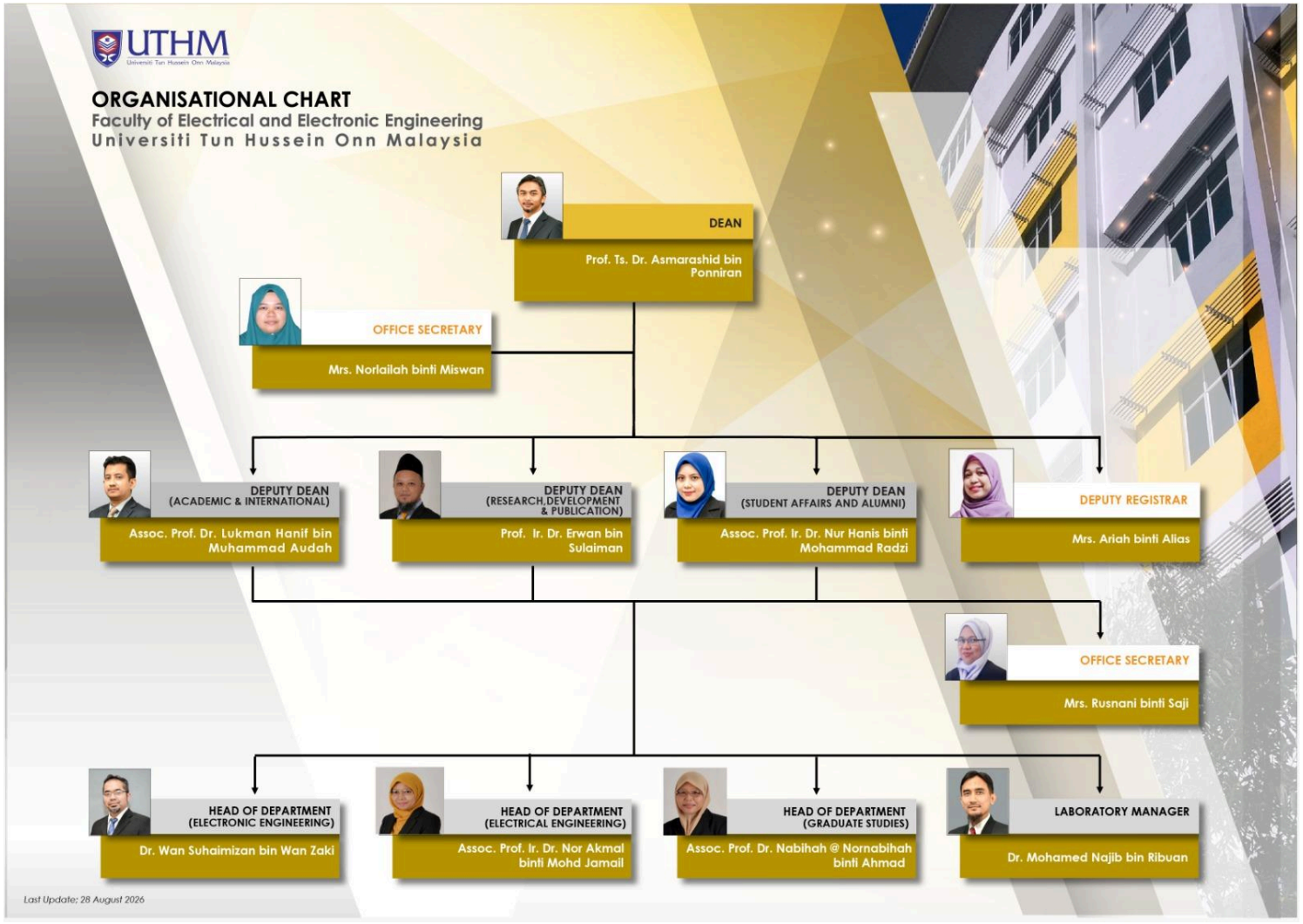
Universiti Tun Hussein Onn Malaysia is committed to offer high quality academic programmes grounded in Engineering, Science and Technology to meet the needs of its stakeholders through an outstanding quality management system in line with the ISO 9001: 2015.

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. Teoh Giap Seng
SkyeChip Bhd.

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

En. Muhammad Nurazmi Bin Abas
Pahang Aerospace City Development Berhad

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)
BSc (Electrical and Electronic) (UTM)
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)

Professor Ir. Dr. Mohammad Faiz Liew bin Abdullah
PhD (Electrical Engineering) (University of Warwick)
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)

Associate Professor Ir. Dr. Dirman Hanafi bin Burhannuddin
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)

Associate Professor Dr. Shamsul Aizam bin Zulkifli
PhD (Electrical Engineering) (Loughborough University)
MEng (Electrical Power) (UPM)
BEng (Electrical & Electronics) (UPM)

Associate Professor Dr. Wahyu Mulyo Utomo
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 WITH HONOURS (BEJ)

About the Programme

This program is designed by taking into account the latest development in electronic engineering field to prepare the students with the capabilities of solving complex engineering problems in electronic engineering. It covers five electronic engineering disciplines for the prospective students to choose which are Computer Engineering, Medical Electronic Engineering, Mechatronic Engineering, Communication Engineering and Microelectronic Engineering. The program structure contains core electronic engineering courses, elective courses and laboratory (experiments and engineering practice) sessions. Graduates of this program are trained to be competent in the field of electronic engineering to fulfill the industrial demand at the national and international level. In addition, they are equipped with the necessary generic skills which are to be applied holistically in their professional engineering practice. On top of that, the graduates are nurtured to perform their work ethically and faithfully according to the needs of 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 with Honours

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

Year 2 (Semester 3 & 4)
Creativity and Innovation, Multivariable Calculus, Control Systems, Signals and Systems, Multimedia Technology and Applications, Electronic Engineering Laboratory I, Engineering Economics and Entrepreneurship, Numerical Methods, Electromagnetic Fields and Waves, Power Systems, Electrical Machines, Engineering Statistics and Electronic Engineering Laboratory II.

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

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

Year 4 (Semester 7 & 8)
Final Year Project I, Electronic Specialization III, Electronic Specialization IV, Elective Course I, Electronic Engineering Laboratory IV, Final Year Project II, Electronic Specialization V, Elective Course II and Electronic Specialization Laboratory V.

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
Computer & Microcomputer Engineer, Network & Computer System Admin., Network System & Data Communication Analyst, Computer Software Engineer, Computer System Analyst, Software Applications Developer, Internet of Things System Developer, Software Security Engineer, Software Engineer, Failure Analysis Engineer, IC Design Engineer, Process Engineer, Wafer FAB Engineer, Wire bond Engineer, Die Attach Engineer, Product Development Engineer, Electronics Design Engineer, Data Scientist, Manufacturing Engineer, Process & Equipment Engineer, Network Communication Engineer, Radio Communication Engineer, Microwave Communication Planner, Broadcast Communication Engineer, Satellite Communication Engineer, Cellular Communication Planner, Antenna Designer, Process Engineer (Optical Coating), Optical Core Transport Engineer, Medical Equipment Maintenance Servicer, Healthcare Consultant on Equipment Standards, Medical Device Designer and Medical Instrumentation 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 with Honours Programme (BEJ)
Dr. Wan Suhaimizan bin Wan Zaki
☎ +607 – 456 4506
✉ 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*1XX01	Co-Curriculum I	1
	UHB1XX02	*Foreign Language (local)	2
	UHB24202	**Bahasa Melayu Komunikasi 4 (international)	
	BEE22503	Engineering Economic and Entrepreneurship	3
	BEE32402	Numerical Methods	2
	BEJ20503	Control Systems	3
	BEJ20203	Signals and Systems	3
	BEJ20701	Electronic Engineering Laboratory I	1
	BEJ2xxx2	Specialisation	2
	Total		**16**

Sem.	Course Code	Course Name	Credit
4	UQ*1XX01	Co-Curriculum II	1
	UHB23102	English for Technical Communication	2
	BEE22402	Creativity and Innovation	2
	BEE32502	Engineering Statistics	2
	BEJ20303	Electromagnetic Fields and Waves	3
	BEJ20603	Power Systems	3
	BEJ20801	Electronic Engineering Laboratory II	1
	BEJ2xxx3	Specialisation	3
	Total		**18**

YEAR 3

Sem.	Course Code	Course Name	Credit
5	BEE32302	Engineers and Society	2
	BEJ30203	Microprocessor and Computer Organisation	3
	BEJxxxx2	Specialisation	2
	BEJxxxx3	Specialisation	3
	BEJ30801	Electronic Engineering Laboratory III	1
	BEJ30701	Engineering Practices	1
	BEJ30203	Electronic Circuits Analysis and Design	3
	BEJ30103	Electronic Communication Systems	3
	Total		**17**

Sem.	Course Code	Course Name	Credit
6	UHB33102	English for Professional Communication	2
	BEE30103	Engineering Management	3
	BEE32603	Integrated Design Project	3
	BEJ30603	Digital Signal Processing	3
	BEJxxxx3	Specialisation	3
	BEJxxxx1	Specialisation	1
	BEJxxxx1	Specialisation Laboratory	1
	Total		**16**

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
	BEJ4xxx3	Specialisation	3
	BEJ4xxx3	Specialisation	3
	XXXxxxx3	Elective Course I/II	3
	XXXxxxx3	Elective Course I/II	3
	Total		**14**

Sem.	Course Code	Course Name	Credit
8	BEE40704	Final Year Project II	4
	BEJ4xxx3	Specialisation	3
	XXXxxxx3	Elective Course I/II/III	3
	BEJ4xxx3	Specialisation	3
	BEJ4xxx1	Specialisation Laboratory	1
	Total		**14**

ELECTIVE COURSES – Communication Engineering Specialisation

Compulsory Courses

Course Code	Course Name	Credit
BEJ20902	Object-Oriented Programming	2
BEJ30903	AIOT System Engineering	3
BEJ41803	RF & Microwave Engineering	3
BEJ40401	Electronic Engineering Laboratory IV	1
BEJ30701	Engineering Practices	1
BEJ31103	Electromagnetic Wave Propagation	3
BEJ31202	Data Communication Network	2
BEJ41103	Digital Communication	3
BEJ41203	Wireless and Mobile Communication	3
BEJ41303	Optical Communication	3
BEJ41001	Communication Engineering Laboratory	1
BEJ41603	Antenna Theory and Applications	3

Elective Course I (Choose one)

Course Code	Course Name	Credit
BEJ41503	Wireless Sensor and Mobile Ad-Hoc Network	3
BEJ41703	Electromagnetic Compatibility	3
BEJ41403	Satellite Communication and Navigation	3
BEJ41903	Fundamental of 5G Communication	3

ELECTIVE COURSES – Computer Engineering Specialisation

Compulsory Courses

Course Code	Course Name	Credit
BEJ20902	Object-Oriented Programming	2
BEJ30903	AIOT System Engineering	3
BEJ30503	Digital Design	3
BEJ40401	Electronic Engineering Laboratory IV	1
BEJ30701	Engineering Practices	1
BEJ32103	Data Structures and Algorithms	3
BEJ32202	Operating Systems	2
BEJ42103	Computer Networks	3
BEJ42203	Embedded Systems Design	3
BEJ42303	Software Engineering	3
BEJ42001	Computer Engineering Laboratory	1
BEJ42113	Database System	3

Elective Course I (Choose one)

Course Code	Course Name	Credit
BEJ42503	Advanced Microcontroller	3
BEJ42603	VLSI System Design	3
BEJ42703	Computer Security	3
BEJ42803	Artificial Intelligence	3
BEJ42903	Image Processing	3
BEJ42403	Computer System Engineering	3

ELECTIVE COURSES – Medical Electronics Engineering Specialisation

Compulsory Courses

Course Code	Course Name	Credit
BEJ20902	Object-Oriented Programming	2
BEJ30903	AIOT System Engineering	3
BEJ45703	Biomedical Engineering and Applications	3
BEJ40401	Electronic Engineering Laboratory IV	1
BEJ30701	Engineering Practices	1
BEJ35102	Human Physiology	2
BEJ35203	Medical Equipment Management and Safety	3
BEJ45103	Medical Imaging	3
BEJ45203	Principle of Physiological Devices	3
BEJ45303	Medical Instrumentation	3
BEJ45001	Medical Electronics Engineering Laboratory	1
BEJ45403	Telemedicine System And Applications	3

Elective Course I (Choose one)

Course Code	Course Name	Credit
BEJ45503	Biomedical Optics	3
BEJ45603	Biomaterial	3
BEJ45803	Rehabilitation System Engineering	3
BEJ45903	BioMEMS and Medical Microdevices	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
BEJ43903	Analog IC Design	3
EWF40203	Data Visualisation	3
EIF40103	Machine Learning	3
BEJ44173	Electrical Machines	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 2009[a]].
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	*Aspira 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, 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

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, students 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 fundamental knowledge in analog electronics. 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 amplifiers. 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 are 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 systems, 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 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 Electromagnetics Fields and Waves

Synopsis:
This course is to introduce the fundamentals 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 problems. 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 followed with chapter 4 which describes the time domain analysis of control systems. Chapter 5 and chapter 6 treat 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 with an understanding of electrical power systems. The course is divided into three major parts: fundamentals 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, the 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 in 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 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. Consists 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 relates with current applications 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 Analog 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 30203 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 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 amplifiers, 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 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, Algorithms 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 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 work in the 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 projects 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 statements, survey, design, analysis, evaluation and revision of design towards engineering problem solutions. The students have to ensure that the proposed project meets the needs 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 the 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 the final year of study based on a topic selected from the subjects studied or a related engineering problem. Each student is expected to present the 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
(Communication Engineering)

BEJ 20902 Object-Oriented Programming

Synopsis:
This course will provide students with object-oriented programming concepts, knowledge and practice. These include the objects, classes, pointers, inheritance, polymorphism, encapsulation and abstraction. The students will also learn about advanced features and software development for electronic engineering applications.

References:

1 Malhotra, D., and N. Malhotra. C++ Programming Fundamentals, Mercury Learning & Information, 2023. ProQuest Ebook Central, https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=30302590.
2 Hardin, Therese, et al. Concepts and Semantics of Programming Languages 2 : Modular and Object-Oriented Constructs with OCaml, Python, C++, Ada and Java, John Wiley & Sons, Incorporated, 2021. ProQuest Ebook Central, https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=6690677.
3 Goran Svenk. (2003) Object-oriented programming : using C++ for engineering and technology / Australia : Delmar/Thomson Learning, Call number: QA76.64 .S93 2003
4 Steven F. Lott, & Dusty Phillips. (2021). Python Object-Oriented Programming : Build robust and maintainable object-oriented Python applications and libraries. Packt Publishing.
5 Parker, James R. (2021). Python – An Introduction to Programming (2nd Edition). Mercury Learning and Information. Retrieved from https://app.knovel.com/hotlink/toc/id:kpPAIPE002/python-an-introduction

BEE 40401 Electronics Engineering Laboratory IV

Synopsis:
This course is intended to introduce the practical of microprocessor and computer organization with 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 it 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 30903 AIOT System Engineering

Synopsis:
Artificial intelligence (AI) and Internet of Things (IoT) systems are two essential components in the future's modern digital electronic system. The combination of the systems integrates AI algorithm, IoT device node circuit and cloud computing technology. In this course students will be exposed to these technologies where they need to understand how to design, develop and analyze these systems using either simulation tools or hardware.

References:

1 John Soldatos. 2016. Building Blocks for IoT Analytics Internet-of-Things Analytics. River Publishers Series in Signal, Image and Speech Processing Ser. Aalborg: River Publishers. https://search-ebscohost-com.ezproxy.uthm.edu.my/login.aspx?direct=true&db=nlebk&AN=1800554&site=ehost-live&scope=site.

2 Rute C. Sofia, and John Soldatos. 2023. Shaping the Future of IoT with Edge Intelligence : How Edge Computing Enables the Next Generation of IoT Applications. River Publishers Series in Communications and Networking. Gistrup: River Publishers. https://search-ebscohost-com.ezproxy.uthm.edu.my/login.aspx?direct=true&db=nlebk&AN=3729113&site=ehost-live&scope=site.

3 Ovidiu Vermesan, and Peter Friess. 2016. Digitising the Industry Internet of Things Connecting the Physical, Digital and VirtualWorlds. River Publishers Series in Communications. Gistrup, Denmark: River Publishers. https://search-ebscohost-com.ezproxy.uthm.edu.my/login.aspx?direct=true&db=nlebk&AN=1800544&site=ehost-live&scope=site.

4 Marcus Handte, Pedro José Marrón, Gregor Schiele, and Matoses Manuel Serrano. 2019. Adaptive Middleware for the Internet of Things : The GAMBAS Approach. River Publishers Series in Communications. Gistrup, Denmark: River Publishers. https://search-ebscohost-com.ezproxy.uthm.edu.my/login.aspx?direct=true&db=nlebk&AN=2249738&site=ehost-live&scope=site.

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 techniques will be introduced to create a skill in the prototype product aspect.

3 PLC will be used to provide the programming knowledge for the controlling of the basic and advanced 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 41803 RF and Microwave Engineering

Synopsis:

The content of the course covers the aspects of RF and microwave engineering such as microwave network analysis, and design techniques for RF and microwave devices.

Pre-requisite: BEJ 31103 Electromagnetic Wave and Propagation

References:

1 David M. Pozar, Microwave Engineering, 3rd Ed., Wiley 2005. Call number: TK7876.P69 2005.
2 R. Ludwig and P. Bretchko, RF Circuit Design, (Theory and Applications), Prentice Hall, NJ, 2000. Call number: TK6553.L83 2000.
3 Annapurna Das and Sisir K Das, Microwave Engineering, Tata McGraw-Hill, New Delhi, 2000. Call number: TK7876.D37 2009.
4 Samuel Y. Liao, Microwave Devices & Circuits, 3rd Ed., Prentice Hall, NJ, 1997. Call number: TK7876.L48 1997.
5 Randy Bancroft, Microstrip and Printed Antenna Design, Scitech, 2006. Call number: TK7871.67.M5.B36 2006.

BEJ 31103 Electromagnetic Wave Propagation

Synopsis:

This course aims to provide comprehensive understanding on applied electromagnetic topics such as on transmission lines, waveguides, antennas, and radio waves propagation.

Pre-requisite: BEJ 20303 Electromagnetic Fields and Waves

References:

1 Matthew N.O.Sadiku, Elements of Electromagnetics, 4th Ed., Oxford University Press, 2007. Call number: QC760.S324 2007.
2 Fawwaz T. Ulaby, Fundamentals of Applied Electromagnetics, 5th Ed., Prentice Hall, 2007. Call number: QC760.U42 2010.
3 D.C. Green, Radio Communication, 2nd Ed.; London, Longman; 2000. Call number: TK6550.G73 2000 N1
4 W. Tomasi, Electronic Communication Systems Fundamentals Through Advance, 5th Ed., Prentice Hall, 2004. Call number: TK5101.T65 2004.
5 Constantine A. Balanis, Antenna theory: analysis and design,John Wiley, 2005. Call number: TK7871.6.B34 2005.

BEJ 31202 Data Communication Network

Synopsis:

This course is to introduce and understand data communication systems, open system architecture, OSI and TCP/IP protocol, error detection and correction, data link protocol, LAN, WAN, network protocol and transport protocol.

References:

1 William Stallings, Data and Computer Communications, 10th Ed., Pearson, 2014. Call no.: TK5105 .S73 2014.
2 Behrouz A. Forouzan, Data Communications and Networking, 5th Ed., McGraw-Hill, 2012. Call no.: TK5105 .F67 2012.
3 Alan Dennis, Fundamentals of Business Data Communications, 11th Ed., Wiley, 2012. Call no.: TK5105 .D46 2012.
4 Achyut S. Godbole, Data Communications and Networks, 2nd Ed., Tata Mc-Graw Hill, 2011. Call no.: TK5105 .G62 2011.
5 Russ White, Computer Networking Problems and Solutions: An Innovative Approach to Building Resilient, Modern Networks, Pearson, 2018. Call no.: TK5105.5 .W47 2018.

BEJ 41103 Digital Communication

Synopsis:

In this subject, students will enhance their knowledge in communication. Topics on digital transmission such as noise and bit error rate, and communication link analysis are emphasised in depth. Various types of channel coding such as waveform coding, convolutional coding, structured sequence, block coding will be investigated. Trade off between coding techniques and modulation is investigated next. Synchronization between transmitter and receiver, multiplexing and multiple access techniques and finally the spread spectrum system will be deeply examined.

References:

1 Skalar, Digital Communications – Fundamentals and Applications, 2nd Ed., Prentice Hall, 2001. Call Number TK 5103.7.555.2001.
2 L. W. Couch, Digital and Analog Communication Systems, 7th Ed., Pearson, 2007. Call Number: TK5101.C68 2007.
3 S. Haykin, M. Moher, Communication Systems, 5th Ed., John Wiley, 2010. Call Number: TK5101.H374 2010.
4 J. G. Proakis, M. Salehi, Digital Communications, 5th Ed., McGraw-Hill, 2008. Call Number: TK5103.7.P76 2008.
5 R. E. Ziemer, R. L. Peterson, Introduction to Digital Communications, 2nd Ed., Prentice Hall, 2001. Call Number: TK5103.7.Z53 2001.

BEJ 41203 Wireless and Mobile Communication

Synopsis:

This course aims to provide a comprehensive introduction to mobile cellular communication systems in terms of the history and its advancement, concept of cellular, understanding of spectrum efficiency in mobile terrestrial cellular radio systems, modulation techniques and multiple access techniques.

References:

1 T.S. Rappaport, Wireless Communication: Principles and Practice, 2nd Ed., Prentice Hall, 2002.
2 Hsiao-Hwa Chen, Next Generation Wireless Systems and Networks, Willey, 2006.
3 Dharma Prakash Agrawal, Introduction to Wireless and Mobile Systems, 2nd Ed., Thomson, 2006.
4 H Hamuda, Cellular Mobile Radio System, John Wiley, 1997.
5 Y Akaiwa, Introduction to Digital Mobile Communications, John Wiley, 1997.
6 J Tisal, GSM Cellular Radio, John Wiley, 1997. 7. R.C.V. Macario, Cellular radio, 2nd Ed., McGraw Hill 1997.
7 W.C.Y. Lee, Mobile Cellular Telecommunication – Analog and digital systems, 2nd Ed., MacGraw-Hill, 1995.

BEJ 41303 Optical Communication

Synopsis:

The course aims to provide a comprehensive introduction of the fiber optic communication technology. The course is designed for the students to develop a good understanding of the physical aspect of the technology necessary for them to evaluate and design fiber optic communication systems.

References:

1 Fiber-Optic Communications, 4th Ed, Gerd Keiser, McGraw- Hill, TK5103.59 .K44 2011, 2011.
2 Fiber-optic Communication Systems, G. P. Agrawal, John Wiley, TK5103.59 .A37 2002. 2002.
3 Fiber Optic Communications, 5th Ed, Joseph C. Palais, Prentice Hall, TK5103.59 .P34 2005, 2005
4 Optical Communications Essential, 3rd Ed, Gerd Keiser, McGraw-Hill, TK5103.59 .K44 2003, 2003.
5 Fiber-Optic Communications Technology, Djafar K. Mynbaev dan Lowell L. Scheiner, Prentice Hall, TK5103.59 .M96 2001,2001.
6 Fiber Optic Communications: Systems, Analysis, and Enhancements, Gerard Lachs, McGraw-Hill, TK5103.59 .L33 1998, 1998.
7 Optical Fiber Communication Systems, Leonid Kazovsky, Sergio Benedetto dan Alan Willner, Artech House, TK5103.59 .K39 1996, 1996.
8 Optical fiber telecommunications IV B: systems and impairments, Ivan P. Kaminov, Academic Press, TK5103.59 .O67 2002, 2002.

BEJ 41001 Communication Engineering Laboratory

Synopsis:

To give students practical experience in understanding the material presented in the following courses:
BEJ 31103 Electromagnetic Wave and Propagation, BEJ 41103 Digital Communication and BEJ 31202 Data Communication Network.

References:

1 Digital Communications – Fundamentals and Applications, 2nd Ed., B. Sklar, Prentice Hall, 2001. Call Number: TK5103.7.S55 2001
2 Communication Systems, 5th Ed., S. Haykin, John Wiley, NY, 2010. Call Number: TK5105.H374 2010.
3 Digital Communications, 4th Ed., J. G. Proakis, McGraw Hill, 2001. Call Number: TK5103.7.P76 2001 N5.
4 Introduction to Digital Communications, 2nd Ed., R. E. Ziemer & R. L. Peterson, Prentice Hall, 2001. Call Number: TK5103.7.Z53 2001
5 Digital Communications, I.A. Glover and P. M. Grant, Prentice Hall, London, 2010. Call Number: TK5103.7.G58 2010.
6 Modern Communication Systems (Principles and Applications), Leon W. Couch II, Prentice Hall, NJ, 1995. Call Number: TK5101.A3.C68 1995.

BEJ 41603 Antenna Theory and Applications

Synopsis:

This course covers topics such as antenna fundamentals including radiation pattern, far field, near field, gain, polarization, and impedance. A thorough analysis on basic antennas such as isotropic, short dipole, halfwave dipole, monopole and loop antenna. Analysis on arrays in terms of its pattern, mutual coupling, and array factor are also covered in detail. Students will also learn about many types of antenna available from resonant antenna, non-resonant antenna, and aperture antenna. Antenna synthesis methods such as the Fourier transform method, Woodward-Lawson Sampling, Dolph-Cherbyshev and Taylor Line Method will be investigated. Finally, techniques for antenna measurement will be discussed.

Pre-requisite: BEJ 31103 Electromagnetic Wave and Propagation

References:

1 Balanis, Constantine A, Antenna theory: Analysis and Design, (2016) 4th Ed. Hoboken, NJ: Wiley, 2016. Call Number: TK7871.6 .B34
2 John D. Kraus and Ronald J. Marhefka, Antennas and Wave Propagation, 5th Ed., Mc Graw Hill India; 2017. Call Number: TK7871.6 .S38
3 Saunders, S.R., Alejandro, A.Z., Antennas and Propagation for Wireless Communications, 2nd Ed., John Wiley, 2007. Call Number: TK7871.6 .S38 2007
4 Stutzman, W.L, Thiele, G.A., Antenna Theory and Design, 3rd Ed., John Wiley, 2012. Call Number: TK7874.6 .S78 1998
5 Elliott, R.S., Antenna Theory and Design, Rev Ed., John Wiley, 2003. Call Number: TK7871.6 .E44 2003

Elective Course I
(Communication Engineering)

BEJ 41403 Satellite Communication and Navigation

Synopsis:
The course aims to provide a comprehensive understanding on satellite communication especially on orbital mechanics, wave propagation, space link and navigation.

References:

1 Timothy Pratt, Jeremy E. Allnutt, Satellite Communications, John Wiley & Sons, 2019 TK5104 .P72
2 Roger Cochetti, Mobile Satellite Communication Handbook, John Wiley, 2015 TK5104 .C62
3 Dennis Roddy, Satellite Communications, 4th Ed., McGraw – Hill, 2006. Call Number: TK 5104 .R63 2006.
4 G. Maral dan M. Bousquet, Satellite Communication System: Systems, Techniques and Technology, 4rd Ed, John Wiley, 2009. Call Number: TK 5104 .M37 2009.
5 Louis J. Ippolito, Satellite Communications Systems engineering: atmospheric effects, satellite link design and system performance, John Wiley, 2008. Call Number: TK 5104 .I66 2008.
6 Jules E. Kadish dan Thomas W. R. East, Satellite Communication Fundamentals, Artech House, 2000. Call Number: TK 5104 .K32 2000 N1
7 M. Richharia, Satellite Communication Systems, 2nd Ed., McGraw-Hill, 1999.
8 G. Evans, Satellite Communication Systems, 3rd Ed., IEE, 1999. Call Number: TK5104 .S37 1999.
9 W. L. Pritchard, Satellite Communication Systems Engineering, 2nd Ed, Prentice-Hall, 1993.

BEJ 41503 Wireless Sensor and Mobile Ad-Hoc Network

Synopsis:
This course aims to provide a comprehensive knowledge of mobile ad-hoc networks (MANETs) and wireless sensor networks (WSNs) in terms of fundamental communication protocols and architecture concepts, common system applications, connectivity and routing strategies, network transmission interference, transmission power and energy management techniques.

References:

1 O.K.Tonguz, and G. Ferrari, Adhoc Wireless Networks, 1st Ed, Wiley, 2006. Call Number: TK5103.2.T66 2006.
2 K. Holger and W. Andreas, Protocols and Architectures for Wireless Sensor Networks, 1 st Ed, Wiley 2005. Call Number: TK7872.D48.K37 2005.
3 M. Ilyas and I.Mahgoub, Handbook of Sensor Networks: Compact Wireless and Wired Sensing Systems, 1st Ed., CRC Press 2005. Call Number: TK7872.D48.H36 2005.

BEJ 41903 Fundamental of 5G Communication: Modulation, Multiplexing & Network Slicing

Synopsis:
This course provides a comprehensive introduction to the key concepts and technologies underpinning 5G communication systems. It covers the fundamentals of signal processing, including analog and digital signal modelling, and progresses to advanced topics such as 5G signal characteristics and network slicing.

References:

1 5G NR Waveform Generation – MATLAB & Simulink. 5G NR Waveform Generation. Retrieved September 30, 2024, from https://www.mathworks.com/help/5g/gs/5g-nr-waveform-generation.html

2 Ramjee Prasad. 2014. 5G: 2020 and Beyond. Vol. First edition. River Publishers Series in Communications. Gistrup, Denmark: River Publishers. https://search-ebscohost-com.ezproxy.uthm.edu.my/login.aspx?direct=true&db=nlebk&AN=1941030&site=ehost-live&scope=site.

3 Pendli, Pavan Kumar, and Helena Friesen. 2014. Contribution of Modelling and Analysis of Wireless Communication for Safety Related Systems with Bluetooth Technology. Kassel, Germany: Kassel University Press GmbH_Legacy. https://search-ebscohost-com.ezproxy.uthm.edu.my/login.aspx?direct=true&db=nlebk&AN=881737&site=ehost-live&scope=site.

4 Joseph Boccuzzi. 2008. Signal Processing for Wireless Communications. McGraw Hill Professional. New York: McGraw-Hill Education. https://search-ebscohost-com.ezproxy.uthm.edu.my/login.aspx?direct=true&db=nlebk&AN=218908&site=ehost-live&scope=site.

5 Lee, Tong S. 2007. Wireless Communications Research Trends. New York: Nova Science Publishers, Inc. https://search-ebscohost-com.ezproxy.uthm.edu.my/login.aspx?direct=true&db=nlebk&AN=248706&site=ehost-live&scope=site

BEJ 41703 Electromagnetic Compatibility

Synopsis:

The course will initially introduce the importance of EMC and why it is required for electronic equipment. The aspects of EMC namely emission and immunity will then be introduced. The sources of radiated emission will be explained in detail followed by radiated immunity. Conducted emission and conducted immunity will then be introduced. The concept of grounding, shielding, and filtering to achieve EMC compliance will be given before the final topic on system design for EMC.

Pre-requisite: BEJ 31103 Electromagnetic Wave and Propagation

References:

1 H.W.Ott, Electromagnetic Compatibility Engineering, John Wiley and Sons, New Jersey, 2009. Call Number: TK7867.5.O867 2009.

2 R. Paul, Introduction to Electromagnetic Compatibility, 2nd Ed, John Wiley Interscience, New Jersey, 2006. Call number: TK7867.5.P38 2006.

3 S. M. Wentworth, Fundamentals of Electromagnetics with Engineering Applications, John Wiley and Sons, New Jersey, 2005. Call number: TK146.W46 2005.

4 C.A Balanis, Antenna Theory: Analysis and Design, 3rd Edition, John Wiley and Sons, New Jersey, 2005. Call number: TK7871.6.B34 2005.

5 V. P. Kodali, Engineering Electromagnetic Compatibility (Principles, Measurements Technologies and Computer Models), 2nd Ed., IEEE Press, New York, 2001. Call number: TK7867.5.K62 2001 N1.

Synopsis of Specialisation Courses
(Computer Engineering)

BEJ 20902 Object-Oriented Programming

Synopsis:
This course will provide students with object-oriented programming concepts, knowledge and practice. These include the objects, classes, pointers, inheritance, polymorphism, encapsulation and abstraction. The students will also learn about advanced features and software development for electronic engineering applications.

References:

1 Malhotra, D., and N. Malhotra. C++ Programming Fundamentals, Mercury Learning & Information, 2023. ProQuest Ebook Central, https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=30302590.
2 Hardin, Therese, et al. Concepts and Semantics of Programming Languages 2 : Modular and Object-Oriented Constructs with OCaml, Python, C++, Ada and Java, John Wiley & Sons, Incorporated, 2021. ProQuest Ebook Central, https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=6690677.
3 Goran Svenk. (2003) Object-oriented programming : using C++ for engineering and technology / Australia : Delmar/Thomson Learning, Call number: QA76.64 .S93 2003
4 Steven F. Lott, & Dusty Phillips. (2021). Python Object-Oriented Programming : Build robust and maintainable object-oriented Python applications and libraries. Packt Publishing.
5 Parker, James R. (2021). Python – An Introduction to Programming (2nd Edition). Mercury Learning and Information. Retrieved from https://app.knovel.com/hotlink/toc/id:kpPAIPE002/python-an-introduction

BEE 40401 Electronics Engineering Laboratory IV

Synopsis:
This course is intended to introduce the practical of microprocessor and computer organization with 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 it 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 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 techniques will be introduced to create a skill in the prototype product aspect.
3 PLC will be used to provide the programming knowledge for the controlling of the basic and advanced 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 30903 AIOT System Engineering

Synopsis:

Artificial intelligence (AI) and Internet of Things (IoT) systems are two essential components in the future's modern digital electronic system. The combination of the systems integrates AI algorithm, IoT device node circuit and cloud computing technology. In this course students will be exposed to these technologies where they need to understand how to design, develop and analyze these systems using either simulation tools or hardware.

References:

1 John Soldatos. 2016. Building Blocks for IoT Analytics Internet-of-Things Analytics. River Publishers Series in Signal, Image and Speech Processing Ser. Aalborg: River Publishers. https://search-ebscohost-com.ezproxy.uthm.edu.my/login.aspx?direct=true&db=nlebk&AN=1800554&site=ehost-live&scope=site.
2 Rute C. Sofia, and John Soldatos. 2023. Shaping the Future of IoT with Edge Intelligence : How Edge Computing Enables the Next Generation of IoT Applications. River Publishers Series in Communications and Networking. Gistrup: River Publishers. https://search-ebscohost-com.ezproxy.uthm.edu.my/login.aspx?direct=true&db=nlebk&AN=3729113&site=ehost-live&scope=site.
3 Ovidiu Vermesan, and Peter Friess. 2016. Digitising the Industry Internet of Things Connecting the Physical, Digital and VirtualWorlds. River Publishers Series in Communications. Gistrup, Denmark: River Publishers. https://search-ebscohost-com.ezproxy.uthm.edu.my/login.aspx?direct=true&db=nlebk&AN=1800544&site=ehost-live&scope=site.
4 Marcus Handte, Pedro José Marrón, Gregor Schiele, and Matoses Manuel Serrano. 2019. Adaptive Middleware for the Internet of Things : The GAMBAS Approach. River Publishers Series in Communications. Gistrup, Denmark: River Publishers. https://search-ebscohost-com.ezproxy.uthm.edu.my/login.aspx?direct=true&db=nlebk&AN=2249738&site=ehost-live&scope=site.

BEJ 30503 Digital Design

Synopsis:

This course introduces students to digital logic design, progressing from basic combinational and sequential logic to advanced topics 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.

References:

1 Intel, "Intel University Program (Digital Logic)", Intel FPGA documentation (2021): https://fpgacademy.org/courses.html"
2 Stephen Brown and Z. Vrasenic, "Fundamental of Digital Logic with Verilog Design", McGraw-Hill Higher Education, (2014): TK7868.L6 .B76 2014
3 Sarah L. Harris, David Haris, "Digital Design and Computer Architecture: From Gates to Processors", Elsevier Science & Technology (2007): TK7868.D5H34 2007
4 Sarah L. Harris, David Haris, Digital Design and Computer Architecture: RISC-V Edition", Elsevier Science & Technology (2021)
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 32103 Data Structures and Algorithm

Synopsis:

This course provides concepts of object oriented programming and comprehensive study on data structures and their associated algorithms. Basic data structures such as lists, stacks, queues, and trees, will be studied. Techniques which use recursion and pointer variables are included and various searching and sorting methods are introduced. Intuitive understanding of the complexity of these algorithms will also be developed.

References:

1 Mark Allen Weiss, “Data Structures and Algorithm Analysis in C++”, 3rd Edition, Addison Wesley, 2006. Call Number: QA76.73.C153 .W44 2006.
2 Micheal T. Goodrich, Roberto Tamassia and David M. Mount, “Data Structures and Algorithms in C++”, John Wiley & Sons, 2011. Call number: QA76.73.C153 .G66 2011.
3 Michael T. Goodrich, Roberto Tamassia, “Data Structures and Algorithms in Java”. John Wiley, 2010. Call number: QA76.73.J38 .G66 2010.
4 D.S. Malik. “C++ Programming: Program Design including Data Structures”, Course Technology/Cengage Learning, 2011. Call number: QA76.73.C153 .M34 2011.
5 Michael McMillan, “Data Structures and Algorithms using C#”, Cambridge University Press, 2007. Call Number: QA76.73.C154 .M54 2007.

BEJ 32202 Operating Systems

Synopsis:

This course is intended to provide a clear description of the operating system concept from fundamental to intermediate level. Topic covered; Introduction to operating system, process and scheduling, memory management, hardware management, file management, security and on the most recent operating system technologies.

References:

1 Bong Chin Wei, Ida M.Flynn, Ann Mciver Mchoes, Introduction to Operating Systems, Singapore: Cengage Learning, 2009. Call number: QA76.76.O63 .B66 2009.
2 Achyut S. Godbole, AtulKahate, Operating Systems, New Delhi: Tata McGraw-Hill, 2011, Call number: QA76.76 .O63 .G62 2011.
3 W. Stalling, Operating Systems: Internals & Design Principles, 7th Ed., Pearson Education International, 2012. Call number: QA76.76.O63.S74 2012.

BEJ 42103 Computer Networks

Synopsis:

This course provides a comprehensive understanding on computer networks regarding principles of networking, networking protocols, networking technologies and managing a secure and reliable network. Explanation of each element within the 7 OSI layer will be covered in detail using a top down approach. An in-depth look into security and network management will integrate the theory with existing network configurations.

References:

1 M. Barry Dumas, Morris Schwartz, “Principles of computer networks and communications”, Upper Saddle River, NJ: Prentice Hall, 2009. Call Number: TK5105.5 .D85 2009.
2 James F. Kurose and Keith W. Ross, “Computer Networking, A Top-Down Approach”, 4th Edition, Addison Wesley, 2008. Call Number: TK5105.875.I57 .K87 2008.
3 William Stallings, “Cryptography and Network Security: principles and practices”, 4th Edition, Prentice Hall, 2006. Call Number: TK5105.59 .S73 2006.
4 Fred Halsall, “Computer Networking and the Internet”, 4th Edition, Pearson Education, 2005. Call Number: TK5105.5 .H35 2005.
5 William Stallings, “Computer Networking with Internet Protocols and Technology”, 1st Edition. Pearson Education, 2004. Call Number: TK5105.5 .S72 2004.
6 Andrew S. Tanenbaum, Computer Networks, 5th Edition, Boston: Pearson Prentice Hall, 2011. Call Number: TK5105.5 .T36 2011.

BEJ 42203 Embedded Systems Design

Synopsis:

This course introduces the architecture and design of embedded systems by focusing on the knowledge and skills covering hardware and software development. Topics include embedded platforms and design tools, co-design methodology, RTOS, serial and high-speed interfaces, system integration and testing and debugging techniques. Recent trends in embedded systems are also discussed to provide basic understanding for further exploration.

References:

1 Arnold S. Burger (2020). Debugging Embedded And Real-Time Systems. Newnes, Oxford. Online: https://www.sciencedirect.com/book/9780128178119/debugging-embedded-and-real-time-systems
2 Xiaocong Fan (2015). Real-Time Embedded Systems. Newnes, Oxford. Online: https://www.sciencedirect.com/book/9780128015070/real-time-embedded-systems
3 Tammy Noergaard (2013). Embedded Systems Architecture. Newnes, Oxford. Online: https://www.sciencedirect.com/book/9780123821966/embedded-systems-architecture
4 Rob Toulson Et. Al (2024). Fast And Effective Embedded Systems Design (3rd Edition). Newnes, Oxford. Online: https://www.sciencedirect.com/book/9780323951975/fast-and-effective-embedded-systems-design
5 Mark Siegesmund (2015). Embedded C Programming. Newnes, Oxford. Online: https://www.sciencedirect.com/book/9780128013144/embedded-c-programming

BEJ 42303 Software Engineering

Synopsis:

The course familiarises students with concepts of software engineering. A broad view of software engineering approaches will be presented, focusing on engineering requirements issues, interactive systems and user interface design. Students will learn the issues involved in large-scale software development, the software life-cycle and its stages, CASE tools, object-oriented design and analysis, interactive systems design and software maintenance.

References:

1 Pressman, Roger S (2015). Software Engineering: A Practitioner’s Approach. Call Number: QA76.758. P73 2015
2 Tsui, Frank F. (2014). Essentials of Software Engineering. Call Number: QA76.758. T78 2014
3 Laplante, Phillip A. (2014). Requirements Engineering for Software and Systems. Call Number: QA76.758. L364 2014
4 Saleh, Kassem A. (2009). Software Engineering Call Number: QA76.758. S24 2009
5 Sommerville, Ian (2007). Software Engineering Call Number: QA76.758. S65 2007]

BEJ 42001 Computer Engineering Laboratory

Synopsis:

In this course students will be exposed to a number of experiments in implementing the theory learnt in Computer Networks and Embedded Systems Design courses. The topics include designing, simulating and/or prototyping systems and analysing performances.

References:

1 James F. Kurose and Keith W. Ross, “Computer Networking, a Top-Down Approach”, 5th Edition, Addison Wesley, 2009. Call Number: TK5105.875.I57 .K87 2008
2 William Stallings, “Cryptography and Network Security”, 5th Edition, Prentice Hall, 2011. Call Number: TK5105.59 .S73 2011
3 Fred Halsall, “Computer Networking and the Internet”, 4th Edition, Addison Wesley, 2005. Call Number: TK5105.5 .H35 2005
4 William Stallings, “Computer Networking with Internet Protocols and Technology”, 1st Edition. Prentice Hall, 2004. Call Number: TK5105.5 .S72 2004
5 Tammy Noergaard, Embedded systems architecture: a comprehensive guide for engineers and programmers, Oxford: Newnes, 2013. Call Number: TK7895.E42 .N63 2013
6 Ron Sass, Embedded systems design with platform FPGAs: principles and practices, Boston: Morgan Kaufmann, 2010. Call Number: TK7895.E42 .S27 2010

BEJ 42113 Database System

Synopsis:

This course provides comprehensive database concepts through the use of database design models and implementations using SQL. After completing this course, student should be able to design, develop, test and manipulate the database based on technical or real engineering problems

References:

1 Connoly, T. & Begg, C., 2015. Database system: a practical approach to design, implementation and management. 6th ed. Harlow, UK: Addison-Wesley. Call number: QA76.9.D26 .C66 2015
2 Carlos Coronel, Steven Morris, Peter Rob. 2013. Database systems : design, implementation, and management. 10th ed. Boston, MA: Course Technology/Cengage Learning. Call number : QA76.9.D26.C67 2013
3 Gupta, G.K, 2011. Database management System, New Delhi, Tata Mc Grawhill. QA76.9.D3 .G87 2011
4 Bhatia, Ashima BhatnagarBhatia, Ashima Bhatnagar, 2014. Database management System.1st Edition. https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=5218421&query=database%20management%20system
5 Silberschatz, A., Korth, H. & Sudarshan, S., 2011. Database system concepts. 6th ed. New York: McGraw-Hill. Call number: QA76.9.D3 .K69 2011.

Elective Course I
(Computer Engineering)

BEJ 42403 Computer System Engineering

Synopsis:
The course covers advanced topics of computer architecture from what the students have learned in previous computer architecture and organization courses. In particular, this course discusses various aspects of multicore technology including architecture, parallel programming, memory consistency and coherency, and synchronization. GPU architecture is also discussed by introducing CUDA programming for practical understanding. Lastly, distributed systems topic is introduced to further understand the parallel processing at computer networking level.

References:

1 Cook, Shane, CUDA Programming: A Developer's Guides to Parallel Computing with GPUs, Elsevier, 2013. Call number: QA76.642.C66 2013.
2 Jean-Loup Baer, Microprocessor architecture: from simple pipelines to chip multiprocessors, New York: Cambridge University Press, 2010. Call Number: QA76.5 .B33 2010.
3 Abderazek, Ben Abadallah, Multicore System on Chip: Practical software/hardware design, Atlantic Press: World Scientific, 2010. Call number: TK7895.A22 2010.
4 Kornaros, Georgios, Multi-core Embedded Systems, CRC Press/Taylor & Francis, 2010. Call number: TK7895.E42.M84 2010.
5 Coulouris, George, Distributed systems: concepts and design, Addison-Wesley, 2005. Call number: QA76.9.D5 .C68 2005.
6 Dally, William James, Principles and Practices of Interconnection Networks, Elsevier, 2004. Call number: TK5105.5.D34 2004.

BEJ 42503 Advanced Microcontroller

Synopsis:
This course intends to augment students' understanding on microcontrollers by exploring advanced microcontroller features. The students will develop in-depth understanding on microcontroller architecture, the software interface and programming, advanced microcontroller features, and object-oriented design environment which are vital for numerous embedded system applications.

References:

1 Yiu, Joseph (2011). The definitive guide to the ARM Cortex-M0. London: Newnes. Call number: TK7895.E42. Y584 2011
2 Yiu, Joseph. (2014). The definitive guide to ARM Cortex-M3 and Cortex-M4 processors. Amsterdam: Elsevier. Call number: QA76.5. Y585 2014
3 Toulson, Rob (2012). Fast and effective embedded systems design: applying the ARM mbed. Boston, MA: Elsevier. Call number: TK7895.E42. T68 2012
4 Andrews, Jason R. (2005). Co-verification of hardware and software for ARM SoC design. Amsterdam: Elsevier. Call number: TK7874 .A54 2005

BEJ 42123 CMOS VLSI Design

Synopsis:
This course provides an in-depth introduction to the design and implementation of Very Large Scale Integration (VLSI) circuits. It covers fundamental concepts of MOS transistor theory, CMOS logic design, and physical layout principles. Students will explore the entire VLSI design flow, from high-level behavioral design to physical layout and verification, utilizing industry-standard tools and methodologies.

References:

1 Cherry Bhargava and Gaurav Mani Khanal. "Advanced VLSI Technology: Technical Questions with Solutions", River Publishers (2020): TK7874 .B437 2020
2 Ming-Bo Lin. "Introduction to VLSI Systems: A Logic, Circuit, and System Perspective", Taylor & Francis Group (2011): TK7874.75 .L56 2015
3 John E. Ayers. "Digital Integrated Circuits: Analysis and Design, Second Edition", Taylor & Francis Group (2009): TK7874.65 .A94 2010
4 Angsuman Sarkar et.al. "Low Power VLSI Design: Fundamentals", Walter de Gruyter GmbH (2016): TK8984.75.L69 2016eb

BEJ 42703 Computer Security

Synopsis:

The course familiarises students with the concepts of computer security. The course covers principles of computer systems security, various attack techniques and how to defend against them. Topics include cryptography, network security practice, and system security.

References:

1 William Stallings, Computer Security: Principles and Practice 3rd Edition, Boston: Pearson, 2015. Call Number : QA76.9.A25 .S74 2015
2 William Stallings, Cryptography and Network Security: Principles and Practice, 7th Edition, Prentice Hall, 2011. Call Number: TK5105.59 .S72 2017
3 Mark Ciampa, CompTIA Security+ Guide to Network Security Fundamentals, Australia: Cengage Learning, 2018. Call Number : TK5105.59 .C525 2018
4 Randall J. Boyle, Corporate Computer Security, Boston: Pearson, 2015. Call Number : QA76.9.A25 .B691 2015
5 Mark Ciampa, Security awareness: Applying Practical Security in your World. Boston, MA: Course Technology, 2014. Call Number : TK5105.59 .C52 2014

BEJ 42803 Artificial Intelligence

Synopsis:

This course is intended to provide students with different theories of artificial intelligence (AI). A variety of approaches with general applicability will be developed. These include knowledge representation formalisms, search techniques and the ultimate tools used in most AI systems. In addition to these topics, specific domains such as rule based systems, natural language processing and machine learning will be addressed.

References:

1 Rich, E and Knight K and S B. Nair, Artificial Intelligence. 3rd Edition. McGraw-Hill Edu. 2008. Call Number: HD30.2 .R52 2008.
2 Negnevitsky, M. Artificial Intelligence: A Guide to Intelligent Systems. 3nd Edition. Pearson Education Limited, 2011.Call Number: QA76.76.E95 .N43 2011
3 M. Tim Jones. Artificial intelligence: A systems approach. Infinity Science, 2008. Call Number: Q336 .J664 2008.
4 Gorge F. Luger. Artificial Intelligence: Structures and Strategies for Complex Problem Solving. 6th Edition, Addison Wesley. 2009. Call Number: Q335 .L84 2009.
5 Christopher M.Bishop. Pattern Recognition and Machine Learning. New York: Springer. 2006. Call Number: Q327.B57 2006.

BEJ 42903 Image Processing

Synopsis:

This course is intended to provide fundamental concepts of digital images and image processing algorithms. Areas covered include intensity transformations, linear and non-linear spatial filtering, filtering in frequency domain, image restoration & reconstruction, image compression, morphological image processing and image segmentation.

References:

1 Rafael C Gonzalez and Richard E Woods (2018). Digital Image Processing, Pearson. ISBN-13: 9781292223049.
2 Alasdair McAndrew (2015). A Computational Introduction to Digital Image Processing. CRC. ISBN-13: 978-1482247329
3 P K Thiruvikraman (2019). A Course on Digital Image Processing with MATLAB. IOPSCIENCE. Online ISBN: 978-0-7503-2604-9.
4 Arsath Natheem (2017). Digital Image Processing using MATLAB: ZERO to HERO Practical Approach with Source Code (Handbook of Digital Image Processing using MATLAB). ISBN-13: 978-1973565154.
5 Manas Kamal Bhuyan (2019). Computer Vision and Image Processing: Fundamentals and Applications. CRC Press. ISBN 9780815370840.

Synopsis of Specialisation Courses
(Medical Electronic Engineering)

BEJ 20902 Object-Oriented Programming

Synopsis:
This course will provide students with object-oriented programming concepts, knowledge and practice. These include the objects, classes, pointers, inheritance, polymorphism, encapsulation and abstraction. The students will also learn about advanced features and software development for electronic engineering applications.

References:

1 Malhotra, D., and N. Malhotra. C++ Programming Fundamentals, Mercury Learning & Information, 2023. ProQuest Ebook Central, https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=30302590.
2 Hardin, Therese, et al. Concepts and Semantics of Programming Languages 2 : Modular and Object-Oriented Constructs with OCaml, Python, C++, Ada and Java, John Wiley & Sons, Incorporated, 2021. ProQuest Ebook Central, https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=6690677.
3 Goran Svenk. (2003) Object-oriented programming : using C++ for engineering and technology / Australia : Delmar/Thomson Learning, Call number: QA76.64 .S93 2003
4 Steven F. Lott, & Dusty Phillips. (2021). Python Object-Oriented Programming : Build robust and maintainable object-oriented Python applications and libraries. Packt Publishing.
5 Parker, James R. (2021). Python – An Introduction to Programming (2nd Edition). Mercury Learning and Information. Retrieved from https://app.knovel.com/hotlink/toc/id:kpPAIPE002/python-an-introduction

BEE 40401 Electronics Engineering Laboratory IV

Synopsis:
This course is intended to introduce the practical of microprocessor and computer organization with 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 it 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 30903 AIOT System Engineering

Synopsis:
Artificial intelligence (AI) and Internet of Things (IoT) systems are two essential components in the future's modern digital electronic system. The combination of the systems integrates AI algorithm, IoT device node circuit and cloud computing technology. In this course students will be exposed to these technologies where they need to understand how to design, develop and analyze these systems using either simulation tools or hardware.

References:

1 John Soldatos. 2016. Building Blocks for IoT Analytics Internet-of-Things Analytics. River Publishers Series in Signal, Image and Speech Processing Ser. Aalborg: River Publishers. https://search-ebscohost-com.ezproxy.uthm.edu.my/login.aspx?direct=true&db=nlebk&AN=1800554&site=ehost-live&scope=site.

2 Rute C. Sofia, and John Soldatos. 2023. Shaping the Future of IoT with Edge Intelligence : How Edge Computing Enables the Next Generation of IoT Applications. River Publishers Series in Communications and Networking. Gistrup: River Publishers. https://search-ebscohost-com.ezproxy.uthm.edu.my/login.aspx?direct=true&db=nlebk&AN=3729113&site=ehost-live&scope=site.

3 Ovidiu Vermesan, and Peter Friess. 2016. Digitising the Industry Internet of Things Connecting the Physical, Digital and VirtualWorlds. River Publishers Series in Communications. Gistrup, Denmark: River Publishers. https://search-ebscohost-com.ezproxy.uthm.edu.my/login.aspx?direct=true&db=nlebk&AN=1800544&site=ehost-live&scope=site.

4 Marcus Handte, Pedro José Marrón, Gregor Schiele, and Matoses Manuel Serrano. 2019. Adaptive Middleware for the Internet of Things : The GAMBAS Approach. River Publishers Series in Communications. Gistrup, Denmark: River Publishers. https://search-ebscohost-com.ezproxy.uthm.edu.my/login.aspx?direct=true&db=nlebk&AN=2249738&site=ehost-live&scope=site.

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 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 techniques will be introduced to create a skill in prototype product aspect.

3 PLC will be used to provide the programming knowledge for the controlling of the basic and advanced 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 45703 Biomedical Engineering and Applications

Synopsis:

This course provides a comprehensive overview of biomedical engineering, focusing on key areas such as biomedical signals, devices, computational modeling, artificial intelligence, and biomechanics. The syllabus covers the acquisition and processing of bioelectric signals like ECG and EEG, the design and application of biosensors and wearable health monitoring devices, and the use of computational tools and AI for diagnostics and predictive analytics. Students explore biomedical system modeling and the ethical challenges surrounding AI-driven technologies. The course also introduces basic biomechanics, emphasizing tissue mechanics, human motion, and prosthetic design. With a strong focus on practical skills and real-world case studies, the course equips students to apply biomedical engineering principles responsibly in healthcare innovation.

References:

1 Kutz, Myer, ed. (2021). Biomedical Engineering Fundamentals 3rd Ed. New York: McGraw Hill. https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781260136265
2 Vandana Patel, Ankit K. Shah (2021). Chapter 3 - Machine learning for biomedical signal processing.(pp. 47-66) Elsevier. https://www.sciencedirect.com/science/article/pii/B9780128212295000021
3 Amirouche, Farid, Doyle Knight, Yiannis Andreopoulos, Paul V. Cavallaro, Ali M. Sadegh, Srirangam Kumaresan, And Anthony Sances Jr. 2018. “Introduction To Biomechanics.” Chap. 12.6 in Marks' Standard Handbook for Mechanical Engineers. 12th ed., edited by Ali M. Sadegh and William M. Worek. New York: McGraw-Hill Education. https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781259588501/toc-chapter/chapter12/section/section107
4 Khandpur, R. S. 2014. “Fundamentals of Medical Instrumentation.” Chap. 1 in Handbook Of Biomedical Instrumentation. 3rd ed. New York: McGraw Hill Education (India) Private Limited. https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9789339205430/chapter/chapter1
5 Meurs, Willem van. 2011. “Mathematical Models.” Chap. 4 in Modeling and Simulation in Biomedical Engineering: Applications in Cardiorespiratory Physiology. 1st ed. New York: McGraw-Hill Education. https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9780071714457/chapter/chapter4

BEJ 35103 Human Physiology

Synopsis:
This course deals with human anatomy and physiology concentrating on the study of body structure and functions from individual cells to human organ systems.

References:

1 Stuart I. (2006). Human physiology. New York: McGraw-Hill. Call Number: QP34.5 .F69 2006.
2 Rodney A. Rhoades and Richard G. Pflanzer (2003). Human Physiology. Victoria: Thomson Learning. Call Number: Call Number: QP36 .R46 2003.
3 Lauralee Sherwood (2001). Human Physiology: From Cells to Systems. Pacific Grove, Calif.: Brooks/Cole. Call Number: QP34.5 .S48 2001 N2.
4 Arthur J. Vander, James Sherman and Dorothy Luciano (2001). Human Physiology: The Mechanisms of BodyFunction. Boston: McGraw-Hill. Call Number: QP34.5 .V36 2001 N1.
5 Bonnie F. Fremgen (2002). Medical Terminology: An Anatomy and Physiology Systems Approach. Upper Saddle River, NJ: Pearson. Call Number: R123 .F73 2002.

BEJ 35202 Medical Equipment Management and Safety

Synopsis:
In this course, students will be lectured on safety and management issues specifically on medical equipment which are essential for a medical electronics graduate since the devices which they will be working with are mostly interfaced with the human body. Therefore, the following items will be covered during this subject such as biomedical engineering services, clinical engineering, medical informatics, ethical issues associated with the use of medical technology, compatibility and standards, quality assurance and safety procedure in working conditions.

References:

1 Bertil Jacobson, Alan Murray (2007). Medical devices: use and safety. New York: Churchill Livingstone. Call number: R856 .J32 2007.
2 Thomas A. Mappes, David DeGrazia (2001). Biomedical ethics. Boston: Mc Graw-Hill. Call number: R724 .B56 2001.
3 Theodore R. Kucklick (2006). The medical device R D. handbook. Boca Raton, FL: Taylor and Francis. Call number: R856.15 .K83 2006.
4 Raymond McLeod, Jr., George Schell (2007). Management information systems, Upper Saddle River, NJ: Prentice Hall. Call number: T58.6 .M34 2007.
5 David L. Goetsch (2000). The safety and health handbook, New Jersey: Prentice-Hall. Call number: RC967 .G63 2000.

BEJ 45001 Medical Electronics Engineering Laboratory

Synopsis:
To give students practical experience in understanding the topics covered in the following courses: 1. Principle of Physiological Devices BEJ45203 2. Medical Instrumentation BEJ45303.

References:

1 Street Laurence (2012). Introduction to Biomedical Engineering Technology. Boca Raton: CRC Press. Call number: R856 .S77 2012
2 Alexander Burdenko (2013). Ultrasonography, Technology Diagnostic Applications and Potential Benefits/Risks. New York: Nova Science.
3 Ludmila N. Ivanova (2012). Circulatory System and Arterial Hypertension Experimental Investigation, Mathematical and Computer Simulation. New York: Nova Science.
4 E. Hassanzadeh et al., “Comparison of quantitative apparent diffusion coefficient parameters with prostate imaging reporting and data system V2 assessment for detection of clinically significant peripheral zone prostate cancer,” Abdom. Radiol. vol. 43, no. 5, pp. 1237–1244, May 2018.
5 M. Ghafoorian et al., “Transfer Learning for Domain Adaptation in MRI: Application in Brain Lesion Segmentation,” Feb. 2017.
6 William O. Tatum, Aatif m. Husain, Selim R. Benbadis Peter W. Kaplan (2008). Handbook of EEG Interpretation, Demos Medical Publishing 2008.
7 Laurence J. Street (2008). Introduction to biomedical engineering technology. Boca Raton, FL: CRC, 2008. Call Number: R856 .S77 2008
8 Jack M. Winters, Molly Follette Story (2007). Medical instrumentation: accessibility and usability considerations. Boca Raton, FL: Taylor & Francis, 2007. Call Number: R856.6 .M42 2007

BEJ 45103 Medical Imaging

Synopsis:
This course introduces medical imaging methods and application in diagnosis and recovery, X-Ray criteria, exposure estimation, law and attenuation coefficient, image revolution, ultrasound imaging, radiography and tomography image classification, filtration, compensation and MRI.

References:

1 Nadine Barrie Smith and Andrew Webb (2011). Introduction to Medical Imaging: Physics, Engineering and Clinical Applications. Cambridge University Press. Call number: RC78.7.D53.W42 2011.
2 Andrew Webb (2003). Introduction to Biomedical Imaging.IEEE Press. Call number: R857.O6.W42 2003.
3 Paul Suetens (2002). Fundamentals of Medical Imaging. Cambridge University Press. Call number: RC78.7.D53 .S83 2002 n.1.
4 RF Farr and PJ Allisy-Roberts. Physics for Medical Imaging. Sauders. Call number: RC78.7.D53.F37 2001 n.1.
5 Oge Marques (2011). Practical Image and Video Processing Using MATLAB. IEEE Press. Call number: TA1637.M42 2011.
6 John L. Semmlow (2004). Biosignal and Biomedical Image Processing. Marcel Dekker, Inc. Call number: R857.O6.S45 2004.

BEJ 45203 Principle of Physiological Devices

Synopsis:
This course discusses measurement techniques of electrical and non-electrical parameters, the principles and applications of biosensor, transducer and bioelectric amplifier, and medical devices design.

Pre-requisite: BEJ 35103 Human Physiology

References:

1 Khandpur Raghbir S. (2014). Handbook of Biomedical Instrumentation. New Delhi: McGraw Hill. Call number: R856.15 .K42 2014.
2 Jeong-Yeol Yoon (2013). Introduction to Biosensors: From Electric Circuits to Immunosensors. New York: Springer. Call number: R857.B54 .Y66 2013.
3 Corcoles Emma P. and Boutelle Martyn G. (2013). Biosensors and Invasive Monitoring in Clinical Applications. New York: Springer. Call number: R857.B54 .C67 2013.
4 Street Laurence (2012). Introduction to Biomedical Engineering Technology. Boca Raton: CRC Press. Call number: R856 .S77 2012.
5 Webster John G. (2010). Medical Instrumentation Application and Design. New York: John Wiley. Call number: R856 .M43 2010.
6 Chatterjee S. (2010). Biomedical instrumentation Systems. Clifton Park, NY: Delmar Cengage Learning. Call number: R856.15 .C42 2010.
7 King Paul H. and Fries Richard C. (2009). Design of Biomedical Devices and Systems. Boca Raton: CRC. Call number: R856 .K56 2009.
8 Khandpur Raghbir S. (2005). Biomedical Instrumentation: Technology and Application. New York: McGraw-Hill. Call number: R856.15 .K43 2005.

BEJ 45303 Medical Instrumentation

Synopsis:

This course introduces students to the non support services in Malaysia's hospital, safety standard for medical device and safety test, medical instrumentation and devices principle, operation and design, therapeutic devices and patient monitoring system.

Pre-requisite: BEJ 35202 Medical Equipment Management and Safety

References:

1 R. Splinter, B. A. Hooper (2007). An Introduction to Biomedical Optics. New York: Taylor & Francis. Call number: R857 .B54 .S64 2007.
2 Francis T. S. Yu, Xiangyang Yang (1997). Introduction to Optical Engineering. United Kingdom: Cambridge University Press. Call number: TA1750 .Y8 1997.
3 Guy Cox (2007). Optical Imaging Techniques in Cell Biology. Boca Raton, FL: Taylor & Francis. Call number: QH5812 .C69 2007.
4 Peter Torok, Fu-Jen Kao (2007). Optical Imaging and Microscopy: Techniques and Advanced Systems. Berlin: Springer, Call number: TA1750 .T67 2007.
5 Ahkram Aldroubi and Michael Unser (1996). Wavelets in Medicine and Biology. Boca Raton, FL: CRC Press. Call number: R53.M3 .W38 1996.

BEJ 45403 Telemedicine System and Applications

Synopsis:

This course introduces telemedicine in terms of the definition, origins and developments, types, drivers, benefits and limitations. This course also provides information on signal types and how to process and transmit them over the networks, types of the network that can be used as well as the integration and operational issues. Besides, an overview of the security and privacy in telemedicine will also be explored, including on threats, protective measures, ethical and legal issues in telemedicine. This course also offers students with knowledge on the current system including mobile health, HIS, EHR and CDSS. Finally, some telemedicine applications will be explored in terms of its trends and related issues.

References:

1 Catherine Barret, Alexis S. Gilroy (2015). What is…Telemedicine?.American Bars Association.
2 Joel J. P. C. Rodrigues, Isabel de la Torre Díez, Beatriz Sainz de Abajo (2012). Telemedicine and E-Health Services, Policies, and Applications: Advancements and Development, IGI Global Publishers.
3 Mar Manuela Cruz-Cunha Miranda (2016). Encyclopedia of E-health and Telemedicine, IGI Global Publishers.
4 Karen Schulder Rheuban, Elizabeth A. Krupinski (2018). Understanding Telehealth. McGraw-Hill Education.

Elective Course I
(Medical Electronic Engineering)

BEJ 45503 Biomedical Optics

Synopsis:
This course covers the principles of optical devices, which include reflection and refraction theories, lenses and aberrations. Students are also exposed to different types of optical systems including camera and endoscope (rigid and flexible), microscope, projection systems, photoconductive detectors, semiconductor photodiodes, PIN and avalanche photodiode, photomultiplier, charge coupled devices. This course also includes noise and sensitivity of electro-optic detectors, quantum behavior of light, spontaneous and stimulated emission in generation of lasing light, operating principle of laser, type of lasers, fiber optics technology and applications and optics in medical application.

References:

1 R. Splinter, B. A. Hooper (2007). An Introduction to Biomedical Optics. New York: Taylor & Francis. Call number: R857 .B54 .S64 2007.
2 Francis T. S. Yu, Xiangyang Yang (1997). Introduction to Optical Engineering. United Kingdom: Cambridge University Press. Call number: TA1750 .Y8 1997.
3 Guy Cox (2007). Optical Imaging Techniques in Cell Biology. Boca Raton, FL: Taylor & Francis. Call number: QH5812 .C69 2007.
4 Peter Torok, Fu-Jen Kao (2007). Optical Imaging and Microscopy: Techniques and Advanced Systems. Berlin: Springer, Call number: TA1750 .T67 2007.
5 Ahkram Aldroubi and Michael Unser (1996). Wavelets in Medicine and Biology. Boca Raton, FL: CRC Press. Call number: R53.M3 .W38 1996.

BEJ 45603 Biomaterial

Synopsis:
This course introduce students on biomaterials science and biocompatibility, introduction to structure and properties of biological tissues, polymers, metals and ceramics, introduction to methods for cellular and tissues analysis, investigate the microscopic and macroscopic structure of tissues, determine the physical structure and modeling, assembly of biological macromolecules and pathobiological response to implants.

References:

1 Williams, D. F. (2014). Essential biomaterials science. New York: Cambridge University Press. Call number: R857.M3. W54. 2014.
2 Ratner, Buddy D. (2013). Biomaterials science: an introduction to materials in medicine. Amsterdam: Elsevier, Academic Pr. 3rd.R857.M3 .B56 2013.
3 Park, John B. Bronzino. (2002). Joseph D., Biomaterials: principles and applications, Boca Raton, FL: CRC Press CRC Press. Call number: R857.M3. B56. 2002.
4 Dumitriu, Severian. (2013). Polymeric biomaterials Structure and function. 3rd ed. London: Taylor & Francis. R857.P6 .D85 2013.
5 Vladkova, Todorka G. (2012) Surface engineering of polymeric biomaterials. London: Smithers Rapra. R857.P6 .V52. 2012.

BEJ 45803 Rehabilitation System Engineering

Synopsis:
This course introduces the rehabilitation technologies, factor development in rehabilitation engineering, assistive devices, and prostheses term terminology, sensorial prostheses of hearing, auditory system, hearing aids technologies, pacemakers technologies and system design using fuzzy logic, simulation of fuzzy pacemaker, robotic system in rehabilitation, software architectures in the IRL, Intelligent agent for human-robot interaction, computerised obstacle avoidance system, mobile robotics technologies and the guide cane.

References:

1 Teodorescu, Horia – Nicolai (2001). Intelligent Systems and Technologies in Rehabilitation Engineering. CRC Press. Call number: RM950. I57 2001 N1.
2 Bryant, Diane Pedrotty (2003). Assistive Technology for People with Disabilities. Allyn & Bacon. Call number: RM950. B79 2003.
3 Domach, Michael M. (2010). Introduction to Biomedical Engineering. Pearson. Call number: R856 .D65 2010.
4 Enderle, John D. (2005). Introduction to Biomedical Engineering, Elsevier. Call number: R856. I57 2005.
5 Dorf, Richard C. (2006). The Electrical Engineering Handbook: Sensors, Nanoscience, Biomedical Engineering and Instruments.Taylor and Francis. Call number: R857. B54. E43 2006 r.

BEJ 45903 BioMEMS and Medical Microdevices

Synopsis:

This course introduces the BioMEMS, lithography, etching method, thin film deposition, ion implantations, surface micromachining, polymer materials, electrokinetic phenomena, microvalves, micromixers, micropumps, basic sensors, optical sensors, piezoelectricity and SAW devices, electrochemical detection, activation methods, microactuators for microfluids, equivalent circuit representations and drug delivery system.

References:

1 Teodorescu, Horia – Nicolai (2001). Intelligent systems and technologies in rehabilitation engineering. CRC Press. Call number: Teodorescu, Horia - Nicolai.
2 Bryant, Diane Pedrotty (2003). Assistive technology for people with disabilities. Allyn & Bacon. Call number: RM950 .B79 2003.
3 Domach, Michael M. (2010). Introduction to biomedical engineering. Pearson. Call number: R856 .D65 2010.
4 Enderle, John D. (2005). Introduction to Biomedical Engineering, Elsevier. Call number: R856 .I57 2005.
5 Dorf, Richard C. (2006). The electrical engineering handbook: sensors, nanoscience, biomedical engineering and instruments. Taylor and Francis. Call number: R857.B54.E43 2006.

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

MEE 10103 Advanced Engineering Mathematics

Synopsis:
Root finding of nonlinear systems, 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 Calculator. 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 digital circuits using Programmable Logic Technology. Students will be exposed 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 detail about Diode Rectifiers, Thyristor-Based Rectifiers, DC to DC Converters, DC to AC Converters, AC to AC Converters in three phase systems. 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 technologists.

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:
Huawei 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 technologists.

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 basics 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 technologists.

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 maintenance. 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.

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 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, challenges 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

EWF 40103 Data Science and Applications

Synopsis:
In this course, students 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 others. Data visualisation tools such as Tableau and Microsoft Power BI provide an accessible way to see and understand trends, outliers, forecasts 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@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 the preparation of voluntary 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

There is perhaps no other career which spans as wide as the engineering field. The graduates from Bachelor of Electronic Engineering with Honours are privileged to explore the vast job opportunities in respective fields not only locally but also aiming at international level.

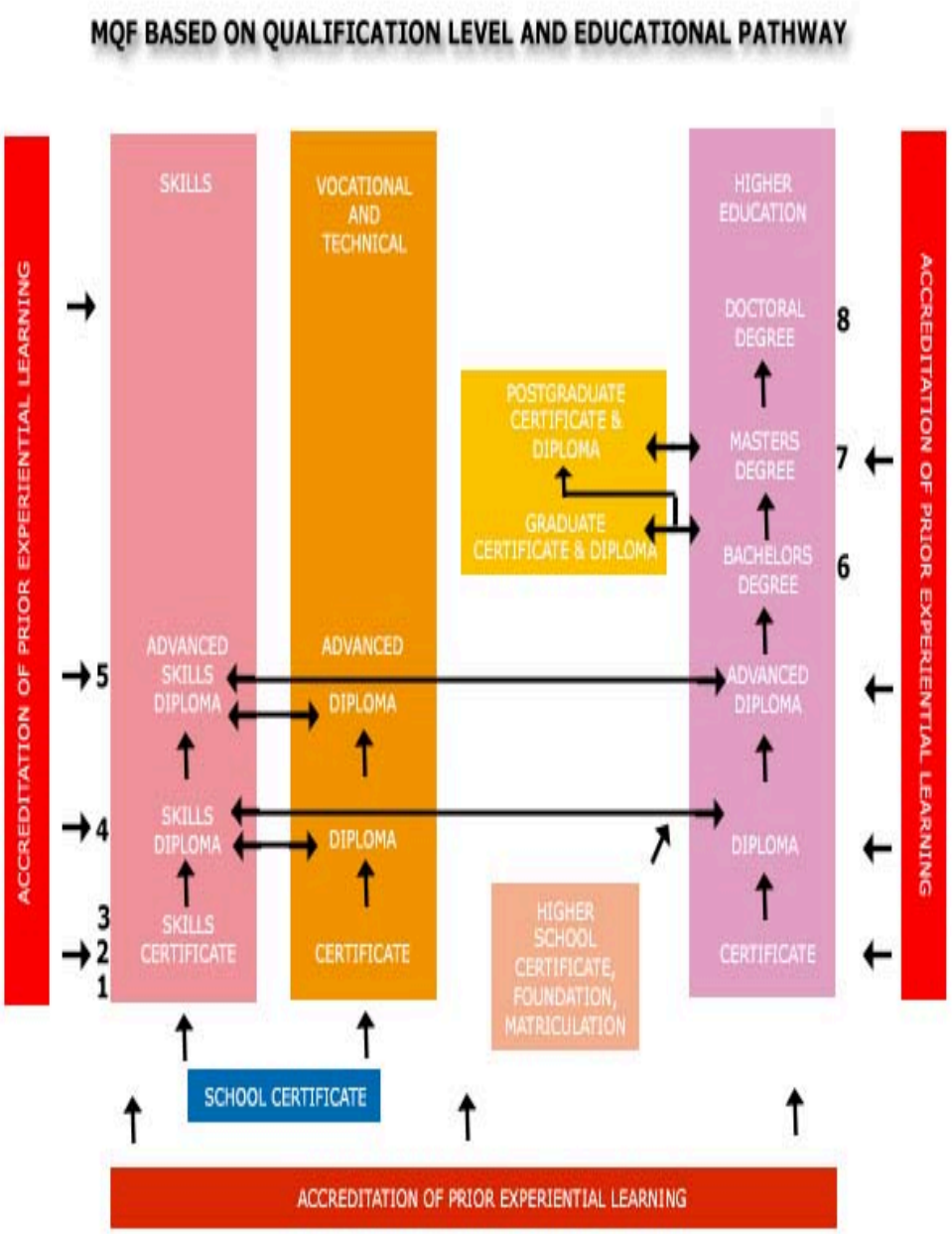
Electronic Engineering graduates play important roles in a wide range of sectors such as manufacturing, research, design, development, testing, installation, commissioning and maintenance of various systems.

Some of important engineering prospect will include Control and Instrumentation Engineer, Industrial Automation Engineer, Mechatronic Engineer, Design Engineer, Production Engineer, Project Engineer, Network Engineer, Communication Engineer, Sales Engineer, Fabrication Engineer, R&D Engineer, Test Engineer, Service Engineer, Manufacturing Engineer, Computer Engineer, Software Engineer, Computer Scientist, Network & Computer Administrator, Database Administrator, Computer System Analyst, Consultant, Academia, Entrepreneur.

Additionally, the 3 different specialisations (Computer, Communication and Medical Electronic) will greatly emphasise a targeted engineering field which offers more qualified engineers.

Nevertheless, the room for continuing studies is always available. It is also worthwhile to continue education that will open up more opportunities and boost career prospects. Graduates may pursue higher degrees by research (MEng, PhD, etc), or by teaching postgraduate programmes (MSc, MEng, MBA, etc).

Further Education Pathway



MALAYSIAN QUALIFICATIONS FRAMEWORK: QUALIFICATIONS AND LEVELS

<table>
<tr><th rowspan="2">MQF Levels</th><th colspan="3">Sectors</th><th rowspan="2">Lifelong Learning</th></tr>
<tr><th>Skills</th><th>Vocational and Technical</th><th>Higher Education</th></tr>
<tr><td>8</td><td rowspan="4" colspan="2"></td><td>Doctoral Degree</td><td rowspan="10">Accreditation of Prior Experiential Learning (APEL)</td></tr>
<tr><td rowspan="2">7</td><td>Masters Degree</td></tr>
<tr><td>Postgraduate Certificate & Diploma</td></tr>
<tr><td rowspan="2">6</td><td>Bachelors Degree</td></tr>
<tr><td>Graduate Certificate & Diploma</td></tr>
<tr><td>5</td><td>Advanced Diploma</td><td>Advanced Diploma</td><td>Advanced Diploma</td></tr>
<tr><td>4</td><td>Diploma</td><td>Diploma</td><td>Diploma</td></tr>
<tr><td>3</td><td>Skills Certificate 3</td><td rowspan="3">Vocational and Technical Certificate</td><td>Certificate</td></tr>
<tr><td>2</td><td>Skills Certificate 2</td><td rowspan="2"></td></tr>
<tr><td>1</td><td>Skills Certificate 1</td></tr>
</table>

Disclaimer:

This is a revised Faculty of Electrical and Electronic Engineering Proforma Bachelor of Electronic Engineering with Honours as of 15th September 2026 FKEE



Centre for Academic Development and Training
Universiti Tun Hussein Onn Malaysia
86400 Batu Pahat, Johor Darul Ta'zim
www.uthm.edu.my